Towards Sustainable China-MENA Relations in the Renewable Energy Sector

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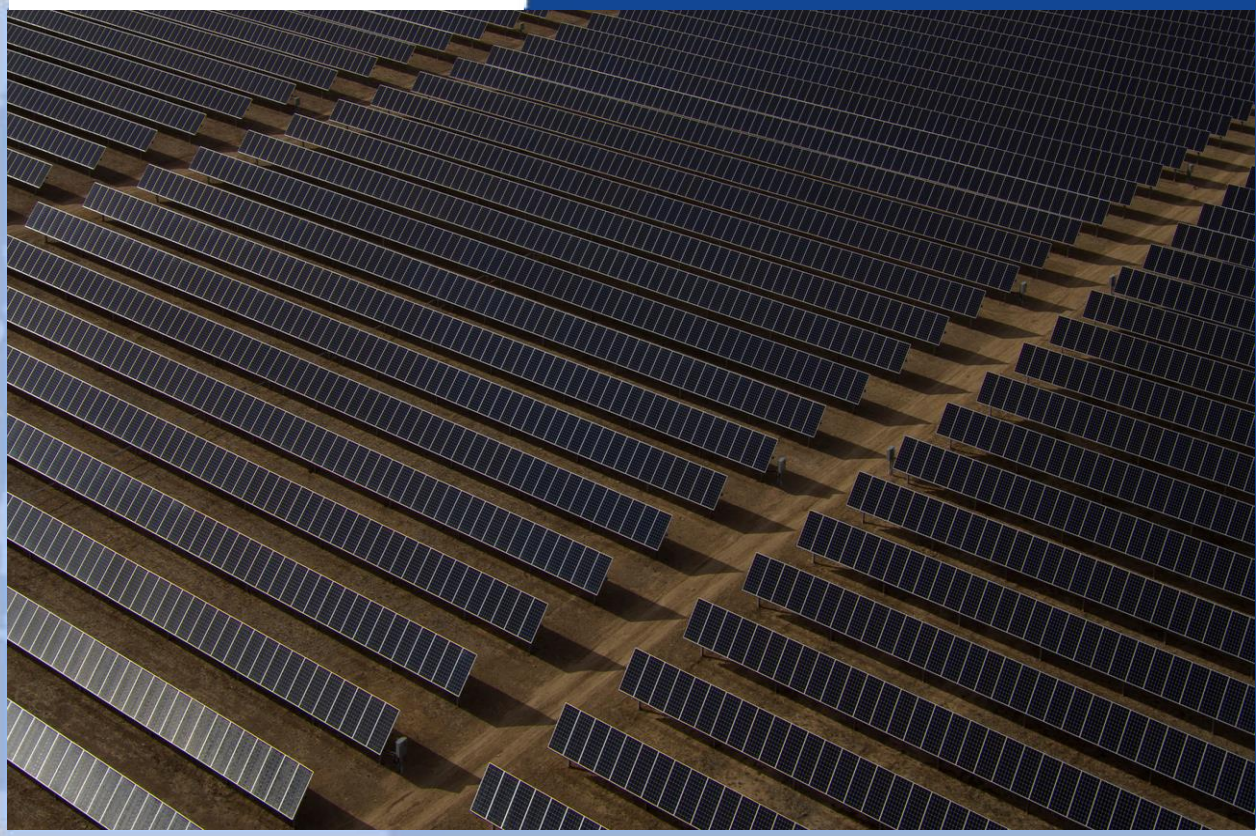
Dr. Mohammadbagher Forough



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For contact or orders: info@leidenasiacentre.nl

M. de Vrieshof 3, 2311 BZ Leiden, The Netherlands

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Abstract

This research project unpacks China's expanding role and increasing influence in the renewable energy sector of the Middle East and North Africa (MENA). After discussing the background of the topic, it focuses on specific cases of Chinese cooperation with Saudi Arabia, the United Arab Emirates (UAE), Iran, Turkey, and countries in North Africa (particularly Egypt and Morocco). The report concludes by summarizing the findings, pointing to the challenges of cooperation between China and MENA countries in the renewable energy sector, and making policy recommendations for the EU and Dutch policymakers.

Contents

1. Introduction: The Greening China Versus the Polluting China

China's relationship with sustainable energy, as with many other things, is a paradoxical one. On the one hand, the country is the largest polluter in the world. On the other hand, it is increasingly establishing itself as a green energy superpower. Let us unpack this point further. According to the Netherlands Environmental Assessment Agency (Reuters, 2007), China overtook the US in 2006 as the largest emitter of carbon dioxide, the greenhouse gas that is mainly responsible for anthropogenic climate change. In 2019, China emitted more CO2 than the US and the rest of the developed world combined (CNBC, 2021).

At the same time, in recent years China has established itself as a superpower in the green technology sector. The country is already leading the world in some important renewable energy statistics. According to the UN Environment Program (UNEP, 2019), China has been by far the biggest investor in renewables capacity over the past decade. Between 2010 and the first half of 2019, it committed US$758 billion to renewables, more than any other country or even region in the world. The total European investment in renewables in the same period was US$698 billion (ibid). China is the world's largest producer of wind power (Unwin, 2019), solar power (IRENA, 2021 – see also Figure 1 below) and hydroelectric power (Power Technology, 2013). It overtook the US as the largest market for electric vehicles in 2015 (Jaeger et al., 2017). As of early 2017, China boasted five of the world's six largest solar module manufacturing companies and the world's largest wind turbine manufacturer (Slezak, 2017).

The country is steadily establishing its 'global leadership' (Chiu, 2017) in renewable energy.

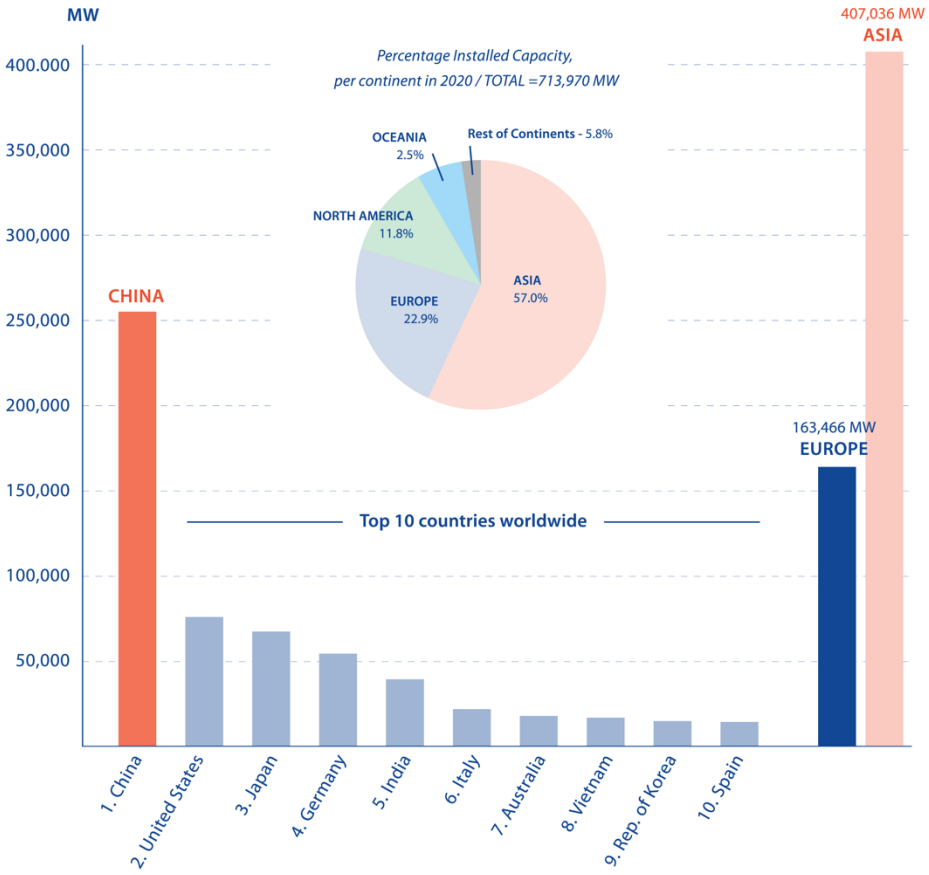

Figure 1: Top ten countries in the world in terms of installed capacity for solar energy
Original data for this figure come from International Renewable Energy Agency (IRENA)

The paradox of China's relationship with sustainable energy can be partly explained by taking a broad view that examines both the internal and external drivers of China's going-green policy. The internal factors driving this policy include, first and foremost, the severe environmental pollution that has accompanied the unprecedented economic rise of China in the last five decades. The external factors include: the increasing momentum that climate change has received as an issue that needs to be addressed at the global level; China's rise as a global power, which necessitates leadership in all areas of global concern (including the green energy sector); and equally (if not more) importantly, the green economic opportunities that have emerged as part of the growing momentum to tackle climate change.

These domestic and global factors have significantly influenced China's development agendas (such as the Five-Year Plans), its economic programmes (such as the ongoing reorientation towards domestic consumption), its technological ambitions (such as the 'Made in China 2025' programme), and its economic foreign policy. China's national ambitions to reduce environmental pollution appeared in its Five-Year Plans as early as the tenth plan (2001-2005), if not even earlier. This plan, among other things, aimed for a 10% reduction of urban and rural air pollution, and put 'environmental protection' and 'ecological conservation' clearly on the agenda (NPC, 2001). Since the start of the new millennium, and especially during the 2010s, China has consistently improved its track record along these lines. Although China and the US are still regarded as the world's two largest polluters, according to the World Bank, China's CO2 emissions per unit of GDP (see Figure 2 below) have been steadily decreasing (World Bank, China's CO2 emissions).

In 'Made in China 2025', which is China's official technological vision to become a global tech leader, green technologies (such as advancements in green energy and green vehicles) can be found among the top priorities. In 2016, the Chinese Ministry of Industry and Information Technology (MIIT) announced an 'Industrial Green Development Plan' (IGDP) that is heavily focused on greening the Chinese economy. This plan contains both incentives, such as support for R&D, as well as harsher measures, such as the closure of 'zombie enterprises' that are no longer economically and environmentally viable (OECD, 2017).

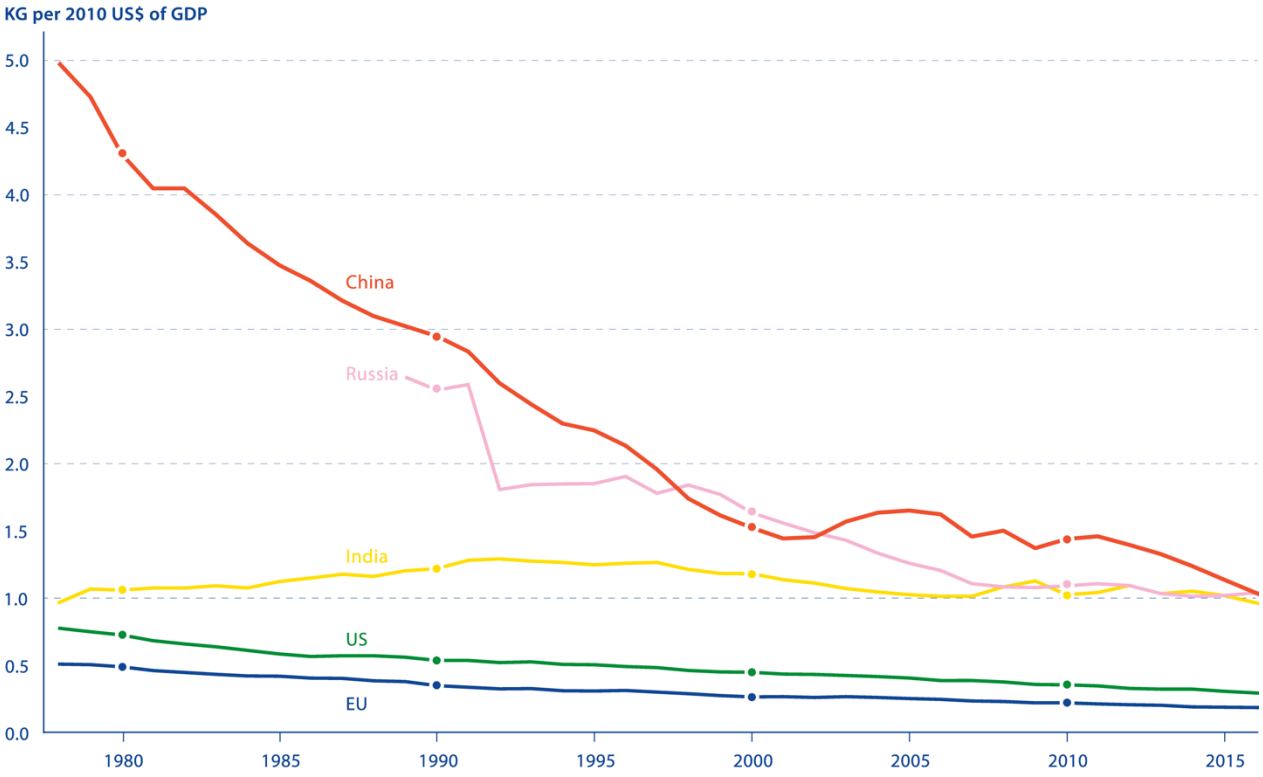

Figure 2: CO2 Emissions – KG per 2010 US$ of GDP
Original data for this figure come from World Bank

Along the same lines, Chinese official outlets have advocated for the discourse of 'ecological civilization' or *shengtai wenming* (Hansen et al., 2018). This discursive trope is being summoned to reimagine the Chinese 'civilization' and reorient the country's educational, economic, and cultural programs towards greater sustainability. As a timeline for this, the Chinese president Xi Jinping announced in his 2020 address to the United Nations General Assembly that 2060 is to be the year by which China will have become carbon neutral. The US and the EU have set 2050 as their target year.

In 2015, Xi introduced a grand scheme called Global Energy Interconnection (GEI), the aim of which is 'to transform the world's power grids' (Downie, 2019). Contemporary energy networks are fragmented and dispersed along national lines. The GEI scheme proposes increasing the connectivity between these national networks to create a well-integrated system. This interconnected set of energy networks would function as the main platform for a global transition towards a new energy system. It will be based around three pillars: clean

energy, smart grids, and a new technology for long-distance power lines called ultra-high-voltage (UHV) transmission (Downie, 2019). The GEI scheme is becoming a foundational component of Chinese energy foreign policy.

China's rise in the renewable energy sector is creating economic (and, by extension, geopolitical) concerns for both the US and the EU. The US and the EU are slowly waking up to the speed with which China is racing towards a green economy. At present, the US is not acting in an organized way to bring about a green transition. This is partly due to the economic and political nature of the country, where the state acts in one way and private actors in another. It is also partly due to the recent setbacks created by the Trump administration's poor record on the environment.

Some US policymakers and analysts have been trying to sound the alarm about the leading position that China is occupying in the green sector. John Kerry, for instance, has urged the US political and economic establishment not to 'let China win the green race' (Kerry and Khanna, 2019). Along the same lines, Ladislaw and Tsafos (2020) argue that 'Beijing is winning the clean energy race' and point to the 'green revolution' that China's leaders are calling for as well as 'the invention and manufacturing of green technology' that is already taking place there. They argue that while other countries offer rich markets for such green inventions and products, the US is not mobilizing its full potential in areas such as manufacturing, R&D, and deployment of green technologies.

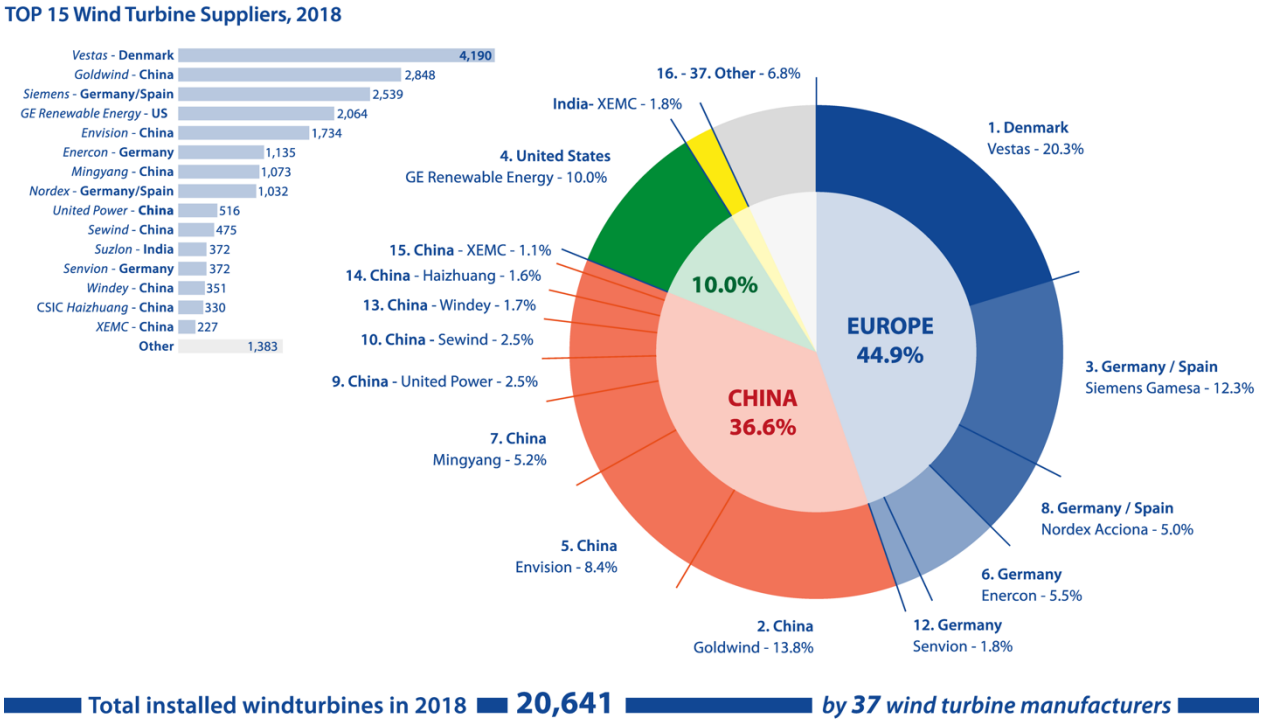

Figure 3: Original data for this figure come from GWEC

Europe is making a more concerted effort in this sector than the US. The EU formulated a 'European Green Deal' (EU Commission, 2019). This is a new 'growth strategy' that strives to make Europe 'the first climate neutral continent'. The deal has major ambitions that cover 'all sectors of the economy, notably transport, energy, agriculture, buildings, and industries such as steel, cement, ICT, textiles and chemicals' (ibid). So far, the deal has not been converted into law, but that is in the making. On 21 April 2021, the EU Parliament and the European Council reached a provisional agreement on the first ever EU climate law. This will make the bloc's goal of reaching climate neutrality by 2050 'irreversible and legally binding' (Nicholas, 2021a). This agreement has met with some criticism including suggestions that the EU national governments are watering it down (Nicholas, 2021b). However, the agreement at least keeps the EU moving in the right direction.

Europe's relationship with China regarding climate issues and the green sector is one that used to be framed in terms of 'partnership'. However, now that climate action has become much more 'material to economic interests, these two climate superpowers will both compete

and cooperate with each other, against the backdrop of an overarching systemic rivalry' (Oertel et al., 2020). This competition will take place on several fronts. It will see the EU investing in green technology at home within Europe to remain technologically and economically competitive. This is particularly visible in the green hydrogen sector. In this sector, Europe will have to avoid repeating the negative lessons of the solar panel technology. In that sector, China received a considerable amount of technological know-how from Europe but got the upper hand in the manufacturing of solar panels. European competition in the green sector is essential so as not to let China be the sole winner of the green race.

One of the global regions in which this competition has unavoidably taken place is the MENA region. This region is geographically situated between China and Europe and is becoming an arena of competition for influence in the green sector for the two powers. This report examines China's increasing presence in the renewable energy sector of the MENA region. The analysis proceeds as follows: Section 2, following this introduction, discusses the environmental challenges the MENA Region faces. Section 3 briefly discusses the rise of China in the MENA region's sustainable development. The following sections discuss China's economic cooperation in the green sector with specific actors: GCC countries particularly Saudi Arabia and UAE (Section 4), Iran (Section 5), Turkey (Section 6), and North Africa (Section 7). The conclusion (Section 8) will summarize the findings and discuss the challenges that lie ahead for China-MENA cooperation in the renewable sector cooperation. It will also make policy recommendations for the EU and the Netherlands.

2. The MENA Climate and Economic Challenges

The MENA region is in the midst of a severe environmental crisis. There is no prospect of the region meeting the seventeen sustainable developmental goals (SDGs) that have been set by the UN for the world to meet by 2030. The MENA region is the most water-stressed region in the world. According to a NASA study that reconstructed the drought history of the region, 'the recent drought that began in 1998 in the eastern Mediterranean Levant region, which comprises Cyprus, Israel, Jordan, Lebanon, Palestine, Syria, and Turkey, is likely the worst drought of the past nine centuries' (NASA, 2016 – see Figure 4 below). As a consequence of this severe water shortage, the World Resources Institute (WRI) has reported, twelve out of the seventeen most water-stressed countries in the world are in the MENA region (Hofste et al., 2019).

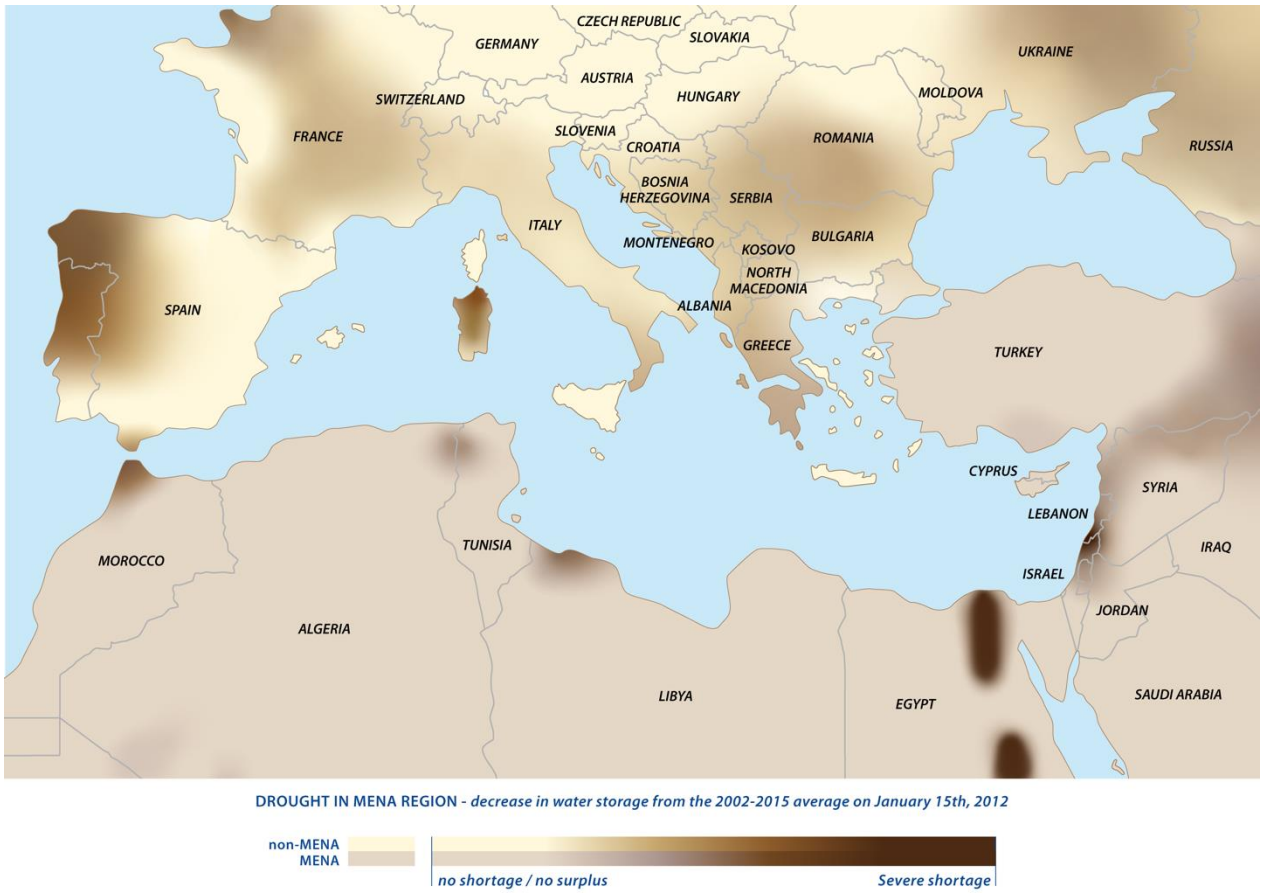

Figure 4: NASA Finds Drought in Eastern Mediterranean Worst of Past 900 Years
Original data for the map come from NASA

There are myriad reasons for this. To begin with, the region has natural water scarcity due to insufficient rainfall. This water scarcity is being exacerbated by factors including but not limited to climate change, regional instability, rapid growth, water waste and misuse, and poor water management. The region is not doing enough to address any of these issues. For instance, according to a World Bank report, in this region '82% of wastewater is not recycled' (World Bank, 2017). The report goes on to say that recycling more wastewater would present 'a massive opportunity to meet water demands'. It states that the MENA region 'has the greatest expected economic losses from climate-related water scarcity, estimated at 6–14 percent of GDP by 2050'.

The water stress in the MENA region naturally leads to other problems. Water insecurity can lead to food insecurity (Hameed et al., 2020) especially in poorer countries (such as Yemen), those with displaced populations (such as Syria and Palestine), and those hosting the displaced populations (such as Lebanon and Jordan). Droughts and floods hit poor, vulnerable populations the hardest, endangering their sources of income and food security (Fragaszy et al., 2020). In this way, they increase the likelihood of social and political instability (Sofuoğlu et al., 2020).

A case in point is Syria (Selby et al., 2017). The extreme drought prior to the outbreak of the Syrian civil war in 2011 has become an iconic, and tragic, example of how (anthropogenic) climate change is a 'threat multiplier' and can lead to political and social instability that overflows the traditional boundaries of nation states or even regions. The Syrian refugee situation, for instance, is one that has not only affected regional countries (such as Turkey, Lebanon, and Jordan) but also neighbouring regions, such as Europe.

Apart from a climate crisis, the MENA region is also struggling with protracted economic challenges. In the 2010s, the economic outlook of regional countries started deteriorating due to several factors including low oil prices, new waves of regional instability in the wake of the Arab Spring, and the US becoming a net exporter of petroleum products (EIA 2020). The growth of real GDP, which slowed down with the financial crisis of 2008, 'further decelerated in the second of half of the 2010s and became negative in 2020 as result of the COVID-19 shock' (Dabrowski & Domínguez-Jiménez 2021).

One of the main underlying causes of such socioeconomic and political challenges is the region's excessive reliance on natural resources. This gives the MENA region its own paradoxical dimension, namely the 'resource curse' or 'the paradox of plenty' (Ross, 1999). While such readily available resources have created a semblance of systemic stability in some countries, they have hampered all-inclusive developmental agendas, invited foreign interventions, created inter-state rivalries, to mention only a few problems. At present, oil and gas prices are showing a downward trend with more oil and gas reserves being discovered around the world. There is also a growing awareness about the need to tackle climate change. The world will soon have to move beyond hydrocarbon resources, which are depleting anyway, and will be scarce in a matter of decades. The MENA region therefore urgently needs to transition to a more sustainable, post-hydrocarbon socioeconomic order. This is necessary for all manners of environmental, economic, and socio-political reasons.

Economic diversification is slowly gaining currency in the region. Regional leaders have mostly recognized the economic and socio-political advantages of green energy sources such as solar, wind, and hydro power. Deployment of renewable energy has been officially recognized by several regional capitals as an opportunity for industrial diversification, technology transfer, and new value-chain activities. Enter China.

3. China and Sustainable Development in MENA region

China is geoeconomically engaging the MENA region in more ways than one and places great importance on this region (Forough, 2019). MENA countries have generally welcomed the global rise of China. In a sense, before the US pivoted to Asia under Obama to contain the rise of China, there was a Middle Eastern pivot to Asia. Many of the main regional actors shifted their focus to the East. This pivot was further encouraged by the fact that the US was then drilling oil and gas on its own soil. Energy exporters in the MENA region, such as Saudi Arabia, Iran, Iraq, Qatar, the UAE and others, were looking for a market. With their growing thirst for energy, China, India, Japan, Korea and other Asian countries seemed like obvious export targets. More generally, regional actors have come to interpret the contemporary world in terms of the rise of Asia, and particularly the rise of China.

Regional actors have accordingly aligned their developmental and geoeconomic visions with the rise of Asia/China, particularly with China's Belt and Road Initiative, the BRI (Forough, 2021b). These visions more often than not point towards a post-hydrocarbon, sustainable economy, in which China is set to play a major role. China has been actively attempting to increase its footprint in the 'greening' of the MENA region. This increasing footprint in the renewable sector was promised in the 2015 Arab Policy Paper of Chinese government, which envisioned a clear role for China in the greening of the region (among other things) without offering details.

This policy paper introduced the concept of '1+2+3 cooperation pattern'. In this concept, 1 stands for (traditional) energy as a core interest between China and the region, 2 points to infrastructure construction and trade and investment, and finally 3 represents nuclear energy, satellites, and new energy sources. When it was issued in 2015, the policy paper was dismissed as lacking details. With the benefit of hindsight, one can argue that this policy paper showed relatively clearly the broad patterns of how the relationship between China and MENA states was going to develop. Since then, China's developmental, economic, and energy relations with the MENA region have increasingly been developing along the general lines that were outlined in this policy paper.

When it comes to renewable energy development, relations between China and MENA states have expanded very rapidly. On one side, China is emerging as a green superpower in need of new markets and new influence. On the other, the MENA region urgently needs to transition towards a more sustainable economy. China has been acting along multiple dimensions to solidify its position in this sector. It has utilized 'a combination of power politics, financing, and infrastructure development' with the aim of 'becoming a driving force in the region's transition to green development especially in clean energy' (Elnaggar, 2019).

The following section of this report briefly examines Chinese cooperation with different MENA region actors to shed light on the depth of Chinese engagement with them in this increasingly strategic sector.

4. The GCC and China

The Gulf Cooperation Council (or GCC) countries have all enthusiastically embraced the global rise of China. The US pivot to Asia that begun around late 2011 meant less American attention paid to the Middle East. This produced a sense of (potential) insecurity in GCC countries, which are dependent on the US for their security. GCC-US relations were solid before the US pivot. After the pivot, the GCC states and businesses started actively courting China and embracing its increasing presence in the MENA region. These countries have all expressed the (potential) alignment and synergies between their developmental visions and the Chinese BRI. Such visions include the Saudi Vision 2030, the Abu Dhabi Economic Vision 2030, the Qatari National Vision 2030, the Oman Vision 2040, Bahrain's Vision 2030, and finally the New Kuwait Vision 2035. Given that all these six economies are heavily dependent on hydrocarbon exports, transition to renewable energy is part and parcel of their development visions.

The renewable energy sector is therefore increasingly becoming one of the pillars of the (comprehensive) strategic partnership between the GCC countries and China. Both sides of this partnership are among the top polluters in the world and in dire need of this transition. As illustrative examples, the following part of this report will discuss Chinese renewable energy relations with Saudi Arabia and the UAE. These two countries have been the most proactive amongst the GCC countries, and arguably in the MENA region, when it comes to renewable energy cooperation with China.

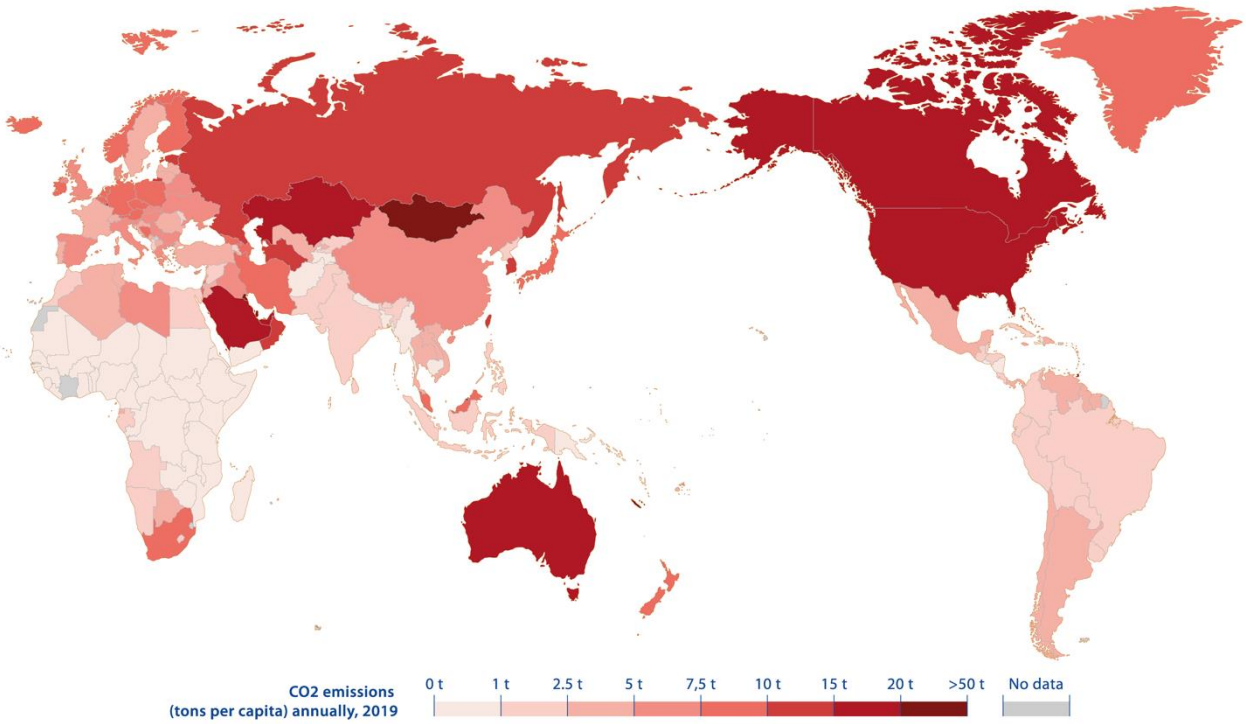

Figure 5: Original data for the map come from Ourworldindata

Saudi Arabia and the UAE are among the top polluters in the world on a per capita basis (see Figure 5 above). Because of this, the leadership in both countries has placed a premium on renewable and sustainable energy in their development visions. Both countries have also been enthusiastic proponents of the Chinese presence in the region, including its BRI. Saudi Arabia and the UAE both appear to have concluded that continuing their traditional modes of economic production is not going to be sustainable. The two have therefore tried to be proactive (relative to other countries in the region) in the renewable energy sector.

The UAE has secured the position of hosting the International Renewable Energy Agency (IRENA). The fact that this agency is based in the UAE speaks to how eager this country is to establish itself as a regional, and even global, hub for renewable energy multilateralism. IRENA being in a China-friendly country and region provides a positive atmosphere for cooperation between China. This is evident in IRENA press releases, as well as in the numerous memoranda of understanding that the organization has signed with Chinese entities, such as the 2021 MoU with the State Grid Corporation of China (SGCC) to 'advance [energy] transition through power system enhancement' (IRENA, 2021).

The UAE also boasts a planned city project called Masdar City. This development relies on renewable energy sources and hosts the headquarters of IRENA. Located within the city, is the Masdar Institute, one of the few advanced graduate schools around the world dedicated solely to clean energy fields. The UAE has set long term ambitions regarding renewable energy. It launched the national 'Energy Strategy 2050', which aims 'to increase the contribution of clean energy in the total energy mix from 25 percent to 50 percent by 2050 and reduce carbon footprint of power generation by 70 percent' (UAE, Energy Strategy 2050). These are ambitious plans. However, one thing is clear, the UAE is increasingly viewing renewable energy as attractive.

The Saudi Vision 2030, which is Saudi Arabia's main development plan, places a clear emphasis on economic diversification away from the country's reliance on hydrocarbons. Renewable energy is one of the pillars of this planned diversification. Saudi Arabia has committed to 50% clean energy by the year 2030. It remains to be seen how realistic this goal is (Collins, 2021). The country has already begun to develop its solar power industry (Yamada, 2016). This development has especially occurred since 2015, when a leadership succession took place, making Mohammed Bin Salman the de facto leader.

Both the UAE and Saudi Arabia have already established extensive cooperation with China in the renewables sector. The Saudi company ACWA Power is a major financier, developer, and investor of power generation and desalination plants, both in Saudi Arabia and across the MENA region. In the early 2000s, Saudi Arabia relaxed restrictions on private companies participating in the electricity and desalination projects in the country. ACWA Power, which is 50% owned by the Saudi sovereign wealth fund The Public Investment Fund (ACWA, 2020a), seized this opportunity and emerged as both a national and regional utility provider. It aims for renewable energy projects to constitute 70% of its portfolio by 2030 (Carvalho, 2019).

China's state-owned Silk Road Fund (SRF), which was created to invest in projects that are part of the Belt and Road Initiative (BRI), has 'signed an agreement to purchase a 49% stake in Saudi Arabian company ACWA Power' (ACWA, 2020b). The president of ACWA hailed this agreement as a sign of the deepening strategic relations between Saudi Arabia and China:

> ACWA Power RenewCo is ACWA Power's renewable energy platform that currently owns a number of its existing renewable energy projects. The platform capitalises on the rapidly growing potential for renewable energy in emerging markets and currently owns ACWA Power's concentrated solar power, photovoltaic solar, and wind assets across the United Arab Emirates, South Africa, Jordan, Egypt and Morocco, yielding an aggregate power capacity of 1668 MW. (ACWA, 2020b)

The partnership between the Silk Road Fund (SRF) and ACWA has also resulted in two Chinese investments in the UAE. The first of these is the 950MW hybrid concentrated solar power (CSP) and photovoltaic (PV) fourth phase of the Mohammed bin Rashid Al Maktoum Solar Park. This will power 320,000 residential homes' (ibid). The second is the 2400MW Hassyan clean coal power plant. This is the first 'clean coal' power plant in the GCC region. The main contractor of this plant is Harbin Electric Corporation, a company based in China's north-eastern Heilongjiang province (Nan, 2020).

ACWA Power, now 49% owned by the Chinese and 51% by the Saudis, has effectively become the main vehicle for Chinese efforts to gain a foothold in the MENA region's renewable energy sector. Sino-Saudi cooperation in this sector is more than a bilateral relation issue. It is turning into a regional renewable energy cooperation strategy for China and Saudi Arabia.

The UAE is aiming for a similar strategy in its approach to China. The country aims not only to bring Chinese investment and technology to its renewable energy sector, but also wants to become an investment partner of China in renewable energy projects in different countries along the BRI geography, according to Abu Dhabi's energy chief, A. M. A. Al Marar (McNeice, 2020). This happened especially on the heels of the 2019 memorandum of understanding that was signed between China's State Grid Corporation and Abu Dhabi's Department of Energy (ibid). To transition beyond fossil fuels, in 2006 the UAE established a renewable energy and sustainable urban development company called Masdar, otherwise known as Abu Dhabi Future Energy Company. The company is funded mostly by MUBADALA, which is an Emirati sovereign wealth fund. The chief of Masdar has already identified areas of potential

cooperation between the company and Chinese entities around the world. This cooperation includes a joint shareholding investment in the Dudgeon Offshore Wind Farm in the United Kingdom. Masdar's chief has also pointed out that, from the perspective of his company:

> China has led the renewable energy revolution over the past decade […] It is the largest in terms of renewable deployment globally. I strongly believe that China will continue to be the leader globally when it comes to the deployment of renewable energy. [In terms of cooperation with China] 100 percent we can expect more going forward […] China and Chinese companies are very important to us. If you are in the business of renewable energy, you have to look to China, you cannot ignore China. (McNeice, 2020)

The position taken by this state-owned company for all intents and purposes represents the position taken by the UAE as a whole. Both the UAE and Saudi Arabia are making renewable energy cooperation with China a major part of their transition to a sustainable development strategy at home as well as their investment policy abroad. It is also clear that if this trend continues, China's green engagement and footprint in the region will continue to expand.

5. Iran and China

China's rapidly increasing influence in the region's sustainable energy sector is not limited to the Gulf Cooperation Council (GCC). As is customary for China, it is working with all regional powers on strategic issues such as sustainable energy. Iran places great importance on its relations with China (Forough, 2021a). After Iran signed the Nuclear Deal (or Joint Comprehensive Plan of Action, JCPOA) with world powers (including China) in 2015, Xi Jinping was the first leader of a major country to visit Iran. The visit took place in January 2016. This trip solidified the position of Iran in the BRI. Seventeen economic agreements and memoranda of understanding were signed under the framework of the BRI.

During this trip, China and Iran also started negotiating to elevate their relations to the level of 'comprehensive strategic partnership'. The negotiations led to the '25-year deal' (Forough, 2021c). This deal comprehensively connects the Iranian economy and developmental strategy in the next three decades to China. Needless to say, it includes sustainable technologies and renewable energy as important areas of partnership and cooperation between the two countries. Both countries have formulated their cooperation in the renewable energy sector under the discourse of 'Belt and Road Cooperation', according to the Iranian Renewable Energy Association (IRNA, 2020).

Since signing the nuclear deal in 2015, Iran has been looking for cooperation opportunities with both Western and Chinese actors in the field of renewable energy. The country is potentially fertile ground for renewable energy production such as solar (with around 300 days of sunshine per year), hydropower (through the country's river system), and wind corridors that pass through the country (with the country's northwest and northeast experiencing high winds throughout the year).

China's green cooperation with Iran includes nuclear, solar, and hydropower energy. In terms of nuclear power, China has been contributing to the development of the second reactor at the Bushehr Nuclear Plant. On Xi's trip to Iran in 2016, the two sides signed a deal to build two 1GW nuclear power plants on Iran's southeast coast, near the border with Pakistan (Rogers, 2016). According the head of the Atomic Energy Organization of Iran, this deal also included plans to cooperate on the 'modernization of the Arak heavy water reactor and the construction

of a number of 100MW power plants' (Ghorbani, 2017a). China supplied equipment for Iran's Sardasht hydropower dam (Financial Tribune, 2017a). In 2017, China financed and constructed up to 85% of the Rudbar Lorestan Hydroelectric Dam, which has a capacity of 450MW (Financial Tribune, 2017b). Also in 2017, China offered to finance the Chamshir Dam project (130 MW) to the tune of US$290 million (ibid).

The cooperation between Iran and China has also extended to the solar power sector. In 2016, China's Shanxi International Energy Group announced that it was ready to build photovoltaic power plants in Iran with a total capacity of 600MW (Ghorbani, 2017). In 2017, Iran's Industrial Development and Renovation Organization (IDRO) signed an agreement with the Chinese Sunshine Company and the Hong Kong-based company Konda Industry. These organizations agreed 'to invest in a fully automated solar panel production project' (ibid).

After the nuclear deal, Iran's intention was to diversify its strategic partnerships and cooperation by working with both Europeans and Americans, as well as with the Chinese and Russians. After the deal was signed, Iran signed several agreements, deals, and memoranda of understanding with European companies such as German and Greek companies (Ghorbani, 2017) to develop renewable energy projects. In 2018, when then US President Trump unilaterally withdrew from the Iranian Nuclear Deal, investment into Iran from Western companies came to a grinding halt. The Chinese investments in the country slowed down dramatically as well. After the Trump administration's withdrawal, no deals were signed with foreign partners in the renewable sector.

As a result of the US withdrawal from the nuclear deal, both the Iranian public and elites viewed the US as untrustworthy for economic cooperation and deal-making and saw the Europeans as unwilling or unable to defy American edicts and sanctions. It can be safely argued that China has come out of this process as the potential winner. This is especially true after the 25-year deal between China and Iran was made official. With this deal, China's position in the Iranian traditional energy sector has been solidified. Given the recent deepening engagement between China and Iran, China is set to have the largest share of Iran's renewable market.

Iran is currently in negotiations with world powers (including China) to revive the nuclear deal and bring the US back to the nuclear deal. If this happens and economic relations between Iran and the rest of the world are normalized, then the previous momentum (as seen between 2015 and 2018) for economic cooperation with Iran in all economic sectors including renewables will most probably return. In that scenario, China is likely to be the most significant player in this Iranian energy market (both renewables and hydrocarbon) as the Iranian elites' trust in Western states and companies is at a low point after 2018. What is more, Raisi has been elected as the next Iranian president. He is a conservative figure, who is automatically suspicious of Western countries and more inclined to have a less negative attitude towards China and other non-Western partners of the country.

6. Turkey and China

The Turkish and Iranian cases are similar in some respects. Like Iran, Turkey has experienced a sense of disenchantment in its relationships with Western partners on both sides of the Atlantic. There is a scholarly consensus emerging that Turkey is reappraising its alliances and relations with the West and once again 'pivoting' to 'Eurasia' (Erşen & Köstem, 2019). This is also evident in the 'Asia Anew' policy that was announced by the Turkish Foreign Minister in 2019 (Anas, 2020). In recent years, Turkey has also elevated its relations with China from 'strategic cooperation' to 'strategic partnership', with the potential, according to Erdogan, to uplift it further to the level of 'comprehensive strategic cooperation' (Xinhua, 2019a).

Like other countries in the region, Turkey has been attempting to make its energy portfolio greener and is transitioning towards renewable energy. China has had its eyes fixed on Turkey as well. The coming together of the two countries in the renewable energy sector has been an inevitability. There has been a 'green turn in Sino-Turkish relations' (Ergenec, 2020). The relationship between the two includes cooperation in sectors such as nuclear power, hydropower, and solar energy.

As is the case with Iran, the most developed form of renewable energy in Turkey is hydroelectric power, which comprises 20%-30% of the electricity production in the country depending on hydrological conditions in a given year (Turkish Ministry of Energy). In Iran, hydroelectric power comparatively comprises between 16% and 20% of electricity production (Tehran Times, 2021). Turkey has massive ambitions for this particular sub-sector of its green energy due, amongst other things, to its topographical characteristics that are well suited to the development of hydroelectric plants. This has not escaped the attention of the Chinese state-owned enterprises and private companies that are involved in this sector. In 2020, the Chinese engineering company Gezhouba Group, together with KAF Teknik Yapı from Turkey, and General Electric from the US, started to develop a 1000-megawatt (MW) pumped-storage hydroelectric power plant in Turkey's Isparta province (Daily Sabah, 2020).

The nuclear energy sector is another area in which Turkey is making long-term investments. The Isparta hydroelectric plant is described by Turkish officials as 'complementary to the Akkuyu nuclear power plant', which is also being developed in the same region and is

planned to be completed in 2023 (MEMO, 2020). This is Turkey's first nuclear plant, which is being built with the help of Russia. A second plant, in Sinop, was supposed to be built with the help of Japan and France. Feasibility studies continue to this date, with some stakeholders abandoning the plan.

President Erdogan has said that Turkey plans to build its third nuclear plant with the help of China. This is based on a 2014 agreement made with China's State Nuclear Power Technology Corporation (SNPTC) and Westinghouse of the US. Erdogan has also said that Turkey will send its students to France, Japan, and China for education in nuclear physics. Among Chinese nuclear developers, the State Power Investment Corporation (SPIC), which is a large state-owned enterprise focused on nuclear development, is already active in Turkey. According to Hao Hongsheng, who is the General Manager of the SPIC Nuclear Energy Department, the company is involved in projects in Turkey and 'will participate in the construction of Turkish NPPs and adopt CAP1400 technology to four nuclear power units' (Yawen, 2019). It is claimed that 'the State Nuclear Power Technology Corporation developed CAP1400 with independent intellectual property rights. It is an advanced third-generation nuclear power technology with a power generation capacity of 1.5GW' (ibid). China is therefore hoping to find its position in the nuclear market next to the US, Russia, France and Japan; Turkey is a space where China is both competing and cooperating with these global nuclear powers.

Sino-Turkish cooperation also extends to the realm of solar energy. In 2016, the two countries established the HT Solar Energy firm that produces solar modules in the Tuzla Free Zone in Istanbul (Xinhua, 2021). The company is a subsidiary of the Chinese fully state-owned company HT-SAAE (HT Solar Energy). The manufacturer has been supplying solar modules to both the Turkish market as well as European and American markets. Both China and Turkey hail this cooperation as mutually beneficial. Another example of Sino-Turkish cooperation in the solar panel industry involves the Turkish company Kaylan Enerji, which has received financial backing from the China Electronics Technology Group Corporation (CETGC) to construct a 500MW solar module factory. CETGC is a Chinese state-owned military surveillance contractor, operating in the solar sector through a unit named CETC Solar Energy Holdings (Bellini, 2019).

For China, Turkey offers both a new market as well as a springboard to other markets. For Turkey, the cooperation creates jobs and brings both technological and economic advantages. However, the solar panel (photovoltaic) sector is also producing some headaches for Turkey. It is undermining Turkey's domestic industry because of dumping of Chinese panels in the Turkish market that has occurred in recent years. In 2017, the Turkish government conducted an anti-dumping investigation against Chinese companies. This resulted in an anti-dumping fee against solar panels imported from China into the country. This fee raises the price of Chinese panels by 30%-35%, a move that was welcomed by Turkish producers.

To sum up, economic relations between Turkey and China, including those in the renewables sector, have been steadily growing. A 2017 newsletter produced by the Turkish Exporters Assembly attributes the 'faltering' Turkish economy to 'over-reliance on a weak EU economy' and regional 'turmoil'. This newsletter advocates for the 'Look East Policy' that has been adopted by the government of Turkey. It describes how, regarding relations with China and increasing Turkish exports to the Chinese market, Turkey 'aims to establish a proper legal infrastructure, lift all trade barriers, [and] develop an effective cooperation in the field of customs and standards' (TIM, 2017: 38). It is safe to forecast that, as the world recovers from the COVID-19 pandemic, the footprint of China in Turkey's economy is set to expand. This includes its presence in Turkey's renewable energy sector.

7. China and North Africa

China is currently by far the largest source of foreign direct investment in Africa, as well as its largest lender and investor in infrastructure. Naturally, this includes the renewable energy sector in both sub-Saharan and North Africa. In sub-Saharan Africa, China is becoming 'increasingly involved in renewable energy deployment' (Lema et al., 2021). In North Africa, which is the focus of this section of this report, a similar trend can be observed. North Africa has been growing economically in recent years and requires more energy. Renewables are finding their way to the region. So is China. In what follows, this report examines the most significant aspect of green energy cooperation between China and North African countries, that is, the cooperation on solar power. This source of energy is particularly popular with the governments in the region.

In the solar energy sector, the North African region has great potential due to the abundance of sunshine. This potential source of energy (and economic market) can not only benefit the countries in the region but also outside actors, such as business enterprises from China and Europe. The solar energy sector in North Africa also offers a potential platform for China to produce solar power and solar power technology and export it to other markets. China is already establishing some presence in the region. As mentioned earlier in this report in the section about the Gulf Cooperation Council, the Sino-Saudi company ACWA Power has invested in Egypt and Morocco.

In Egypt, China is investing in solar power through the Gezhouba Group (Feukeng, 2020). This project aims to produce 500 MW of electricity. In 2020, it was reported that China and Egypt had been negotiating the establishment of an industrial complex in Egypt that would manufacture photovoltaic solar panels from sand (Mubasher, 2020). This type of cooperation is not dissimilar to the Sino-Turkish company HT Solar Energy discussed in the previous section.

Egypt is also home to the Benban Solar Park, which is the largest solar farm in the world with a designed capacity of 1.8 GW. Several European countries, banks, and companies are involved in this project. So is China. In 2019, China's renewable energy company TBEA Sunoasis completed the construction of three solar power plants in the park. The three projects

were financed by the World Bank as well as the Asian Infrastructure and Investment Bank (AIIB), an international organization created by China, in which it is the largest stakeholder (Xinhua, 2019b).

In Morocco, China has been involved in the construction of the NOOR project, which also breaks some world records. Phase two and three of the project were built by Shandong Electric Power Construction Corporation (SEPCO III), a subsidiary of the Power Construction Corporation of China. This construction project reportedly created 13,000 local jobs and received awards for social responsibility from local authorities (Helioscsp, 2019). According to Liang Xinfeng, who is chief engineer of phase two of the NOOR project, the 200-MW Noor II has 'the world's largest installed capacity as a parabolic trough concentrated solar power plant, while the 160-MW installed capacity of the NOOR III is the largest among the world's concentrated solar power plants' (ibid).

China is similarly increasing its presence and influence in the renewable energy sectors in Tunisia (CGTN, 2019) and Algeria (Renewables Now, 2016), especially in terms of solar power. There is a common understanding in this region that China is becoming a renewable energy 'superpower' and is highly 'competitive in terms of quality, technology, and price' (CGTN, 2019). Some regional actors are taking the relationship even further. Egypt, for instance, is in negotiations with the Chinese telecommunication company Huawei to transform its energy system into a smart grid (CGTN, 2020). Such plans point to something larger than economic cooperation. They reveal that, for regional actors such as Egypt, there is no sense of discomfort in strategic cooperation with China. This contrasts with the recent discomfort expressed by some Western countries about this type of cooperation.

8. Conclusion

This concluding section of the report is comprised of three parts. The first part (8.1) presents a summary of the findings of this report: The next part (8.2) discusses some challenges facing the cooperation between China and MENA countries. The final part (8.3) offers some policy recommendations for the EU and the Dutch government. Each of the three parts of this conclusion starts with a summary paragraph, and then proceeds to elaborate on more specific points.

8.1 Summary of the Findings

Sino-MENA relations (just like Sino-African relations) are deepening by the day. The region has enthusiastically welcomed the rise of China as a global power. While hydrocarbons are still the main attraction of the region for China, a new area of cooperation is emerging and gaining momentum: the renewable energy sector. Regional actors are slowly but steadily waking up to the environmental and economic urgency of their situation. China is emerging as the go-to option for these countries, with some competition coming from European private companies. The following are some specific findings of this research project:

- China has made transitioning to green energy a strategic priority for both its domestic policy and economic foreign policy. MENA countries are also beginning to realize that they urgently need to transition to green energy. They are starting to plan accordingly.
- The MENA region is experiencing its worst environmental crisis in almost a millennium and is in desperate need of investment in the green sector. It is proving to be an attractive market and a welcoming strategic partner for China.
- Regional actors increasingly perceive China as a global 'leader' or 'superpower' in the renewable energy sector.
- In the cooperation between China and specific MENA region countries, both sides are either currently raising their cooperation to the level of a 'comprehensive strategic partnership' (e.g., GCC countries and Turkey) or have already raised it to this level (e.g., Iran).

- China and regional actors discursively frame their cooperation in the renewable energy sector under the rubric of the 'Belt and Road Initiative', which is the overarching narrative under which China is operating around the globe.
- China is buying large stakes in regional companies to facilitate its entry into the market. An example is ACWA Power, which is now a Sino-Saudi company that is involved in projects across the region. China is using such companies as platforms for further regional engagement.
- China is facing some competition from Europe (especially in the green hydrogen sector), albeit in an unsystematic fashion that is mostly driven by private actors.
- China's efforts are systematic and policy-oriented. They come as a comprehensive package that makes sense *in* and *of* the region. They include investment (both public and private), discursive tropes (such as 'ecological civilization'), a global energy policy (Global Energy Interconnection), a popular geoeconomic framework (the BRI), accompanied by an international organization (AIIB), and designated funds (Silk Road Fund).
- If the current trends continue, China is set to become the dominant actor in the renewable energy sector in the MENA region.

8.2 Challenges of Regional Cooperation With China

Although the relations between China and MENA countries are gaining increasing depth and breadth, they are also beset by several challenges. These challenges are environmental, political, social, and organizational. This part will touch upon some of the most important challenges facing Sino-MENA relations.

- The environmental conditions in the region are worsening by the day. The region is experiencing its worst crisis in 900 years according to NASA. Extreme weather situations like extreme heat and droughts (such as in 2021), floods (such as in 2020), and sandstorms are becoming increasingly common.
- Most regional countries display poor management when it comes to the environment. Water management particularly leaves much to be desired.

- The environmental crisis is a threat multiplier when it comes to other crises in the region (as the case of Syria has shown).
- Most regional countries suffer from a lack of political will to take environmental action which is due to corruption and/or the fragility of the state.
- Most regional countries do not have a sufficient, skilled workforce to deal with the challenges of transitioning to a more sustainable economy.
- The region lacks a well-functioning regional institution that can harmonize and regulate cooperation in the renewable energy sector, both between regional actors as well as with China.
- Unilateral sanctions can also multiply the problems for some countries in the region, such as Iran. The return of unilateral US sanctions on Iran has made it very difficult for Chinese and European companies to continue normal economic interactions with the country.
- Health risks, such as the COVID-19 pandemic, are also multiplying the other challenges and problems mentioned above. Regional countries are struggling immensely with the current pandemic.

8.3 Policy Recommendations for the EU/Netherlands

The most important recommendation for both the EU and Dutch policymakers is to develop a comprehensive, coherent strategy when it comes to renewables. It is necessary to develop both an EU and Dutch strategy regarding the role of renewables in the economic foreign policy of the EU and the Netherlands as well as in the European strategic narrative. The EU and Dutch strategies should ideally be mutually reinforcing. In the following list, this broad call for a comprehensive strategic approach is broken down into more specific points:

- There is a systematic (green) hydrogen strategy in the EU, which is paying dividends both at home and abroad, including in the MENA region. An example is the cooperation between Germany and Saudi Arabia in the green hydrogen sector. This systematic approach to cooperation should be extended to develop a comprehensive renewable energy policy as part of the EU's (economic) foreign policy.

- Europe needs to remember the lessons from its experience with China regarding solar panel technology. It should avoid repeating the negative aspects of that experience when it comes to new types of renewables, such as green hydrogen.
- Europe needs to develop enough strategic autonomy to protect its economic and strategic interests from the whimsical nature of US domestic politics and unilateral sanctions. In the case of Iran, European companies were doing well in the renewables sector (and other major sectors in Iran). However, with the US withdrawal from the nuclear deal in 2018, China is now set to be the economic and strategic winner when it comes to Iran, especially after China and Iran signed a '25-year deal' in 2021.
- Most importantly perhaps, Europe and the Netherlands need a clear narrative and a strategy that involves both public and private involvement with regional actors in the renewable energy sector. The Benban Solar Park in Egypt, and the German public/private partnership as part of this, is a good example of such successful economic foreign policy.
- The 'European Connectivity Strategy' is a good candidate for an overarching narrative that can tie different types of discourses, practices, policies, and investments together. This strategy can play the same role for the EU as the BRI does for China.
- The chosen strategic narrative cannot only be discursive. Europe cannot solely lecture these countries about 'values' without real financial investment. Doing so will not yield economic results and ultimately such a narrative will not be embraced. Talk of values and investments should come together.
- Western private actors alone can only make sparse and sporadic investments in the region. They cannot compete with China's comprehensive and multipronged strategy. Public policy and engagement (in addition to the private actors) is needed to compete with China in the MENA region, or any other region for that matter.
- As part of a systematic economic foreign policy, the EU and the Netherlands could consider co-investing with China in MENA countries. China has been open to co-investment with Western partners in the region's renewable sector. This will have advantages for European actors, allowing them to co-develop the global strategic narrative, to objectively evaluate the progress of projects, to control project quality, and to observe the social and economic sustainability of projects.

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