Lessons from Gulf Cooperation Council Countries’ Participation in the Clean Development Mechanism

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Lessons from Gulf Cooperation Council Countries' Participation

Summary and Key Messages

Carbon markets have rapidly risen on government and corporate agendas in the Gulf Cooperation Council (GCC) countries as the region gears up to implement the Paris Agreement and pursue ambitious net-zero greenhouse gas (GHG) emission targets. Governments have expressed interest in participating in international carbon markets in their most recent nationally determined contributions (NDCs), various major companies across the region have set ambitious emission reduction targets, and three GCC countries have begun developing voluntary carbon market standards or marketplaces.

Although not among the most active participants, GCC countries have a history of engagement with international carbon markets through the Kyoto Protocol’s Clean Development Mechanism (CDM), on which this study focuses. The aim of this study is twofold: it documents the GCC region’s experience with the CDM and related project development, and it identifies related lessons that can help the region re-engage with carbon markets in the Paris Agreement era. The study draws from the literature on the CDM, publicly available CDM project data, and regional stakeholder accounts. The latter, which comprise 17 semistructured interviews with regional and international carbon market stakeholders, constitute the major empirical component and novel contribution of the study.

This study fills a gap in the literature on the CDM by identifying lessons learned from CDM projects developed in the GCC countries. It begins by explaining the relevance of the CDM and related project experiences for post-2020 carbon markets. It then provides a brief overview of the global experience through a summary of the literature on CDM lessons. This is followed by a review of registered CDM projects in the GCC region. The major contribution of the study, which is based on interviews with regional and international carbon market stakeholders (project proponents and consultants, designated national authorities, verifiers/validators, aggregators, and other experts), is that it documents experiences and distills lessons from CDM project development in the GCC region. Building on this research, the study presents an analytical summary of the main features of the region’s participation in the CDM, distills lessons learned, and discusses the implications for GCC countries’ future participation in carbon markets.

The study generates the following main lessons:

1. **Early entry into the market can deliver various benefits.**
   The GCC countries’ late entry into the CDM market translated into lost opportunities in the early years of the mechanism when certified emission reduction (CER) prices were significantly higher. Today, the region looks radically different, and early action in institutional development, awareness and capacity building for market participation and an early start in developing new crediting projects are still possible.

2. **Revenues from credit sales ultimately matter.**
   Even if financial returns were not the GCC region’s primary motive for participating in the CDM, the post-2012 fall in CER prices demonstrated that international reputation and visibility were not sufficient to drive a meaningful scaling up of crediting projects in the GCC. Developing a well-functioning mechanism for balancing the market will be a crucial success factor.
Summary and Key Messages

3. **Consistent government attention and facilitation can be crucial.**
   More projects might have made it through to registration and issuance had governments more actively and consistently promoted CDM participation. Governments can also play a major positive role in supporting markets by removing regulatory barriers, actively facilitating crediting project development, and understanding what drives market participants.

4. **Governments should also actively foster a level playing field.**
   Diversity of market participants on the demand and supply sides both supports market stability and maximizes the potential of this climate policy tool. Governments can provide targeted participation incentives to smaller companies and players. One way to start can be to set up platforms or networks where industry pioneers can share lessons and best practices. Governments can also improve markets by creating environments that ensure transparency in areas such as tendering and data disclosures, encouraging the sharing of information and discouraging unhealthy competition among the various market participants.

5. **Awareness-raising and fostering specialized expertise are further key government tasks.**
   Lack of CDM-specific expertise and lack of knowledge were both major obstacles to scaling up projects in the GCC. Governments should develop channels and materials to communicate how different types of carbon markets function and how they are planning to develop these markets. A strong market understanding among GCC governments and project owners is important. In addition, governments could actively foster the emergence of a community of local consultants.

There is general optimism among stakeholders regarding the future potential of carbon markets to support GCC countries in their net-zero transitions by creating business opportunities on the supply side and supporting cost-effective mitigation on the demand side of the market. Early engagement will be key for the region to position itself favorably in the post-2020 era. Most importantly, the study confirms that government leadership will be crucial in paving the way for businesses to engage successfully and meaningfully. The first necessary steps are establishing the necessary regulatory systems and market frameworks, building capacity across the board, fostering local market ecosystems, and initiating pilot projects.
Introduction

Carbon markets have rapidly risen on government and corporate agendas in the Gulf as the region gears up to implement the Paris Agreement and pursue ambitious net-zero greenhouse gas (GHG) emission targets. To date, none of the Gulf Cooperation Council (GCC) countries has implemented a carbon tax or a government-regulated carbon market mechanism, but all six have expressed interest in participating in international carbon markets in their most recent nationally determined contributions (NDCs) (Luomi 2022).

Over the past few years, various major companies across the Gulf have set ambitious emission reduction targets and, as a result, are expected to create an important source of demand for voluntary carbon market (VCM) credits. Reflecting this trend, at least three GCC countries—Qatar, Saudi Arabia and the United Arab Emirates—have begun developing VCM standards or marketplaces. In parallel, governments are gearing up to participate in international carbon market cooperation under Articles 6.2 and 6.4 of the Paris Agreement, which will require careful coordination between their NDC implementation and companies’ VCM participation.

The development of carbon markets and related enabling conditions in the GCC region will also require a significant amount of institution-building and human capacity. Past experiences and lessons can be invaluable resources in this endeavor. This study makes a much-needed contribution to the literature on international carbon markets, which has largely overlooked the Gulf region over the past decade. Although not among the most active participants, GCC countries have a history of engagement with international carbon markets through the Kyoto Protocol’s Clean Development Mechanism (CDM), on which this study focuses.

The aim of this study is twofold: it documents the GCC region’s experience with the CDM and related project development, and it identifies related lessons that can help the region re-engage with carbon markets in the Paris Agreement era. The study draws from three types of sources: literature on the CDM, publicly available CDM project data, and regional stakeholder accounts. The latter, which comprise 17 semistructured interviews with regional and international carbon market stakeholders, constitute the major empirical component and novel contribution of the study.

This paper begins by explaining the relevance of the CDM and related project experiences for post-2020 carbon markets. It then provides a brief overview of the global context through a summary of the literature on CDM lessons. This is followed by a quantitative review of CDM projects that have been registered in the region. The subsequent section documents stakeholder views and experiences and distills lessons from CDM project development in the GCC region. It also draws from the interviews to explore the potential for moving forward with carbon markets in the region. The paper closes with a summary of the main findings.

Post-2020 Relevance of the CDM

The CDM was one of the three flexible mechanisms under the Kyoto Protocol that provided options for companies and countries that wanted to use market-based mechanisms to support their GHG emission reduction target achievement. The CDM was established in 1997 and has been formally operational since 2006.¹ Sales of certified emission reductions (CERs)—each equaling one tonne of carbon dioxide equivalent (CO₂e)—were tied mainly to the two commitment periods of the Kyoto Protocol (2008–2012 and 2013–2020). In the post-2020 era, a new mechanism was established under the

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Paris Agreement that builds on the CDM and will effectively replace the mechanism. Consequently, as of 2021, the registration of new CDM projects was no longer been possible.  

At present, attention in international regulated carbon markets is focused largely on the future of cooperative market-based approaches under the Paris Agreement, including the CDM successor known as the Article 6.4 mechanism. However, the CDM has built a significant legacy that in many ways informs related developments and therefore deserves attention. First, the CDM developed and refined the rules, modalities and governance systems on which its successor, the Article 6.4 mechanism, largely builds. Second, the CDM has been the largest single project-based carbon market mechanism in the world, delivering close to 7,850 registered projects, 356 registered programs of activities (PoAs), more than 2.17 billion issued CERs, and over US$300 billion in investment in developing countries worldwide (UNFCCC 2018, 2021). Third, for the great majority of developing countries, the CDM remains the only regulated carbon market mechanism that they have engaged with, which means that their future participation in domestic or international carbon markets will, at least to some extent, build on their CDM experience.

Five of the six GCC countries—all but Bahrain—are among the more than 100 developing countries (also known as non-Annex I countries) that host registered CDM activities (UNFCCC 2018). In absolute terms, a large share of CDM projects was concentrated in a handful of major emerging economies (China, India, Brazil and Mexico), but a number of smaller developing countries also engaged in significant ways.

For non-Annex I countries, which in the Kyoto era did not have quantified emission reduction targets and served as host countries for CDM projects, financial returns that private sector companies could potentially obtain through the sale of CERs featured among the main participation incentives (see, e.g., Lütken [2008]). Renewable energy projects in particular benefited from the CDM, but the mechanism’s more than 250 methodologies also enabled project development in a wide variety of other energy- and non-energy-related areas. In addition to generating employment via projects, it led to the development of a major area of specialized consulting; the UN Framework Convention on Climate Change (UNFCCC) secretariat estimated that there were “over 700 CDM consulting firms and countless CDM experts worldwide” in 2018 (UNFCCC 2018).

The CDM also created institutional legacies: to the present day, most countries in the world host a CDM designated national authority (DNA), which serves as the link between companies and governments, approving projects and ensuring their contribution to sustainable development in the host countries. All GCC countries set up DNAs, and in most cases, these are expected to continue to play a role in the Paris Agreement era, with expanded responsibilities.

Finally, important aspects and innovations of the CDM are transitioning directly or indirectly to the Paris Agreement era. For example, the Article 6.4 mechanism will be governed centrally under the authority of the Paris Agreement’s supreme governing body, the “CMA,” and operated by a supervisory body (Espelage et al. 2022). The project cycle and crediting methodologies will build largely on those of the CDM, and shares of proceeds will similarly be allocated to climate change adaptation in developing countries. Some transition of old CDM activities to the Article 6.4 mechanism will also be allowed under clearly defined conditions, including that the projects were registered after 2012 and that the transition is approved by the host country (Espelage et al. 2022).
Methodology and Structure of the Paper

This paper is structured as follows: section 2 starts with a literature review, which collects common themes and lessons from global and region-specific academic and technical literature. Section 3 presents a quantitative analysis of the GCC countries’ CDM participation based on data on CDM projects and PoAs worldwide. The main source of data was the CDM/JI Pipeline Analysis and Database, which is maintained and updated monthly by Joergen Fenmann of the UNEP Copenhagen Climate Centre (Fenmann 2022a, 2022b). Data were also retrieved from the UNFCCC’s CDM Registry (UNFCCC 2022c).

Figure 1. CDM project cycle and related stakeholder roles.

Section 4 builds on 17 semistructured interviews with professionals who have engaged with CDM projects and governance in the GCC region. The interviewees represented various stakeholder roles, including project proponents, CDM consultants, governance and policy consultants, DNAs, designated operational entities (project validators/verifiers), and international market experts (Figure 1 provides an illustration of the main stakeholders’ roles in the CDM project cycle). The interviews lasted on average 45–60 minutes and were conducted via video conference and in person in June–August 2022.

The interviews focused on collecting information and stakeholder perceptions regarding various
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aspects of CDM market participation, such as project characteristics and structural and actor-related factors affecting project development. Via the interviews, the study authors also sought to distinguish characteristics and factors that were unique to the GCC region's experience. The interviews further gauged participants' views on lessons learned from CDM participation based on their personal experiences.

Section 4 distills the findings from the interviews into three sections:

- Features of the CDM experience in the GCC countries
- Lessons learned
- Looking forward

The section also puts forward recommendations for governments and other market stakeholders that can build on the lessons identified in the Paris Agreement era. The concluding section summarizes the main findings of the study.
The following literature review is divided into two parts: the first part identifies aspects that have commonly been cited as the successes and shortcomings of the CDM, which impacted developments at the project level worldwide. The second part highlights project-level lessons captured in both global and Gulf and Middle East-specific literature to date.

Successes and Shortcomings at the Global Level

The CDM was launched in 1997 as an integral part of the Kyoto Protocol. The treaty text outlines two main objectives for the mechanism: assisting non-Annex I countries in achieving sustainable development and contributing to the objectives of the UNFCCC and assisting Annex I countries in achieving compliance with their Kyoto Protocol emission reduction commitments (UNFCCC 1997). Participation was voluntary and allowed for both private and public entities. Real, measurable and long-term mitigation benefits and additionality (namely, that reductions in emissions would be additional to any that would occur in the absence of the registered CDM project activity) were defined as core characteristics of CDM project activities (UNFCCC 1997).

The CDM and the global market around it were built through a learning-by-doing approach (UNFCCC 2018), which enabled it to become operational relatively quickly after its implementation rules had been agreed upon. This, however, led to a number of issues in its initial years that the CDM subsequently sought to fix. These were related to a bureaucratic project approval process, high transaction costs, and challenges associated with projects' environmental integrity, among others.

The corrections that were made in response helped strengthen and improve the mechanism in many ways.

Three commonly cited successful aspects, or positive legacies, of the CDM were already discussed in section 1.1 of this study: a robust set of rules, modalities and governance systems; 2.17 billion issued CERs and over US$300 billion in investment in developing countries; and tangible experiences with carbon market mechanisms for the majority of countries in the world. In addition, studies of Brazil’s specific experience, for example, suggest that the early stages of the CDM in particular generated a number of positive legacies. First, it helped scale up new technologies and energy sources in the areas of landfill emissions, small-scale hydropower, and biomass power generation, among others (Witkowski Frangetto, Veiga, and Luedemann 2019). Second, it helped raise awareness and change perceptions of the importance of long-term strategic planning and structured climate change governance and foster a culture of stakeholder consultations among both corporations and governments. Third, by allowing stakeholders to contribute to the development of new project methodologies, the CDM also contributed to creativity and innovation in carbon markets (ibid.).

The CDM also attracted a large amount of criticism, and it had a number of broadly recognized shortcomings. One important weakness was that it relied on a small set of buyers for credit demand. The US, which was originally expected to be the largest source of demand (World Bank 2018), never joined the Kyoto Protocol, and the EU accounted for the lion’s share of CER demand: at the beginning of 2012, 77% of all issued CERs had been transferred to accounts in Europe (Shislov 2012).
From 2013 onward, the EU closed the doors to most CDM projects registered after 2012 due to an oversupply of allowances following the 2008 financial crisis and the perception that the mechanism had become “a subsidy paid by European industry to its competitors in emerging economies” (ibid., 18). Japan, which had been the second major source of demand, also closed the door to CERs after 2012 (Kainou 2022). As a result, CER demand, and consequently prices, dwindled, never to recover (see Figure 2). Low ambition and more limited participation by developed countries in the Kyoto Protocol’s second commitment period (2013–2020) also contributed to the problem (Michaelowa et al., 2021). After 2012, the CDM continued to suffer from lengthy procedures, complex regulation and high transaction costs, which further discouraged project development (World Bank 2018).

Distributional imbalances on the supply side were also seen by many as a weakness. Challenges included a concentration in terms of project types and host countries on “inexpensive, high-volume projects’ in a few newly industrialized states in Asia and Latin America” (Lövbrand, Rindefjäll and Nordqvist 2009, 82 (quotation); Shislov and Bellassen 2012). Additionally, while the CDM was originally designed to promote both sustainable development and emission reductions, the fact that the former went “unpriced” and was left to each host country’s judgment meant that broader sustainable development benefits did not feature as a high priority in CDM project development (ibid.; Boyd et al. 2009; Shislov and Bellassen 2012; Holm Olsen, Arens and Mersmann 2018).

Many have observed that the CDM did not deliver on some of its original objectives, including meeting

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**Figure 2.** Average CER prices in 2004–2021 (US$ per 1 tonne of CO$_2$e).

Source: Michaelowa (2022).

Note: Primary CER prices reflect the prices of CERs purchased directly from a project.
the additionality requirements or exploiting the potential for lower abatement costs in developing countries or leveraging finance and promoting technology transfer to them. Lütken (2008) observed early on that projects that relied on more than one revenue stream (e.g., from power generation and from carbon credits) likely would have gone forward in any case. Additionally, instead of delivering financing from the North to the South, the CDM generated large quantities of “non-investment-based ‘commodity credits’ (i.e. CERs) from projects that, from an investment perspective, are in many cases comparable to similar projects in an Annex-I context” (ibid., 85). The majority of CDM projects were financed “unilaterally” by project participants (i.e., no proponent was listed for offset purchases at the time of project registration) in the host countries. Additionally, most projects saw little technology transfer because local investors’ motivation “to adopt non-domestic technologies on normal commercial terms is limited, being expensive, unfamiliar or even unknown” (ibid., 86). Furthermore, Schmid (2013) found that while unilateral CDM project financing benefited developing countries by granting them direct access to CER revenues, it also contributed to inequitable project distribution among countries as access to domestic credit (and lower capital costs) emerged as a determining factor in facilitating self-financing.

Project-Level Lessons

In terms of scaling up projects at the country level, the global CDM literature (Sippel and Michaelowa 2009; Lövbrand, Rindefjäll, and Nordqvist 2009, 82; Song 2010; Witkowski Frangetto, Veiga, and Luedemann 2019) has highlighted numerous factors that limited project developers’ appetite or reduced the chances of delivering successful projects in addition to the low credit prices that plagued the CDM from 2013 onward. These included a lack of technical know-how to develop CDM projects; the mechanism’s long, slow and bureaucratic project cycle; and the lack of regulatory certainty (and consequently market stability) over longer periods of time. In addition, certain types of projects, including energy efficiency and fuel switching, appeared to be more easily rejected due to difficulties in proving additionality and constrained applicability of available methodologies. For various reasons, few registered projects focused on buildings, transport, agriculture and forestry, among others.

The literature (Song 2010; Shislov and Bellassen 2012; Michaelowa 2012; Witkowski Frangetto, Veiga, and Luedemann 2019) has also identified common factors that generally favored project development and success in host countries, including the following:

- The existence of sites of significant sources of emissions from which larger-scale reductions could be more easily generated (particularly in the earlier stages of the mechanism);
- Having the necessary institutional frameworks in place early on;
- The supportiveness and experience of the CDM DNA in promoting the mechanism and overall strong institutional capacity;
- A favorable investment environment;
- Capacity building, including by international institutions and other partners; and
- Experienced project design document (PDD) developers and well-prepared PDDs as well as the choice of a designated operating entity (validator).
The GCC region’s experiences with the CDM have scarcely been documented. A thorough review by the authors found no studies that focused specifically on the GCC countries’ experiences with CDM projects. Previous studies have generally either referred to the CDM as part of a broader focus on climate change and energy transition policies in the GCC (e.g., Alnaser and Alnaser [2011]; Mezher, Dawelbait, and Abbas [2012]; Luomi [2014]) or discussed the CDM in a broader regional context, referring to the Middle East or the Arab region without examining the GCC specifically (e.g., Flamos et al. [2007]; Laurence [2008]; Zafar [2020]). Egypt, host to 21 registered CDM projects, has also received some country-specific attention (e.g., Gelil [2009]; [2010]; [2014]; Sowers [2013]; Abdulrahman, Huisingh, and Hafkamp [2015]). Only Michaelowa et al. (2014) examined the potential of various post-2012 carbon market and mitigation financing approaches in the GCC through a detailed case study of Saudi Arabia.

The above-cited studies appear to concur on a number of barriers and challenges to CDM project development that were common to the Middle East and North Africa region:

- Market uncertainties (decreasing CER prices from 2013 on) and high CDM transaction costs;
- Institutional barriers at both the international (long CDM project cycle) and domestic (late establishment of CDM DNAs) levels;
- Regulatory gaps (including those relating to landownership, technology transfer and liability);
- Low political prioritization of GHG mitigation (few incentives for, e.g., renewables), inconsistent approach by governments to encouraging CDM participation, and low awareness of the mechanism’s benefits among other CDM stakeholders;
- Gaps in capacity in government (relating to, inter alia, project financing) and the private sector/companies (project identification, development and implementation); and
- Lack of methodologies (in the specific case of carbon capture and storage [CCS]).

- Structural economic disincentives (low energy prices) and financing models (lack of support from financial institutions);
This section presents an analysis of CDM projects in the GCC region based on quantitative data available via the UNEP CDM pipelines and the UNFCCC CDM registry.7

In total, the GCC countries host 28 registered CDM projects and three PoAs.8 Some countries were more active than others, with the UAE and Saudi Arabia together accounting for 21 projects and all PoAs, while Bahrain did not develop a single project. Registered CDM projects and PoAs in the GCC account for 0.50% of the global total volume of projects and PoAs based on their annual reduction potential in their first crediting period: 5.67 MtCO$_2$e/year out of 1,138.07 MtCO$_2$e/year.9 For a simple comparison, the GCC countries’ total GHG emissions in 2012 (the median year of the 28 CDM projects’ registration date) accounted for 4.08% of developing (UNFCCC non-Annex I) countries’ total emissions (WRI et al. 2022).

Table 1 provides an overview of GCC countries’ registered projects and PoAs.

<table>
<thead>
<tr>
<th>Registration date</th>
<th>Host country (/emirate)</th>
<th>Project type/ subtype or policy (PoAs)</th>
<th>Project or PoA/activity title</th>
<th>Annual reduction potential, ktCO$_2$e (1st crediting period)</th>
<th>Thousand CERs issued (total)</th>
<th>PDD or PoA consultant</th>
<th>Credit buyer</th>
</tr>
</thead>
<tbody>
<tr>
<td>29-May-07</td>
<td>Qatar</td>
<td>Fugitive/ oilfield flaring reduction</td>
<td>Al-Shaheen Oil Field Gas Recovery and Utilization Project</td>
<td>2,500</td>
<td>12,750</td>
<td>EcoSecurities</td>
<td>UK (Morgan Stanley)</td>
</tr>
<tr>
<td>8-Jun-09</td>
<td>UAE/Abu Dhabi</td>
<td>Solar/PV</td>
<td>ADFEC 10 MW Solar Power Plant</td>
<td>15</td>
<td>12</td>
<td>Masdar</td>
<td></td>
</tr>
<tr>
<td>11-Jul-09</td>
<td>UAE/Ras Al-Khaimah</td>
<td>Landfill gas/ power</td>
<td>Biogas Technology Group Ras Al-Khaimah Landfill Gas to Energy Project</td>
<td>40</td>
<td>90</td>
<td>EcoSecurities</td>
<td>UK (Biogas Technology, EcoSecurities)</td>
</tr>
<tr>
<td>13-Aug-09</td>
<td>UAE/Abu Dhabi</td>
<td>Solar/thermal</td>
<td>Abu Dhabi solar thermal power project, Masdar</td>
<td>175</td>
<td></td>
<td>Masdar</td>
<td></td>
</tr>
<tr>
<td>9-Oct-09</td>
<td>UAE/Abu Dhabi</td>
<td>EE supply side/waste heat use</td>
<td>Low-pressure steam generation by recovering waste heat using heat reclaimers at Emirates CMS Power</td>
<td>119</td>
<td>476</td>
<td>Emirates CMS Power Company</td>
<td>Switzerland (Vitol)</td>
</tr>
<tr>
<td>Date</td>
<td>Location</td>
<td>Sector</td>
<td>Description</td>
<td>CDM Factor</td>
<td>CDM Units</td>
<td>Company/Project Details</td>
<td></td>
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<tr>
<td>25-Feb-11</td>
<td>UAE/Abu Dhabi</td>
<td>EE industry/ petrochemicals</td>
<td>Implementing energy-efficiency measures to reduce fuel gas consumption at GASCO</td>
<td>8</td>
<td>2</td>
<td>Abu Dhabi Gas Industries</td>
<td></td>
</tr>
<tr>
<td>23-Jul-12</td>
<td>Saudi Arabia</td>
<td>Landfill gas/ flaring</td>
<td>Madinah Landfill Gas Capture Project</td>
<td>139</td>
<td></td>
<td>Caspervandertak Switzerland (Vitol)</td>
<td></td>
</tr>
<tr>
<td>3-Aug-12</td>
<td>UAE/Dubai</td>
<td>EE households/ lighting</td>
<td>Dubai CFL Project</td>
<td>24</td>
<td></td>
<td>Energy Changes/Dubai Carbon Centre of Excellence (DCCE)</td>
<td></td>
</tr>
<tr>
<td>10-Aug-12</td>
<td>UAE/Dubai</td>
<td>Solar/PV</td>
<td>10 MW Photovoltaic Plant in Dubai, UAE</td>
<td>13</td>
<td>11</td>
<td>Energy Changes/DCCE</td>
<td></td>
</tr>
<tr>
<td>13-Sep-12</td>
<td>UAE/Dubai</td>
<td>EE industry/ nonferrous metals</td>
<td>Regenerative Burners for Melting Furnaces</td>
<td>10</td>
<td></td>
<td>Energy Changes/DCCE</td>
<td></td>
</tr>
<tr>
<td>21-Sep-12</td>
<td>UAE/Ras Al-Khaimah</td>
<td>EE own generation/ cement heat</td>
<td>UCC RAK Waste Heat Recovery</td>
<td>59</td>
<td></td>
<td>Energy Changes/DCCE</td>
<td></td>
</tr>
<tr>
<td>8-Nov-12</td>
<td>Saudi Arabia</td>
<td>Landfill gas/ flaring</td>
<td>Jeddah Old Landfill (JOLF) and Jeddah New Landfill (JNLF) Landfill Gas Recovery Bundled Project</td>
<td>355</td>
<td></td>
<td>Scott Wilson UK (Shell Trading)</td>
<td></td>
</tr>
<tr>
<td>14-Nov-12</td>
<td>UAE/Dubai</td>
<td>EE service/air conditioning</td>
<td>DEWA Chiller Station L</td>
<td>27</td>
<td>95</td>
<td>Energy Changes/DCCE</td>
<td></td>
</tr>
<tr>
<td>19-Nov-12</td>
<td>UAE/Dubai</td>
<td>Landfill gas/ flaring</td>
<td>LFG flaring project at Dubai, UAE</td>
<td>269</td>
<td>1302</td>
<td>First Climate Norway (Ministry of Finance)</td>
<td></td>
</tr>
<tr>
<td>7-Dec-12</td>
<td>Saudi Arabia</td>
<td>Solar/PV</td>
<td>Solar Power Project at North Park Building</td>
<td>10</td>
<td></td>
<td>Ernst &amp; Young</td>
<td></td>
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<tr>
<td>17-Dec-12</td>
<td>UAE/Abu Dhabi</td>
<td>Wind/wind</td>
<td>Sir Bani Yas Wind Farm Project</td>
<td>20</td>
<td></td>
<td>Masdar</td>
<td></td>
</tr>
<tr>
<td>23-Dec-12</td>
<td>Kuwait</td>
<td>Fugitive/ oil and gas processing flaring</td>
<td>“Flare gas recovery unit 105” project in MAA refinery, KNPC</td>
<td>54</td>
<td>158</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Location</td>
<td>Technology</td>
<td>Description</td>
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<tr>
<td>24-Dec-12</td>
<td>UAE/Abu Dhabi</td>
<td>Solar/PV</td>
<td>Nour 1 PV Project</td>
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<td>29-Dec-12</td>
<td>UAE/Abu Dhabi</td>
<td>Fugitive/oil field flaring reduction</td>
<td>Flare gas reduction through spiking compressor at Shah</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>31-Dec-12</td>
<td>Oman</td>
<td>Fugitive/oil field flaring reduction</td>
<td>Associated Gas Recovery and Utilization at Block 9</td>
<td></td>
<td></td>
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<tr>
<td>25-Jan-13</td>
<td>Oman</td>
<td>Methane avoidance/ aerobic treatment of wastewater</td>
<td>Waste Management Project at Al Amerat</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>13-Feb-14</td>
<td>Kuwait</td>
<td>Fugitive/oil field flaring reduction</td>
<td>Flare Gas Recovery Facilities Project in Unit 49 of MAB Refinery—KNPC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-Apr-14</td>
<td>Saudi Arabia</td>
<td>EE service/commercial buildings</td>
<td>Installation of a tri-generation system supplying energy to a commercial building</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17-Jul-14</td>
<td>Saudi Arabia</td>
<td>EE supply side/steam boiler</td>
<td>Efficiency Improvement by Boiler Rehabilitation in Fossil Fuel-Fired (Natural Gas) Steam Boiler System</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8-Jul-15</td>
<td>Qatar</td>
<td>EE supply side/waste heat use</td>
<td>Medium-Pressure Steam Condensate Water Recovery</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>12-Oct-15</td>
<td>UAE/Dubai</td>
<td>Solar/PV</td>
<td>Dubai 100 MW Photovoltaic Plant</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>29-Nov-16</td>
<td>Saudi Arabia</td>
<td>EE supply side/higher-efficiency steam</td>
<td>Boiler Second Economizer in Yansab, Kingdom of Saudi Arabia</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
### CDM Projects in the GCC

<table>
<thead>
<tr>
<th>Date</th>
<th>Country</th>
<th>Description</th>
<th>Associated Gas Recovery and Utilization at Khamilah Oil Field Area at Block-27 in Wilayat Ibi of the Sultanate of Oman</th>
<th>432</th>
<th>258</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Aug-20</td>
<td>Oman</td>
<td>Fugitive/oil field flaring reduction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28-Dec-12</td>
<td>Saudi Arabia</td>
<td>Development of renewable energy projects</td>
<td>Renewable Energy Programme of Activities in Middle East and North Africa/1 MW Solar Project at Bahrah and 12.6 MW Solar PV Layla Project</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TOTAL</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,618</td>
<td>15,904</td>
</tr>
</tbody>
</table>

**CDM PoAs**

**Source:** Based on Fenhann (2022a, 2022b).

**Note:** The table excludes at least one recently registered PoA that is not documented in the UNEP database, namely, the 316 MW Sakaka solar photovoltaic plant in Saudi Arabia, included in 2020, with an annual reduction potential of 610 tCO$_2$e.
Figure 3 provides a graphic illustration of the broader CDM landscape in the GCC. It shows a country-based breakdown of the annual reduction potential of all CDM projects that were initiated (based on the projects’ first crediting period), projects that were registered, and registered projects that issued CERs (note: the latter does not equal the number of credits issued, which is displayed in Table 1).

In a global comparison, at a project level, the region’s CDM projects have a slightly higher average potential reduction capacity than the global average, 201 ktCO₂e/year and 129 ktCO₂e/year (1st period), respectively. Data on investments are not available for all registered projects, but the average of those for which data exist in the GCC is US$1,816/tCO₂e. This is close to the global average of US$1,661/tCO₂e. Worldwide, a large number of CDM projects were initiated but did not make it through registration due to rejection, replacement, withdrawal or termination of validation. Here, too, the GCC is relatively close to the global average: the GCC countries’ registered CDM projects represent 57.14% of all their projects in the CDM pipeline, while the corresponding global share is 62.78%.

In some metrics, the GCC countries benefited less from the CDM than did many other emerging economies. One way to measure this is to compare annual expected emission reductions from CDM projects with countries’ total GHG emissions. The total average annual GHG emission reduction potential generated by the GCC’s registered

![Figure 3. Overview of GCC CDM projects’ reduction potential from initiation through issuance.](image-url)

Source: Authors, based on Fenhann (2022a).
Note: Column totals may display nonsignificant differences due to rounding.
CDM Projects in the GCC

CDM projects and PoAs during their first crediting period was 5.67 MtCO$_2$e. It is important to keep in mind that this assumes that all projects remained operational after registration, which stakeholders suggested was not always the case. The five GCC countries’ total GHG emissions in 2012 (the median year of the 28 CDM projects’ registration date) are estimated as 1,152.2 MtCO$_2$e (WRI et al. 2022). The resulting CER share of total emissions is 0.49%. For comparison, the equivalent shares for China, India and Brazil are 5.61%, 5.78%, and 4.35%, respectively.\(^{10}\)

One explanation for these lower shares is that the group was a relative latecomer to the market, with most of its projects registered in or after 2012, when CER demand and prices had already crashed. Figures 4a and 4b show when CDM projects were registered, globally and in the GCC.

Another way to measure success in engaging with the CDM is to examine credit issuances. Only a small share of CDM projects’ reduction potential globally has been issued as transferable credits or CERs, each equivalent to 1 tCO$_2$e (see Table 1). One reason was the dramatic fall in CER prices in 2012, from US$10 or more to US$1 or less per tonne, after which prices never recovered (see Figure 2). Assuming that registered CDM projects remain active through 2025, they will collectively

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**Figures 4a and 4b.** Registrations of CDM projects globally and in the GCC, 2005 to June 2022.

Source: Authors, based on Fenhann (2022a).
and cumulatively since their registration have helped reduce emissions by 9,348.63 MtCO$_2$e—roughly the equivalent of one-fifth of current global annual GHG emissions. By July 2022, 2,189.67 million CERs had been issued worldwide, resulting in an issuance-to-expected cumulative reduction ratio of 23.42%. In the GCC, this cumulative reduction potential was 52.34 MtCO$_2$e. With 15.90 million CERs issued, the ratio for the GCC was higher at 30.39%. However, if the Al-Shaheen project in Qatar, which issued 80.17% of these credits, is excluded, this ratio falls to 11.94%.

A third way to measure success is to examine financial returns to project owners. Not all issued CERs have been sold. Additionally, credits sold prior to the 2012 crash captured a significantly higher price than those issued after 2012. Unfortunately, data on actual credit sales are not readily available. The UNFCCC CDM portal, however, provides information on the early involvement of other project parties, which indicates a potentially higher likelihood of the credits being sold. Based on the UNFCCC portal, 11 out of 32 registered GCC CDM projects and PoAs enlisted other project parties involved, which in most cases were international carbon aggregators and trading companies (UNFCCC 2022c). The remaining projects were developed unilaterally with no involvement of potential carbon credit buyers.

The GCC countries can also be examined as CER buyers. After the CER price crash of 2012, a new system of voluntary cancellations was set up that allowed CERs to be utilized for compensation in the voluntary market. For example, companies that wished to become carbon neutral could retire CERs for that purpose. This created a new source of voluntary demand for credits. Additionally, many emerging economies, including China, Mexico and South Africa, decided to allow CERs to be used toward domestic emission trading schemes or carbon tax obligations, which also helped revive demand to some extent (Kainou 2022), even though CERs were still traded at very low prices [see Figure 2]). By the end of 2021, 4.5 million CERs had been voluntarily cancelled by governments, companies and individuals (UNFCCC 2002c). From CDM projects based in the GCC, approximately 300,000 CERs had been voluntarily cancelled as of September 2022 (see Table A.1 in the appendix). The majority of these (292,000 CERs) came from two gas projects in Oman and a boiler efficiency improvement project in Saudi Arabia. These were utilized toward upstream emission reductions under the European Fuel Quality Directive and voluntary operational carbon neutrality obligations by the host company, respectively.

A further way to compare the GCC to the rest of the world is to examine the types of projects that were registered. Here, the GCC stands out for its higher number of oil and gas industry methane reduction and energy-efficiency projects compared to renewable energy projects and the larger average size of methane reduction projects. Possible explanations are that the GCC countries are oil and gas-producing countries (hence the focus on this industry) and, related to this, have traditionally preferred to target energy efficiency over renewable energy as the first climate change mitigation measure.

Globally, in terms of both the number of projects and reduction volume, renewable energy, in particular wind, hydropower, solar and bioenergy, accounts for the majority of all registered projects: 5,713 (573.5 MtCO$_2$e/year, first crediting period) (see Figure 5a). This is followed by methane emission reduction projects related to landfill gas, coalbed methane, fugitive emissions, and the cement industry (1,192 projects, 152.51 MtCO$_2$e/year), energy efficiency (622 projects, 85.52 MtCO$_2$e/year), and GHG gases other than CO$_2$ and methane (138 projects, 141.29 MtCO$_2$e/year). For a detailed breakdown of projects by category and number, see Table A.2 in the Appendix.
CDM Projects in the GCC

Figures 5a and 5b. Total annual reduction capacity of registered CDM projects globally and in the GCC by category, 1st crediting period, ktCO₂e/year.

(a) CDM projects globally

<table>
<thead>
<tr>
<th>Renewable energy</th>
<th>Methane and chemicals</th>
<th>Hydrofluorocarbons (HFCs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro 272,817.7</td>
<td>Landfill gas 54,884.9</td>
<td>HFCs 81,318.7</td>
</tr>
<tr>
<td>Wind 228,380.6</td>
<td>Coal bed/ mine methane 36,316.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fugitive 31,390.4</td>
<td>N₂O 57,153.9</td>
</tr>
<tr>
<td></td>
<td>Methane avoidance 25,062.3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cement 3,858.4</td>
<td></td>
</tr>
<tr>
<td>Biomass energy 44,847.0</td>
<td>Energy efficiency</td>
<td>Fuel switching</td>
</tr>
<tr>
<td>Solar 15,065.9</td>
<td>EE own generation 45,281.7</td>
<td>Fossil fuel switch 56,075.1</td>
</tr>
<tr>
<td>Geothermal 11,608.3</td>
<td>EE supply side 27,218.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Energy distribution EE</td>
<td>EE ho...</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transport</td>
</tr>
</tbody>
</table>

(b) CDM projects in the GCC

<table>
<thead>
<tr>
<th>Methane and chemicals</th>
<th>Renewable energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fugitive 3,962.6</td>
<td>Solar 489.3</td>
</tr>
</tbody>
</table>

Energy efficiency

EE own gen... 192.0
EE se... h...
EE...

Source: Authors, based on Fenhall (2022a).
Ten of the 28 CDM projects in the GCC were in the field of energy efficiency, seven were renewable energy projects (wind or solar), and the rest focused on methane reduction in the oil gas industry, landfills and wastewater treatment. Oil and gas industry fugitive emissions (3.96 MtCO$_2$e/year) and landfill gas (0.80 MtCO$_2$e/year) projects accounted for the majority of expected reductions from all registered projects (see Figure 5b). Renewable energy (0.51 MtCO$_2$e/year) projects came next, followed by energy efficiency (0.33 MtCO$_2$e/year). (The region’s three PoAs were not included in this examination.)

Major oil-producing countries from other regions have somewhat similar characteristics: first, with the exception of Iran and Nigeria, member countries of the non-GCC Organization of the Petroleum Exporting Countries (OPEC) host either only a few or no CDM projects. Second, out of Iran’s and Nigeria’s 24 CDM projects, 13 are related to the oil and gas sector or related energy generation, and their annual reduction potential (size) accounts for 72.43% of the 24 projects’ total potential.\(^\text{12}\)

A comparison among the GCC countries reveals some interesting differences. The UAE has the most registered projects (15), but the total reduction capacity (1.16 MtCO$_2$e/year) of these projects is only the third highest within the group. Saudi Arabia ranks second in registered projects (six) but has the lowest annual reduction potential-to-total emissions ratio (4.21%). Qatar, with only two projects, has the most annual reduction potential (2.51 MtCO$_2$e/year) owing to its massive Al-Shaheen oil field gas recovery and utilization project. Because of the same project’s success in issuing 12.75 million CERs, projects in Qatar also have the highest issuance-to-expected accumulated reduction ratio (49.00%), as mentioned above.
Lessons from GCC Engagement with the CDM

This section distills key findings and messages from the 17 stakeholder interviews conducted for this study in three parts: features of the CDM experience in the GCC countries, lessons learned, and looking forward. While the interviewees came from a broad range of backgrounds and CDM project cycle roles, the majority of them were most familiar with a project or projects in a single country. Reflecting the fact that most CDM projects were registered in the UAE and Saudi Arabia, the interviewees’ experiences most often also concerned these countries, but many interviewees also had experiences with Oman and Qatar.

Features of the CDM Experience in the GCC Countries

The experiences of the interviewees can be grouped under three broad themes: (1) GCC-specific participation characteristics; (2) drivers of project development; and (3) obstacles to project development.

GCC-specific participation characteristics

Participation in global governance: The interviewees generally described the GCC countries as latecomers to the CDM. While this was the case for the establishment of both domestic support institutions and projects, the region nevertheless hosted the first international conference on the CDM in Riyadh in 2006 (IISD/ENB 2006). At that time, GCC countries were already active proponents of the acceptance of CCS projects under the CDM. In 2011, as a result of these efforts, parties to the Kyoto Protocol adopted a guidance document in this area (“modalities and procedures”; see UNFCCC 2011), but specific methodologies for CCS were never developed due to a lack of appetite from project developers. Two stakeholders attributed this problem to significant practical obstacles to CCS project development relating to assigning liability, monitoring and high project costs (particularly in the context of low CER prices). One interviewee recounted how during the 2010s, given the generally strong unity of the Arab Group, growing interest in other Arab countries in the CDM also made GCC countries more broadly supportive of the mechanism in the UNFCCC negotiations.

Differentiated institutional origins: Despite the interest in the CDM indicated in particular by Saudi Arabia during the 2006 conference (IISD/ENB 2006), CDM DNAs in the region were only set up toward the end of the 2000s. Additionally, all but two DNAs remained relatively inactive in terms of promoting CDM project development. In the two most active countries, the UAE and Saudi Arabia, CDM DNAs were set up for different reasons and driven by different actors, even though the countries’ leaders were ultimately behind both. In the UAE, the state-owned clean energy enterprise Masdar, which was established in 2006 with a strong mandate from Abu Dhabi's top leadership, began engaging with the CDM in 2008 and, as part of this process, drove the establishment of the UAE's DNA. Headquartered in Abu Dhabi, Masdar initially worked with the local environmental agency to build awareness and capacity and support the establishment of the authority. This DNA later became, in one carbon project developer's view, comparatively knowledgeable and easy to approach.

In Saudi Arabia, the establishment of the CDM DNA from 2009 onward was similarly driven by leadership vision but executed more directly and decisively by the government. According to the interviewees, significant resources and exceptional attention were dedicated to setting up the institution and to
capacity-building efforts among major stakeholders in the early years after its establishment. Soon after, however, the CER market froze, and while the government continued to make funding available for the CDM support infrastructure, project participants did not feel compelled to take action. Even so, the authority in Saudi Arabia retains the strongest capacity among DNAs in the GCC to the present day and is also responsible for emissions reporting to the UNFCCC and actively participating in negotiations.

Participation and project characteristics:
A common feature of project development in the GCC was that it was dominated by major companies and unilateral projects (albeit, as explained in section 2, the latter were also common in other regions). One participant with project development experience in the UAE commented that the unilateral approach in the GCC was motivated by companies’ perception that by developing projects themselves, they would stand to gain more financially.

As noted in section 3, while globally, renewable energy projects accounted for the largest share of both registered CDM projects and reduction potential, in the GCC, energy efficiency comprised the largest share of projects, and oil and gas industry fugitive emissions projects captured the greatest volume.

The prevalence of foreign project development consultancies was a further feature of GCC participation. There were only two homegrown consultancies that successfully delivered registered CDM projects. Both were located in the UAE: Masdar in Abu Dhabi (seven projects) and Dubai Carbon Centre of Excellence (six projects and one PoA) (UNFCCC 2022c).\(^{14}\) Masdar was also the PDD consultant for three registered projects: one in Egypt (flare gas recovery) and two in Uzbekistan (gas network leak reduction). According to stakeholders, for Masdar, technology transfer—one of the original intended benefits of the CDM—was a strong motive in its outreach to other developing countries.

Differences among and within countries: The interviewees described the GCC as a generally homogeneous region. Many, however, identified a pattern, common to many other business sectors, of the UAE being comparatively more entrepreneurial, having a larger appetite for risk and acting as the first mover and the other countries adopting a wait-and-see approach and following suit depending on the financial success of the endeavor. Some also described the UAE as a “less complex” environment for CDM project development.

A second characteristic highlighted by the interviewees was the UAE’s internal dynamics, where a familiar competition between the two wealthiest emirates, Abu Dhabi and Dubai, was also reflected in the CDM space in the form of competition among project developers. This created confusion among potential project participants and was perceived as having hindered project development overall.

Drivers of project development

Visibility and imitation: The interviewees concurred that CER revenues were not the primary motive for or driver of CDM project development in the great majority of cases in the GCC. The region’s wealth was cited as the primary reason for this. Instead, international reputation or “the neighborhood effect” (i.e., motivation arising from peers taking action) were mentioned as the leading drivers in both the UAE and Saudi Arabia. As an example of the former, one interviewee described Saudi Arabia’s promotion of project development as having been motivated by a will to be seen as open to innovative approaches to domestic mitigation.
Lessons from Gulf Cooperation Council Countries’ Participation

Lessons from GCC Engagement with the CDM

as long as these were “mobilized” and supported externally.

**Other project enablers:** The participants cited examples of state-owned and semigovernmental enterprises with strong in-house capacity that successfully developed projects, noting that the Dubai Carbon Centre of Excellence developed a new methodology for district cooling and Masdar in Abu Dhabi developed one for building efficiency. One interviewee identified the GCC region’s advanced infrastructure, good grid connectivity and the availability of financial resources as structural factors that generally favored project development.

**Obstacles to project development**

**Relatively late arrival to the market:** The later establishment of CDM DNAs led to CDM projects getting a later start in the GCC region. One interviewee recounted how in one country, a number of solar PoAs that reached an advanced stage of documentation missed the December 2012 deadline for registration (which would have enabled them to still qualify for use in the EU Emissions Trading System [ETS]) and were therefore discontinued. One expert suggested that the GCC’s relatively late arrival to the market was the reason that only major companies engaged with the mechanism: countries that had begun earlier saw larger volumes of trading, which in turn tended to incentivize smaller projects and fewer players’ participation.

**Economy-related disincentives:** One participant suggested that most CDM projects in the GCC were “more about the PR” than about capturing financial value from CER sales, thus limiting the prospects for a major scaling up of projects. The stakeholders also cited low energy prices as a major obstacle to energy efficiency and fuel switching project development: switching to lower-carbon-intensity fuels, for example, would in some cases have led to higher energy costs for industrial companies, which naturally made them uninterested.

**Fall in credit prices, loss of market trust:** At the same time, many pointed out that GCC countries were in many ways similar to the majority of developing countries in that the main hindrance to project development after 2012 was related to the global CER demand and price collapse (see section 2.1). After the price crash, some GCC actors still developed projects as “marketing opportunities,” but interest was limited by the comparatively high costs of project development. Additionally, as a result of the market collapse, the CDM lost salience for leadership figures who had actively promoted project development.

Many further noted that the price crash led to a more long-lasting loss of trust in the CDM in the region, as the market “stopped before it had properly started.” Some projects in the region either genuinely depended on or would have greatly benefited from CER revenues. Many owners and developers of these projects were disappointed by their experiences, which some interviewees feared might now influence their eagerness to engage in post-2020 carbon markets.

**Project type-specific challenges:** Many stakeholders explained the relatively low number of CDM projects in the GCC in terms of the region’s stronger emphasis on energy-efficiency and oil and gas sector projects than on renewable energy development. Renewable energy projects are generally easier to develop because they have clear project boundaries, only a view monitoring parameters are required for emission reduction calculations, and the installations are built from scratch and therefore do not require interrupting or changing existing systems or processes. For energy-efficiency and oil and gas sector projects, both the methodologies and project development
Lessons from Gulf Cooperation Council Countries’ Participation

are more complex. Moreover, oil and gas sector projects in particular have had significantly longer (five to eight years) project development times than renewable energy projects (as little as one to two years), and they quickly become unfeasible in times of low oil prices.

Disclosure concerns: The interviewees also identified as a particularly serious bottleneck oil and gas sector companies’ unwillingness to provide data for project development due to fears about how the data could be used once they became publicly available. One cited a fear that governments would introduce domestic regulations based on companies’ information disclosure as a related reason for companies’ reluctance to share information in some countries.

Disincentives created by expectations and tendering: A number of stakeholders described situations in which governmental entities’ expectations or requirements created barriers to CDM project development. One stakeholder felt that project owners in the region did not have sufficient patience to see through the somewhat lengthy CDM project cycle. Others described many tendering procedures as opaque and structured in a way that discouraged (high-quality) consultants from bidding. Examples were guarantees of continuous revenue streams from CER sales by consultants to project owners, which created a contractual risk and, in some cases, even removed the project’s financial additionality. In other cases, prospective project owners demanded a high share of credits as a reward for asset ownership, which decreased the attractiveness for a consultant to continue with the CDM project registration as well as emission reduction monitoring and verification activities.

Regulatory and governance obstacles: One stakeholder explained that the waste sector in one GCC country was structured around short-term (two- to five-year) contracts, which eliminated any prospective commercial CDM landfill gas capture and power projects, as these require a minimum operating time of ten years. Another example cited was attempts to introduce waste energy to an industrial facility being blocked due to bans on waste imports by a neighboring emirate or country. In another case, a change in local government leadership led to changes in priorities, which in turn caused delays in implementation for an already well-established project.

Low awareness and prioritization: Many interviewees viewed both a low general level of awareness of carbon markets and low prioritization and visibility of climate change on the policy agenda as major obstacles to both starting CDM projects and seeing them through to registration and issuance. Due to lower awareness, potential project owners needed “more convincing.” At the same time, as one participant noted, “very few people understood how to simplify the requirements for the clients.” As a reflection of the lower prioritization of climate change in the region at the time, one stakeholder pointed out that while major consulting companies had a presence in the GCC, their sustainability divisions generally did not. Low prioritization on the government agenda also led to lower resource allocation to DNAs, which limited their ability to play a more active role in promoting the mechanism and building stakeholders’ capacity.

Capacity: Capacity-related challenges cited by the interviewees included both a dearth of qualified project consultants and consultants’ lack of local experience. In the former case, one stakeholder commented that developers who opted for lower-quality consultants saw a negative impact on the quality of their project documentation. In the latter case, one interviewee cited the example of a large number of externally prepared CDM project proposals being rejected in a company’s internal
due diligence because of their unsuitability to the local context.

Lessons Learned

Many of the stakeholders interviewed for this study stressed the significant potential of the GCC for CDM project development, which was, and largely remains, untapped.

*Early entry into the market can deliver various benefits.*

One of the main lessons from the interviews, already captured in the previous section, is that the GCC countries’ late entry into the CDM market translated into lost opportunities in the early years of the mechanism, when CER prices were significantly higher. At least two reasons for this can be identified. First, the late establishment of the CDM DNAs, as discussed above, was a clear contributor to the later start of projects.15 However, interviewees also recalled that in the 2000s, significant international resources were dedicated to raising awareness and building capacity around the CDM in multiple developing countries and regions, including India and Latin America, which went on to develop large numbers of projects. They felt that the GCC (and the Arab region more broadly) was not as much “on the radar” of these efforts—possibly because of the region’s higher levels of wealth or because of its lower prioritization of climate change policy. Today, the region looks radically different than it did in the 2000s, and early action in all the aforementioned areas—institutional development, awareness and capacity building, and an early start in developing new crediting projects—is still possible.

*Revenues from credit sales ultimately matter.*

Although financial returns were not the GCC region’s primary motive for participating in the CDM, the fall in CER prices after 2012 demonstrated that international reputation and visibility were not sufficient to drive a meaningful scaling up of crediting projects in the GCC. Currently, many GCC countries are exploring the possibility of establishing domestic carbon markets, and a key lesson from this study is that developing a well-functioning mechanism for balancing the market will be a crucial success factor.

*Consistent government attention and facilitation can be crucial.*

In Saudi Arabia, where the government had been a strong promoter of CDM project development, some projects lost momentum following the market crash. Although this loss in interest on both sides was understandable, some interviewees felt that more projects may have made it through to registration and issuance had there been continued support to actively promote CDM participation—or carbon crediting more generally.

Another, even more crucial area, where many participants identified major obstacles for project development related to government regulation: removing regulatory barriers, actively facilitating crediting project development, and understanding what drives market participants—in particular project development consultants—are areas where governments can play a major positive role in supporting markets.

*Governments should also actively foster a level playing field.*

As highlighted by the interviewees, CDM project owners in the GCC were generally large corporations. The diversity of market participants on the demand and supply sides both supports market stability and maximizes the potential of this climate policy tool. Today, major corporations in the region, which also tend to be more exposed
to international developments through either their operations or their investors, commonly have a well-developed understanding of environmental, social and governance (ESG) disclosures and strategies. A further area where governments can play a supportive role is in providing targeted support and participation incentives to smaller companies and players. One way to start is setting up platforms or networks where industry pioneers can share lessons and best practices, possibly in exchange for visibility or reputational benefits.

Governments can also improve markets by creating environments that ensure transparency in areas such as tendering and data disclosures, encourage the sharing of information and discourage unhealthy competition among various market participants and experts.

**Awareness-raising and fostering specialized expertise are further key government tasks.**

Lack of CDM-specific expertise and knowledge were both major obstacles to scaling up projects in the GCC. While awareness of climate change and measures needed to address it has grown significantly among governments and businesses, carbon market-related knowledge still remains a minuscule area of niche expertise across the region. Worldwide, communication about carbon markets remains challenging, but efforts in this area will be paramount should the GCC wish to build successful carbon market participation. Governments need to develop channels and materials to communicate to large and small corporations alike about how different types of carbon markets (such as cap-and-trade mechanisms and baseline-and-crediting mechanisms, on the one hand, and VCMs, on the other) function and how they plan to develop these markets. In addition, governments could actively foster the emergence of a community of local consultants who not only have carbon market expertise but also understand the GCC context. Even while relying on external expertise, a strong market understanding among GCC governments and project owners will be important.

*There are many ways for carbon markets to be successful: success means different things for different stakeholders.*

An interesting finding was that the interviewees’ definitions of what constituted a successful project, or examples of concrete projects that were successful, varied. This indicates that different market actors attach different values and priorities to what carbon markets can or should deliver. One participant defined success (and additionality) as simply completing registration before project implementation starts. Others viewed success as registering, issuing and, most importantly, selling credits. One stakeholder felt that, given the CER price crash, recovering the costs of developing a CDM project—which in many cases did not happen—would have been sufficient for a project to be declared successful. Others emphasized the importance of environmental benefits from projects. One interviewee assigned value to projects that helped start sectoral transformations or “led to the realization that carbon reductions matter,” citing renewable energy and associated gas recovery projects in the region as examples.

**Looking Forward**

The interviewees generally expressed optimism regarding the future potential of carbon markets to support GCC countries in their net-zero transitions by creating business opportunities on the supply side and supporting cost-effective mitigation on the demand side of the market.

One participant pointed out that there has been a dramatic increase in awareness of environmental
Lessons from Gulf Cooperation Council Countries’ Participation

Lessons from Gulf Cooperation Council Countries’ Participation

sustainability and climate change in the region compared to the early days of the CDM, among both governments and corporations. Another expressed optimism that, in this context, building capacity and readiness to engage will be much easier than it was a decade and a half ago. Another pointed out that GCC companies with prior experience with carbon markets are well positioned to re-engage. Even so, the interviewees stressed the need for concrete capacity-building efforts targeting both governments and market participants.

While it will take time—possibly years—for the new Article 6.4 mechanism to be fully operational, one interviewee noted that at least one GCC country is already preparing new projects with an eye to participating under this mechanism. In parallel and in the interim, however, many more saw growth potential in VCMs (i.e., markets that are regulated not by governments domestically, regionally or internationally but rather by private, independent standard-setting organizations and registries). Despite starting from low levels, VCMs have grown rapidly worldwide in recent years, reflecting companies’ increasing focus on ESG frameworks and setting GHG emission targets. In 2021, VCM trade approached 500 million credits and US$2 billion in value (Ecosystem Marketplace 2022).

In the GCC, according to the participants, interest in VCM remained low through the 2010s. However, in recent years, semigovernmental entities in Qatar, Saudi Arabia and the UAE have begun promoting participation in this space through crediting standards and trading platforms. The first to act in this space, the Qatar-based Global Carbon Council, has developed a crediting standard, the Approved Carbon Credit (ACC), which it launched in 2019. The council is aiming to position its credits for both the VCM and Article 6. On the supply side, the appetite for engaging with this standard in the region has started increasing recently, with one project from Oman, one from Qatar and two from the UAE submitted for registration as of October 2022 (GCC 2022). On the buyer side, Qatar’s FIFA World Cup 2022 has committed to a purchase of 1.8 million ACCs to help meet its carbon neutrality pledge via (FIFA n.d.). However, the council’s decision to qualify renewable energy projects from emerging economies still strongly divides opinions.

More recently, Saudi Arabia’s Public Investment Fund and the stock exchange Tadawul launched a VCM platform that targets the Middle East and North Africa region, and the Abu Dhabi Global Market in the UAE is developing a trading exchange and clearinghouse that would regulate VCM credits (SPA 2022; ADGM 2022).

Some interviewees also mentioned a growing interest in renewable energy certificates (RECs), which are a parallel instrument to carbon credits linked specifically to renewable energy projects and the supply of renewable energy to the electricity grid. RECs, as an instrument and market, have matured in recent years, with an increasing number of projects being registered in the UAE, Saudi Arabia, and Oman.

In terms of taking the market forward, one interviewee noted that stable demand for credits “is always good for developers,” suggesting as one option that governments act as purchasers. Another saw the need for regulation for carbon markets to succeed in the GCC in the future. One argued that pre-2020 credits from already existing projects in the region should not be sold so that further mitigation potential could be unlocked and suggested that selling “old credits” would also “not be worth the effort” given the low overall volumes available in the GCC.
Many believed that regional cooperation in carbon markets would be beneficial, or even ultimately necessary, and one suggested that discussions in this space might start to evolve organically once countries start putting in place institutions and “systems” at the domestic level. One stakeholder noted that the post-2020 context is “a world of being both buyers and sellers” and added that GCC countries should now actively explore options and opportunities on both sides, including domestically, within the GCC and in the Middle East and Africa regions more broadly, and explore opportunities for project types ranging from small-scale projects through large-scale removals.
Conclusion

Interest in carbon markets has been rising rapidly in GCC countries, driven both by the reactivation of international market cooperation under the Paris Agreement’s Article 6 and growing interest in VCMs among corporations. To date, the CDM remains the main vehicle through which GCC countries have participated in carbon markets. The mechanism’s institutional legacies, methodological approaches, and practical experiences therefore form a basis for these countries to build on.

The literature on the CDM has largely ignored the GCC countries. While many experiences, such as the CER post-2012 price crash, have been shared globally and apply equally to this region, there are also several unique features that this study identified.

As shown in section 3, GCC countries were not among the most active CDM participants. At the same time, as demonstrated in section 4, the region’s experience with the mechanism provides valuable lessons as it starts engaging with post-2020 carbon markets. By and large, optimism prevailed among the stakeholders interviewed for this study regarding the future potential of carbon markets in the GCC. At the same time, a clear—let alone a shared—view has yet to emerge on how the region’s countries should start engaging with carbon markets domestically, regionally and internationally, both under Article 6 and in VCMs.

What appears clear based on the experiences documented by this study is that early engagement will be key for the region to position itself favorably in the post-2020 era. Most importantly, the study confirms that government leadership will be crucial in paving the way for businesses to engage successfully and meaningfully. The first necessary steps include setting up the necessary regulatory systems and market frameworks, building capacity across the board, fostering local market ecosystems, and initiating pilot projects.
Endnotes

1 The first CDM project was registered in 2004 (UNFCCC 2022a), but the mechanism formally became operational in 2006 (UNFCCC 2022b).

2 According to Decision 2/CMP.16 (UNFCCC 2021), “registration, renewal of crediting period and issuance of certified emission reductions for project activities, as well as the equivalent submissions for programmes of activities, relating to emission reductions occurring after 31 December 2020 may not be submitted under the clean development mechanism.”

3 PoAs, which targeted activities aligned toward the same policy, measure or target, allowed an unlimited number of projects to be added as “component project activities” with the aim of lowering transaction costs for smaller projects in particular.

4 Japan accounted for 13%, and the remainder was either accounted for by other Annex I countries or not yet transferred from the CDM registry. The UK and Switzerland acted as the main trading hubs, accounting for nearly half of the total primary CER demand as of the beginning of 2012 (Shislov and Bellassen 2012).

5 From 2013 onward, the EU-ETS ban extended to CERs from projects registered after 2012 in all other countries except least developed countries (LDCs) or those with intergovernmental agreements with other host countries in place (Shislov and Bellassen 2012.)

6 Lütken (2008, 89) explains the lack of investments from Annex I countries with the threat-based investment motivation for these investors, which leads to “1) the response to the emissions constraint [being] linked to markets already addressed by the constrained entity and 2) the possible investment [being] restricted to technologies with which the investor is familiar.”

7 Unless specifically mentioned, data from this section are from the UNEP CDM and PoA pipelines (Fenhann 2022a, 2022b).

8 The PoA modality enabled the registration of a “coordinated implementation of a policy, measure or goal that leads to emission reduction” (UNFCCC 2022d). It allowed for component project activities (CPAs) to be added under PoAs without having to go through the full CDM project cycle.

9 1,014.52 MtCO\(_2\)e/year for projects and 123.55 MtCO\(_2\)e/year for PoAs. Crediting periods are most commonly seven or 10 years for CDM projects and 28 years for PoAs.

10 China’s GHG emissions in 2012 were estimated as 10,675.66 MtCO\(_2\)e, India’s as 2,740.40 MtCO\(_2\), and Brazil’s as 1,319.48 MtCO\(_2\). The total potential average annual first crediting cycle reductions from registered projects and PoAs in these countries were as follows: China, 599.20 MtCO\(_2\)e/year (596,494 ktCO\(_2\)e for projects and 2,709 ktCO\(_2\)e for PoAs); India, 158.32 MtCO\(_2\)e/year (119,671 ktCO\(_2\)e for projects and 38,645 ktCO\(_2\)e for PoAs); and Brazil, 57.44 MtCO\(_2\)e/year (49,215 ktCO\(_2\)e for projects and 8,228 ktCO\(_2\)e for PoAs).

11 Compared to the UNEP pipeline, which the authors have used extensively in this paper because it provides aggregated data, the CDM registry includes one additional PoA, as is also indicated in the note under Table 1.

12 In addition to the GCC OPEC members, the OPEC member countries other than Iran and Nigeria hosting registered CDM projects are Algeria (two projects), Angola (one project), and Libya (two projects). The total first crediting period reduction potential of all registered CDM projects in Iran (13) and Nigeria (11) is 9.086 MtCO\(_2\)e/year. The 13 oil and gas sector-related projects’ reduction potential was 6.581 MtCO\(_2\)e/year.

13 One stakeholder further suggested that due to opposition by some countries to the inclusion of CCS among accepted CDM project activities, the agreed-upon UNFCCC guidance was extremely specific for issues such as safeguards, liability transfers, and measurement, reporting and verification requirements.
There are some discrepancies in this area between the data provided by the UNEP pipeline (Fenhann 2022a, 2022b) and the data provided by the UNFCCC CDM registry (UNFCCC 2022c). The latter has the most accurate, up-to-date information.

The example of Brazil is a case in point: the country developed the original proposals for the CDM under the UNFCCC umbrella, set up the relevant institutions early, hosted the first registered CDM project, and ultimately captured one of the largest shares of CDM projects in the world (Witkowski Frangetto, Veiga, and Luedemann 2019).

The list excludes experts who did not wish to have their names disclosed.
References


References


———. 2011. “Modalities and procedures for carbon dioxide capture and storage in geological formations as clean development mechanism project activities.


References


### Table A.1. Voluntary cancellations of CERs from GCC-based CDM projects by GCC-based entities.

<table>
<thead>
<tr>
<th>Country</th>
<th>Project Name</th>
<th>Developer</th>
<th>Unilateral</th>
<th>Issued CERS</th>
<th>Voluntary cancellation</th>
<th>Volume</th>
<th>Years</th>
<th>No of cancellations</th>
<th>Purpose</th>
</tr>
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<td>-</td>
<td>-</td>
<td>N/A</td>
<td>-</td>
<td>Yes</td>
<td>-</td>
<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>Kuwait</td>
<td>Flare gas recovery unit 105 project in MAA refinery, KNPC</td>
<td>-</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Kuwait</td>
<td>Flare Gas Recovery Facilities Project in Unit 49 of MAB Refinery, KNPC</td>
<td>-</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td>-</td>
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<td>-</td>
</tr>
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<td>Oman</td>
<td>Associated Gas Recovery and Utilization at Block 9</td>
<td>Caspervandtak Consulting</td>
<td>No</td>
<td>Yes</td>
<td></td>
<td>200,000</td>
<td>2020-2021</td>
<td>12</td>
<td>UER under FQD</td>
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<td>Oman</td>
<td>Waste Management Project at Al Amerat</td>
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<td>Yes</td>
<td>No</td>
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<td>-</td>
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<td>Oman</td>
<td>Associated Gas Recovery and Utilization at Khamilah Oil Field Area at Block-27 in Wilayat Ibi of the Sultanate of Oman</td>
<td>-</td>
<td>No</td>
<td>Yes</td>
<td></td>
<td>239</td>
<td>2021</td>
<td>2</td>
<td>UER under FQD</td>
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<td>Qatar</td>
<td>Al-Shaheen Oil Field Gas Recovery and Utilization Project</td>
<td>EcoSecurities</td>
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<td>Yes</td>
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<td>-</td>
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<tr>
<td>Qatar</td>
<td></td>
<td>Medium-Pressure Steam Condensate Water Recovery</td>
<td>N/A</td>
<td>Yes</td>
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<td>-</td>
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<td>Madinah Landfill Gas Capture Project</td>
<td>-</td>
<td>No</td>
<td>No</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>Saudi Arabia</td>
<td>Jeddah Old Landfill (JOLF) and Jeddah New Landfill (JNLF) Landfill Gas Recovery Bundled Project</td>
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<td>No</td>
<td>No</td>
<td></td>
<td>-</td>
<td>-</td>
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<tr>
<td>Saudi Arabia</td>
<td>Solar Power Project at North Park Building</td>
<td>EY</td>
<td>Yes</td>
<td>No</td>
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<td>-</td>
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<td>Saudi Arabia</td>
<td>Installation of a tri-generation system supplying energy to a commercial building</td>
<td>-</td>
<td>No</td>
<td>No</td>
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<td>Saudi Arabia</td>
<td>Efficiency Improvement by Boiler Rehabilitation in Fossil Fuel-fired (Natural Gas) Steam Boiler System</td>
<td>-</td>
<td>Yes</td>
<td>Yes</td>
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<td>92,000</td>
<td>2019-2021</td>
<td>2</td>
<td>Carbon-neutral operations</td>
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<td>Saudi Arabia</td>
<td>Boiler Second Economizer in Yansab, Kingdom of Saudi Arabia</td>
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<td>Yes</td>
<td>Yes</td>
<td></td>
<td>-</td>
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<tr>
<td>Country</td>
<td>Programme of Activities</td>
<td>Implementor</td>
<td>Taking Place?</td>
<td>Efforts?</td>
<td>Source</td>
<td></td>
<td></td>
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<td>Saudi Arabia</td>
<td>Advanced Energy Solutions for Buildings Programme of Activities</td>
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<td>Saudi Arabia</td>
<td>Renewable Energy Programme of Activities in Middle East and North Africa</td>
<td>-</td>
<td>No</td>
<td>No</td>
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<tr>
<td>UAE</td>
<td>ADFEC 10 MW Solar Power Plant</td>
<td>Masdar</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
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<tr>
<td>UAE</td>
<td>Biogas Technology Group Ras Al-Khaimah Landfill Gas to Energy Project</td>
<td>EcoSecurities</td>
<td>No</td>
<td>Yes</td>
<td></td>
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<tr>
<td>UAE</td>
<td>Abu Dhabi solar thermal power project, Masdar</td>
<td>Masdar</td>
<td>Yes</td>
<td>No</td>
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<tr>
<td>UAE</td>
<td>Low-pressure steam generation by recovering waste heat using heat reclaimers at Emirates CMS Power</td>
<td>Masdar</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>UAE</td>
<td>Implementing energy-efficiency measures to reduce fuel gas consumption at GASCO</td>
<td>Masdar</td>
<td>Yes</td>
<td>Yes</td>
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<td>UAE</td>
<td>Dubai CFL Project</td>
<td>Dubai Carbon Centre of Excellence (DCCE)</td>
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<td>No</td>
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<td>UAE</td>
<td>10 MW Photovoltaic Plant in Dubai, UAE</td>
<td>DCCE</td>
<td>Yes</td>
<td>Yes</td>
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<td>UAE</td>
<td>Regenerative Burners for Melting Furnaces</td>
<td>DCCE</td>
<td>Yes</td>
<td>No</td>
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<td>UAE</td>
<td>UCC RAK Waste Heat Recovery</td>
<td>DCCE</td>
<td>Yes</td>
<td>No</td>
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<td>UAE</td>
<td>DEWA Chiller Station L</td>
<td>DCCE</td>
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<td>UAE</td>
<td>LFG flaring project at Dubai, UAE</td>
<td>GESS</td>
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<td>UAE</td>
<td>Sir Bani Yas Wind Farm Project</td>
<td>Masdar</td>
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<tr>
<td>UAE</td>
<td>Flare gas reduction through spiking compressor at Shah</td>
<td>Masdar</td>
<td>Yes</td>
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<td>UAE</td>
<td>Dubai 200 MW Photovoltaic Plant</td>
<td>DCCE</td>
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<td>UAE</td>
<td>UAE Small Scale Solar Program of Activities</td>
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Source: UNFCCC (2022c).
### Table A.2. Breakdown of CDM projects registered globally and GCC by type (1st crediting period).

<table>
<thead>
<tr>
<th>Category</th>
<th>Type of project</th>
<th>1st period kCO₂e/year</th>
<th>Number of projects</th>
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<tr>
<td></td>
<td></td>
<td>World</td>
<td>GCC</td>
</tr>
<tr>
<td>Afforestation and reforestation</td>
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<td>276.1</td>
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<td></td>
<td>Reforestation</td>
<td>1,671.4</td>
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<td>Methane and chemicals</td>
<td>Agriculture</td>
<td>8.4</td>
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<td></td>
<td>Cement</td>
<td>3,858.4</td>
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<tr>
<td></td>
<td>CO₂ usage</td>
<td>91.1</td>
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<td></td>
<td>Coalbed/mine methane</td>
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<td></td>
<td>Fugitive</td>
<td>31,390.4</td>
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<td></td>
<td>Landfill gas</td>
<td>54,884.9</td>
<td>802.9</td>
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<td></td>
<td>Methane avoidance</td>
<td>25,962.3</td>
<td>17.5</td>
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<td>Energy efficiency (EE)</td>
<td>EE households</td>
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<td>EE industry</td>
<td>3,556.2</td>
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<td>EE own generation</td>
<td>45,281.7</td>
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<td>EE service</td>
<td>488.6</td>
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<td>EE supply side</td>
<td>27,218.8</td>
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<td>Energy distribution</td>
<td>5,633.8</td>
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<td>Fuel switching</td>
<td>Fossil fuel switch</td>
<td>56,075.1</td>
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<td>Hydrofluorocarbons and other industrial gases</td>
<td>HFCs</td>
<td>81,318.7</td>
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</tr>
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<td></td>
<td>N₂O</td>
<td>57,153.9</td>
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<td>PFCs and SF6</td>
<td>2,820.0</td>
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<td>Renewable energy</td>
<td>Biomass energy</td>
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<td>Geothermal</td>
<td>11,606.3</td>
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<td></td>
<td>Hydro</td>
<td>272,817.7</td>
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<td></td>
<td>Mixed renewables</td>
<td>491.8</td>
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<td></td>
<td>Solar</td>
<td>15,065.9</td>
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<td></td>
<td>Tidal</td>
<td>315.4</td>
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<td></td>
<td>Wind</td>
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<td>Transport</td>
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<td>3,649.7</td>
<td>-</td>
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</table>

Source: Fenhann (2022a).

### List of Experts Interviewed¹⁶

Experts interviewed for this study, whom we wish to thank for their valuable contributions, included Nikunj Agarwal, Dennis Alexandersen, Shivaji Chakraborty, Reshma Francy, Ivano Iannelli, Zaour Israfilof, Tobias Koch, Axel Michaelowa, Anita Nouri, Clemens Plöchl, Shashi Prakash, Beatrix Schmuelling, Kishor Rajhansa, and David Ungar.
About the Authors

Mari Luomi

Mari is a Fellow II in KAPSARC’s Climate and Sustainability program. A policy-oriented social scientist, she has been studying climate change, energy transitions and sustainable development policy in the Gulf and globally for 15 years. At KAPSARC, she leads the Carbon Markets and Paris Agreement Article 6 and the Circular Carbon Economy Index projects. She has previously worked for other leading energy, sustainable development and foreign policy research institutions, including the Oxford Institute for Energy Studies, the International Institute for Sustainable Development (Earth Negotiations Bulletin), Georgetown University, the Finnish Institute of International Affairs, and the Emirates Diplomatic Academy.

Mari holds a master’s degree in political science and international politics from the University of Helsinki and a Ph.D. in Middle Eastern studies from Durham University. In addition to a broad research publications portfolio, she has substantial experience in executive training, presentations, policy advisory, and reporting services for multilateral environmental negotiations.

Thomas Bosse

Thomas has over 15 years of international experience as a director, program manager, and team leader in areas such as energy, sustainability, green economy, and climate change. His primary focus areas include carbon management, environmental commodities markets, climate mitigation projects, and sustainability and green economy strategies and frameworks.

Some of his most significant work includes managing emission reduction projects and programs throughout the entire project life cycle; authoring UNFCCC-backed CDM large-scale baseline and monitoring methodologies; conducting capacity-building workshops for government institutions, investors, funds, and energy trading companies; developing carbon footprints, GHG inventories, and MRV frameworks at the product, project, organization, city, and country levels in line with international standards; developing and implementing carbon abatement strategies at the organization and city levels; drafting GHG regulations and policies at the city level; developing offset portfolio management strategies and fund concepts for organizations; transacting offsets and environmental attributes; and developing a market for RECs across the GCC region.

Currently, Thomas heads the Carbon Unit at the NEOM Energy and Water Company.

Disclaimer: The views expressed in this publication are those of the author and do not necessarily reflect the opinions or views of NEOM.
Zlata Sergeeva

Zlata leads the Future of Hydrocarbons in a Carbon-Managed World project, which aims to estimate the consequences of international carbon regulation for hydrocarbon markets, with producers starting to offer carbon-neutral LNG and carbon-neutral oil cargos.

Previously, Zlata worked in the Energy Center of the Skolkovo Business School, where she researched natural gas and LNG markets and organized the international Energy Summer School for several hundred participants from all over the world.

Later, she joined the Business Strategy Department in NOVATEK, Russia’s leading independent gas producer, where her main focus was on strategic forecasting and international cooperation in LNG, hydrogen and CCUS.

Since 2020, Zlata has also been a member of the Future Energy Leaders Programme of the World Energy Council.
About the Project

KAPSARC’s Carbon Markets and Paris Agreement Article 6 project aims to support Saudi Arabia’s participation in and engagement with domestic and international carbon markets. It seeks to contribute to increasing awareness and strengthening understanding of carbon markets in Saudi Arabia and the broader Gulf Cooperation Council (GCC) region through empirical, evidence-based, policy-oriented research and analysis.

Carbon markets can support both private sector and government efforts to reduce—avoid or remove—greenhouse gas (GHG) emissions and contribute to reaching the goals of the Paris Agreement in an effective way while providing various benefits to multiple stakeholders. Among other things, well-functioning carbon markets can lower the costs of GHG emission reductions, support the transfer of clean technologies and finance, and unlock higher mitigation ambition over time.

The project focuses on questions including the following:

What lessons can be learned from Saudi Arabia’s and the Gulf region’s past experience with carbon markets that are helpful for the post-2020 era?

How is the international carbon market landscape shaping up, including in relation to voluntary carbon markets (VCMs) and other mechanisms linking to Article 6, and what are the related challenges and opportunities?

What can Saudi Arabia do to reap the most benefits from VCM approaches and instruments? Which design options best suit Saudi Arabia’s priorities and goals?