



Qamar Energy Credentials

June 2024

STRICTLY CONFIDENTIAL

Qamar Energy at a Glance

WHOWEARE

We are a Dubai-based independent energy consultancy covering the energy and utilities sector across the Middle East and North Africa

We are experts in the oil and gas, power and utilities, renewables, carbon capture / storage, and hydrogen sectors

Our clients include regional and international governments, national energy companies, global energy majors, and international development and financial institutions

We offer tailor-made energy market design, technocommercial analysis, economic feasibility, project bankability, strategic planning, market entry, M&A strategy, legal advisory and commercial regulatory

SECTORAL COVERAGE



O&G: Economics, strategy and transactions



Power & Utilities:Policy, economics,
quantitative analysis

Transition Tech: CCUS, batteries, renewables & hydrogen

OUR APPROACH

Data

Fit for purpose solutions, data analysis, dashboards, and proprietary services

Analytics

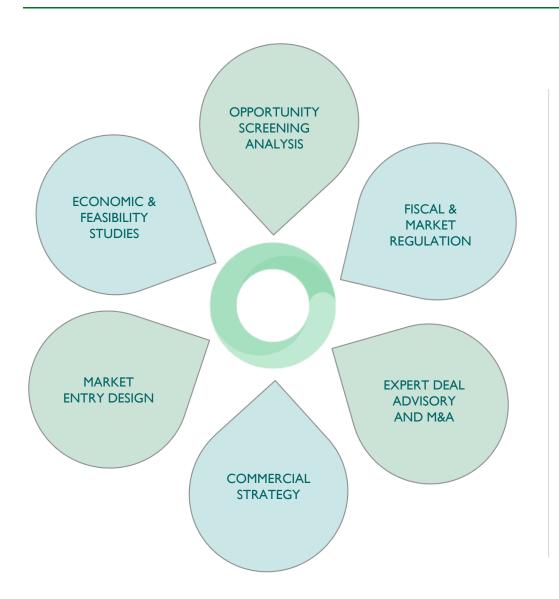
An A-Z library of the energy sector comprising reports, daily commentaries, market intelligence, and factsheets

Consulting

Tailored consulting on market design, energy transition, economic feasibility, strategic planning, and market entry







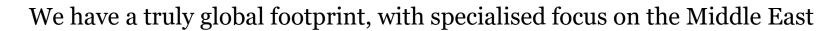
WHY US?

Deep familiarity with global energy markets, including the MENA, Eurasia, West Asia, and Central Asia markets; oil, gas, and gas monetisation opportunity development; CCS and market design for CCS, hydrogen, and clean energy

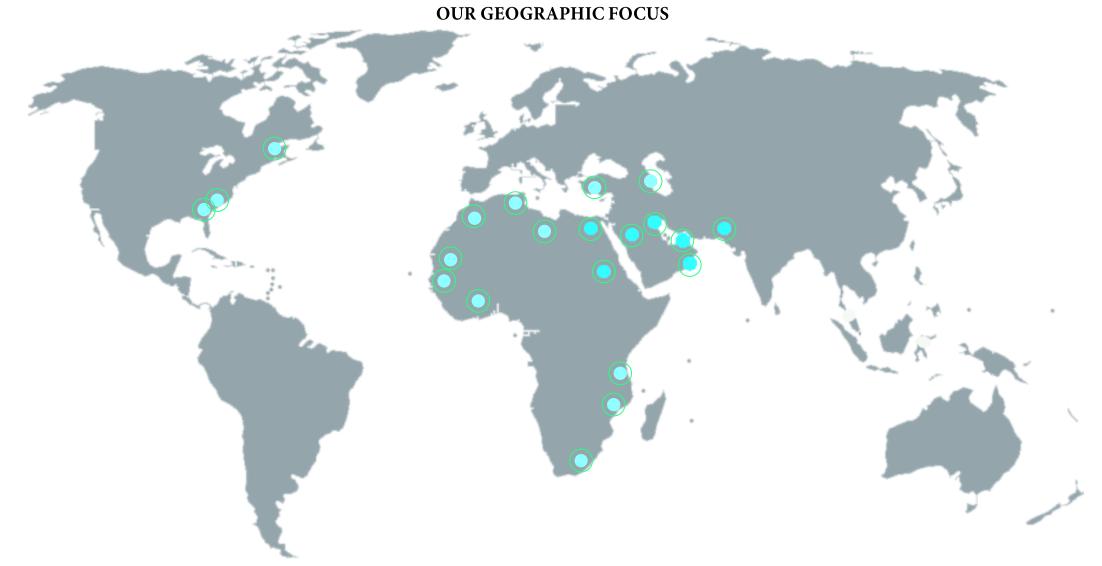
50+ years of specialised experience in the O&G, alternative and new energy sector, including experience in implementation of projects and advice on gas, LNG, power, CCS, hydrogen, and other new energy technologies

Unique combination of economic, market, commercial and geopolitical insight into issues affecting investment, and strong local partners and associates; knowledge of regional languages including Arabic

Extensive analysis and statistical database of the region, as well as an extensive network of contacts: both in the governmental and private sectors









We have a truly global footprint, with specialised focus on the Middle East

SELECTED EXPERIENCE

| Region | Description of work |
|---------------|--|
| Middle East | Detailed studies on gas and gas-to-power sector, forecasting flared and captured gas, demand/supply dynamics till 2040 in Iraq Advising the US Department of Energy on the Kurdistan region gas sector Comprehensive analysis of major renewable and solar support mechanisms in Jordan / Lebanon Detailed studies on gas and gas-to-power sector, oil, renewables, petrochemicals, forecasting demand/supply dynamics for Iran |
| GCC | Landmark report on the prospects for carbon capture and storage in MENA Report on the global and Gulf governance of CCUS Comprehensive report on possible pathways to move from a fossil fuel to a hydrogen-based economy in the GCC Co-authors of the International Renewable Energy Agency (IRENA) GCC 2019 and 2023 reports Advised at the most senior levels on renewable energy and energy efficiency policy, strategy, and governance Detailed quarterly updates on oil products movement, volume, storage at Fujairah Oil Terminal |
| North Africa | • Created detailed forecast for East Mediterranean gas & LNG supply and demand for large international gas company |
| Turkey | • Electricity capacity, supply and demand forecasts by power plant and fuel type, price analysis for Turkey |
| Eurasia | Comprehensive study of oil assets in Azerbaijan (Buzovna-Mashtaga / Gala / Zirreh) |
| Central Asia | Comprehensive study of Turkmenistan Caspian oil fields and gas monetisation |
| Africa | Contract negotiations for Upstream LNG GTA project in Mauritania – Senegal Domestic gas market development in Mozambique Gas-to-Power consulting projects in Benin, Ghana, Mozambique, Tanzania, Nigeria, Seychelles, South Africa, Ecuador, and El Salvador |
| South Asia | Regional natural gas and petrochemical industry analysis, capacity and production outlook / trends, potential for carbon mitigation, including carbon capture FSRU Project in West India for supplying 2.5 MTPA to industrial end users In-depth multi-client study evaluating strategic developments in Pakistan and India's gas and LNG sectors |
| North America | Advisory on structuring and origination of downstream offtakers for 5 upstream LNG projects in the US and Canada |



Our selected partners and clients



Abu Dhabi National Oil Company (ADNOC), United Arab Emirates



Emirates National Oil Company (ENOC), United Arab Emirates



Sharjah National Oil Company (SNOC), United Arab Emirates



Ras Al Khaimah Gas Company (RAK GAS), United Arab Emirates



Fujairah Oil Terminal Company, United Arab Emirates



Kuwait Foreign Petroleum and Exploration (KUFPEC), Kuwait



Oman Tank Terminal Company (OTTC), Oman



Royal Dutch Shell, Netherlands



Gazprom Neft, Russia



Mitsubishi Corporation, Japan



TotalEnergies, France



Department of Energy, United States



Emirates Water and Electricity Authority, United Arab Emirates



Mubadala Development Company, United Arab Emirates



Australian Trade Commission, Australia



AD Developmental Holding (ADQ), United Arab Emirates



CGG, France



South Korean Engineering & Construction Company (SKEC)



Columbia Center on Global Energy Policy, United States



IRENA, United Arab Emirates



Netherlands Embassy, UAE



Global CCS Institute, Australia



MASDAR Clean Energy, United Arab Emirates



Engie, France/UAE



Bank of America, US / UAE

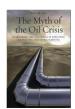


Our Team: Robin Mills, CEO



Robin is an expert on Middle East energy strategy, described by Foreign Policy as "one of the energy world's great minds". He is the author of two books, The Myth of the Oil Crisis and Capturing Carbon, the first comprehensive overview of CCS for the general reader, columnist on energy and environmental issues for Bloomberg and The National, and comments widely on energy issues in the media, including the Financial Times, Foreign Policy, Atlantic, CNN, BBC, Sky News and others. He worked for a decade for Shell, advancing business development efforts in the Middle East and CCS in Norway, then for Dubai Holding and the Emirates National Oil Company. He founded Qamar Energy to deliver unique regionally-based Middle East energy insight and business opportunities for the international oil and gas industry.

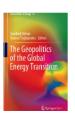
He was awarded the Global Energy Prize in St. Petersburg, Russia, 2016. He is a Fellow at the Columbia University Center on Global Energy Policy, Non-Resident Fellow with the Arab Gulf States Institute in Washington, and Senior Fellow with the Iraq Energy Institute and former Non-Resident Fellow at the Brookings Institution. He holds a first-class degree in Geology from the University of Cambridge and speaks five languages including Arabic.



OF THE OIL CRISIS



CAPTURING CARBON:



A FINE BALANCE: GEOPOLITICS OF THE ENERGY



LOW CARBON ENERGY IN THE MIDDLE EAST



HYDROGEN IN THE UAE Oxford Institute for



HAVING IT BOTH WAYS: GCC OIL FACES PEAK DEMAND

Policy



THE FUTURE OF DEMAND

UNDER A CLOUD MIDDLE EAST GAS Center on Global Energ@enter on Global Energy Policy

APPETITE & INNOVATION: NATURAL GAS IN THE UAE Oxford Institute of Energy Studies



SUNRISE IN THE DESERT: SOLAR BECOMES COMMERCIALLY VIABLE IN MENA PWC/Emirates Solar Industry Association



RISKY ROUTES: ENERGY TRANSIT IN THE MIDDLE EAST Brookings Institution



A ROCKY ROAD: KURDISH OIL AND INDEPENDENCE Iraq Energy Institute



UNDER THE MOUNTAINS: KURDISH OIL & REGIONAL POLITICS Oxford Institute for Energy Studies

- I. Regional oil and gas outlook for a major IOC
- Central Asia O&G business development strategy
- Central Asia gas export outlook for a large European utility
- 4. E&P and business development strategy on Azerbaijan O&G assets for confidential client
- 5. MENA CCUS and hydrogen sector forecast, for a leading global energy company
- 6. Turkish and Iraqi Kurdistan gas and gas-power study for major IOC
- 7. Energy and gas market restructuring for a consortium of state energy companies in a MENA country
- 8. Hydrogen strategy and policy for a GCC state-owned NOC



Our Team: Dina Guirguis, Legal Advisor



Dina is a U.S. qualified Egyptian American attorney experienced in legal and policy roles and has assumed numerous regional positions as inhouse counsel for multinationals, managing all corporate legal areas from contracts to compliance. She has practiced dispute resolution in energy practices with a major U.S. law firm in Dubai, and compliance and regulatory law at a leading global firm in Washington, D.C. She has assumed numerous policy roles in Washington, D.C., including as advocacy director for the Tahrir Institute for Middle East Policy (TIMEP), and as fellow at The Washington Institute for Near East Policy (WINEP). Dina also provides legal services to international companies in the Middle East, with a focus on acquisitions, joint venture, commercial and corporate agreements, and legal due diligence. She has authored numerous policy pieces on political and legal reform in the Middle East and is certified in International Legislative Drafting by the International Law Institute. She is professionally fluent in English, Arabic and French.

| Functional Expertise | Industry Expertise |
|--|--|
| Petroleum legal issues Contracts Arbitration and dispute resolution Advocacy Legal due diligence | Oil and gas upstreamGas and LNGNew EnergiesConstruction |

- I. Engaged with MENA ministries for oil and energy for company qualification and registration
- 2. Managed an arbitration case between an Iraqi contractor and a services provider at the Dubai International Arbitration Centre
- 3. Carried out legal due diligence and contract evaluation in bid qualification process for a major IOC
- 4. Supervised contract drafting and preparation for a MENA construction and logistics firm
- 5. Carried out extensive due diligence on a GCC conglomerate in Bahrain and Qatar
- 6. Advised on major EPC infrastructure project in Saudi Arabia



Our Team: Maryam Salman, Consultant



Maryam is Qamar Energy's lead Consultant for Middle East energy markets. She leads Qamar's commercial and economic consulting portfolio in the oil and gas, renewables, and new energies sectors, and is a professional in strategy development and regulatory design for the sustainability and energy transformation segments. She is the co-author of Powering Iraq: Challenges Facing the Electricity Sector in Iraq for the Al Bayan Center for Planning & Studies, Renewable Energy Market Analysis: GCC 2019 and 2023 for IRENA, and was a supporting author for the flagship report, The UAE's Role in the Global Hydrogen Economy, prepared on behalf of ADNOC, Mubadala, ADQ, and the UAE Ministry of Energy & Infrastructure. Maryam writes for international media outlets and has been a speaker for the Energy Industries Council, the Derasat Foundation, EnergyRisk, Enuit, and others. She is Gold Medallist in Media and Communications from the University of Delhi, and the recipient of the DIAC Academic Excellence Award in recognition of graduating summa cum laude as a Master of International Studies from the University of Wollongong in Dubai, with specialisation in Middle East energy security and foreign policy. She knows 5 languages, including Arabic and French.

| Functional Expertise | Industry Expertise |
|---|---|
| New energy markets analysis Commercial consulting Business models Investor relations | Oil and gas upstream Gas and LNG New Energies & Renewables CCUS & Hydrogen |

- I. Led the energy portfolio of an IOC's business development strategy in Iraqi Kurdistan's oil, gas, and power sectors
- 2. Study on the provision of gas injection/CO₂ to EOR to IOCs in MENA
- Comprehensive analysis of the MENA renewables market and demand/supply dynamics
- 4. MENA CCUS and hydrogen sector forecast, for a leading global energy company
- 5. Turkish and Iraqi Kurdistan gas and gas-power study for major IOC
- 6. Led detailed report on Bahrain's E&P potential for shale and tight gas, including forecast on fiscal terms and cashflow till 2050



Our Team: Ahmed Zaheer, Consultant



Ahmed is Qamar Energy's consultant and holds over 10 years of experience. He specialises on delivering strategy consulting engagements relating to energy market design, market entry, business growth, and energy transition. Prior to joining Qamar Energy, he was an Energy, Strategy Consultant at AWR Lloyd based in Hong Kong, and executed 16 strategy consulting engagements, advising Southeast Asian and East Asian private and state-owned corporations operating in the energy, mining, utilities, and renewables sector. Ahmed began his career in Investment Banking and Capital Markets Advisory at Morgan Stanley in the United Kingdom. He was an Analyst on the Investment Banking team at Arqaam Capital in Dubai, and a Senior Analyst on the Capital Markets Advisory practice at Astramina Capital in Malaysia. Ahmed holds a Bachelors degree in Economics from the London Metropolitan University, United Kingdom, and a Postgraduate degree in Economics from the University of St. Andrews in Scotland. He speaks three languages, including Urdu and basic-level Russian.

| Functional Expertise | Industry Expertise |
|---|--|
| Market Entry Strategy Business Growth Strategy Regulatory and Energy Market Design Mergers and Acquisitions Project Finance Financial Modelling and Valuations | Oil and Gas Power & Utilities Metals & Mining Renewables New Energies Technologies |

- I. Developed a comprehensive financial assessment of Iraq's natural gas market design with recommendations to attract FID and encourage the development of natural gas resources.
- 2. Conducted a pre-feasibility study in relation to developing a 5 Mbbl crude oil and petroleum products storage infrastructure in Oman.
- 3. Assessed the demand-supply balance for crude oil and petroleum products storage in the MENA region and provided a competitive analysis of other large storage facilities.
- 4. Delivered a market analysis of the South Asian natural gas sector, including a review of the legislative and regulatory framework, and the LNG value chain.



We are in partnership with some of the world's leading experts on the energy transformation

OUR PARTNERS

CGG

CGG is a multinational geoscience technology services offering bespoke CCUS and Hydrogen solutions to identify and derisk storage sites and optimise their development for safe and effective injection and storage of CO₂ and H₂.

KENT

Kent is a world-class provider of engineering services, offering services from consulting, engineering, and commissioning, through to operations and maintenance, for the energy and industrial sectors, including for CCUS and hydrogen.

CGEP

The Columbia Center on Global Energy Policy (CGEP) is one of the world's foremost energy research institutions. Its mission is to enable public and private sector leaders to make more informed choices about the world's most pressing energy issues.

Our CEO Robin Mills is a fellow at CGEP.

ARABIA MONITOR

Arabia Monitor is an independent research firm specialised in economic and market analysis, and strategy advice in MENA. Arabia Monitor's in-depth, locally informed analysis by Arab, Persian and Chinese speakers has placed it consistently ahead of the curve in identifying new trends within and around the region and understanding its geopolitics.

EIKON REFINITIV

Eikon Refinitiv is a global provider financial markets and commodities' data.

Qamar Energy is a leading provider of the latest energy and geopolitical data across the energy spectrum on the Eikon Refinitiv database.









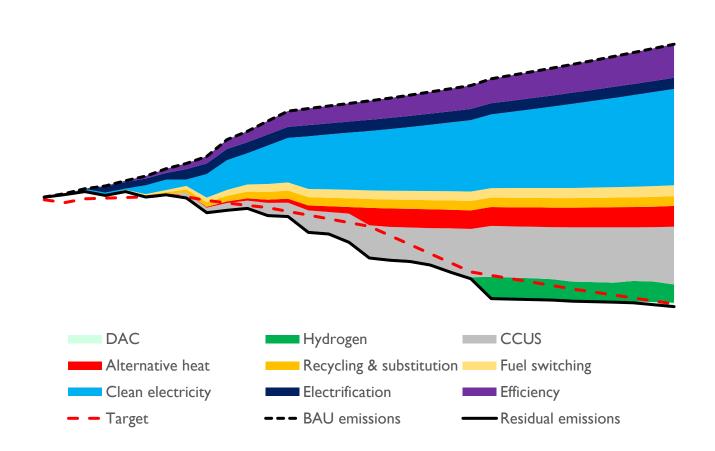
REFINITIV 🗲



Case Studies: UAE Industrial Decarbonisation Roadmap – Comprehensive Study on the Technology Levers Required to Achieve National Net Zero Ambitions

UAE Industrial Decarbonisation Pathway

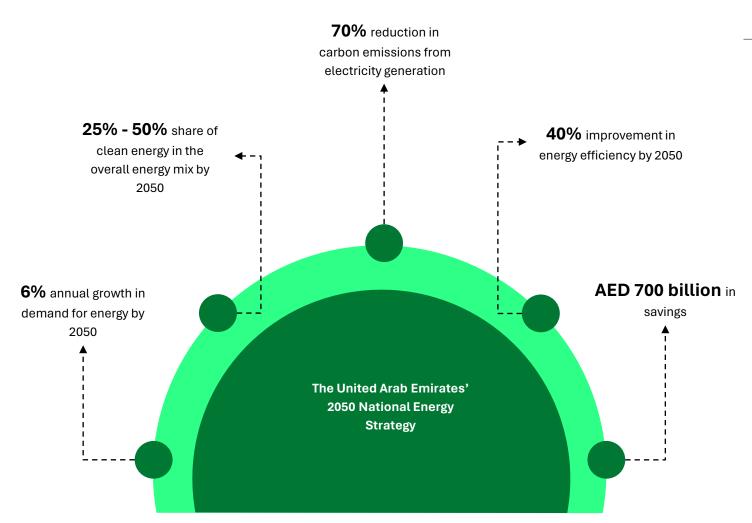
Units: MtCO₂



- Year of Study: 2023
- Client: Ministry of Industry and Advanced Technology
- Analyse UAE emissions profile by industrial cluster and activity
- Map energy use and emissions chain for key emitters, industrial processes, operations
- Quantify the emissions mitigation impact of decarbonisation technologies and their relevance and applicability to the UAE
- Develop scenarios-based model of CO₂ and GHG emissions to 2050 and identify pathways for reductions
- Draw key conclusions for government decision-making



Case Studies: Initial Scoping Study on UAE's 2050 Energy Strategy for the Ministry of Energy and Infrastructure, UAE

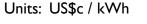


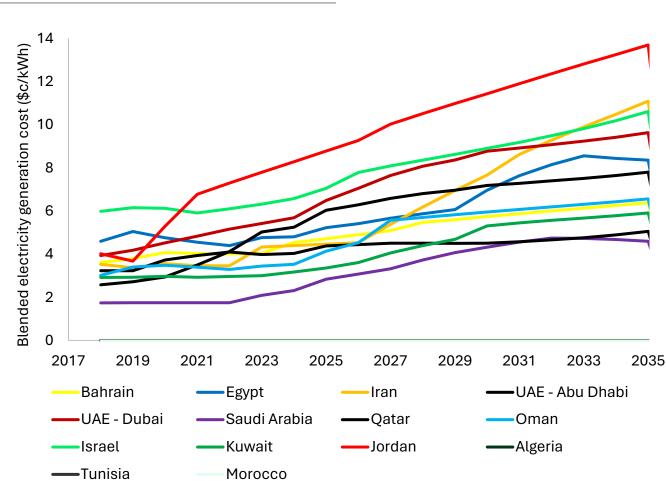
- Year of Study: 2023
- <u>Client</u>: Ministry of Energy and Infrastructure, UAE
- Identified favourable and required set of enablers to support and facilitate the energy transition, in line with the UAE's net zero ambitions
- Developed a strategic framework for implementing the 2050 energy strategy
- Mapped the entities within the regulatory structure responsible for overseeing the implementation of the strategy



Case Studies: Energy and Industrial market assessment for an Anglo-Australian metals & mining company's business evaluation and market entry strategy

Blended Electricity Generation Costs





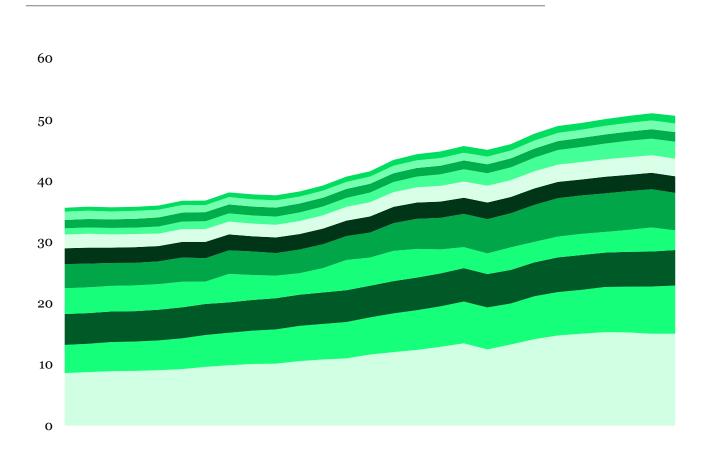
- Year of Study: 2023
- <u>Client</u>: Anglo-Australian metals & mining company
- Assessed the competitive energy landscape across the MENA region, and the prospects for the development of energy-intensive industries (steel and aluminium)
- Mapped the MENA gas value chain, pricing mechanisms, supply-demand balance, and export costs
- Developed a cost models for MENA green and blue hydrogen production and CCUS
- Evaluated MENA resource policies and their impact on gas and electricity pricing to heavy industries
- Advised the company on implications for industrial relocation to the MENA region



Case Studies: report on carbon footprints of energy companies, potential mitigation strategies, carbon pricing and tariffs, challenges with lending & export bans

CO₂ Emissions by Sector

Unit: Billion tCO₂e



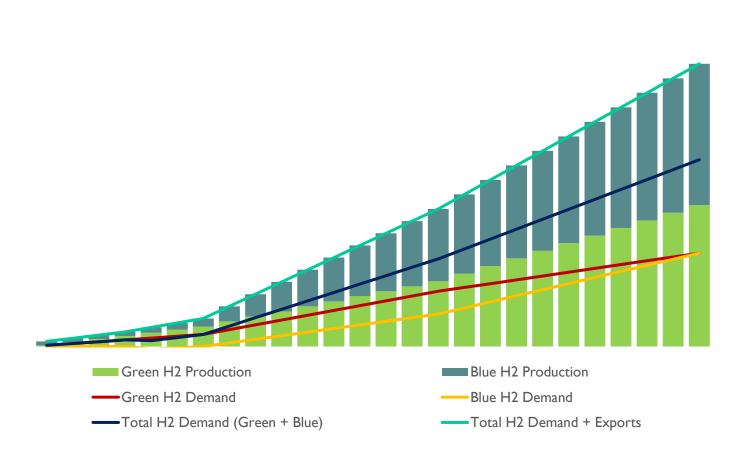
- Year of Study: 2019
- Client: Confidential
- An overview of the global carbon factor of oil and gas companies and their existing mitigation strategies
- In-depth interviews with a wide range of stakeholders from MENA and European industry, government, research and environmental experts
- Specialised assessment of future strategies like carbon pricing/taxation, and lending/export bans
- Insights and recommendations for business development



Case Studies: Comprehensive and detailed assessment of the UAE Hydrogen Market, key stakeholders and policies to identify partnership with European companies

Projected UAE Hydrogen Production

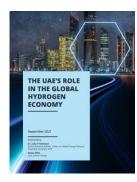
Units: Mt/y



- Year of Study: 2023
- Client: European Government (Confidential)
- Developed a detailed analysis of the UAE's hydrogen energy market, mapped key stakeholders and initiatives pertaining to hydrogen uptake
- Developed a comprehensive assessment of existing federal and state-level policies, market, and regulatory frameworks
- Identified conducive partnership opportunities between European hydrogen companies and local GCC hydrogen energy companies



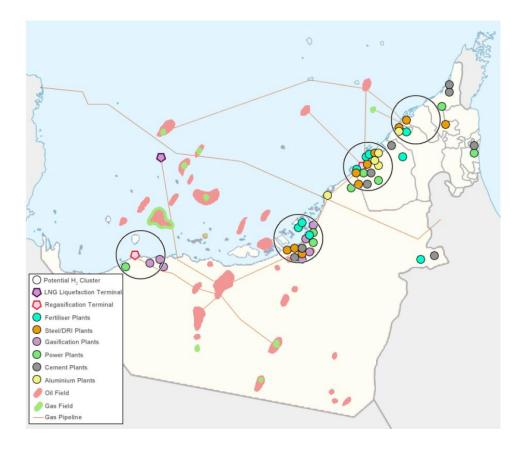
Case Studies: Comprehensive Report on "the UAE's role in the global hydrogen economy" for UAE Ministry of Energy and Infrastructure, ADNOC, Mubadala, and ADQ



Report on the UAE's Role in the Global Hydrogen Economy

- The UAE's competitive advantage in blue hydrogen production, includes reliable and cost-competitive hydrocarbons, existing large-scale hydrogen and ammonia production facilities, and large, wellcharacterised subsurface formations for carbon dioxide storage.
- In green hydrogen production, the UAE has excellent solar generation conditions, and the very low levelised cost of solar electricity generation achieved.
- Across all hydrogen projects, the UAE's competitive advantages include strong existing infrastructure such as port facilities, LNG terminals, gas pipelines, salt domes for hydrogen storage, a central geographic location between key markets, and a stable, businessfriendly and innovative approach.
- The country also enjoys a sophisticated, large-scale network of refining and petrochemical facilities

Hydrogen Clusters in the UAE

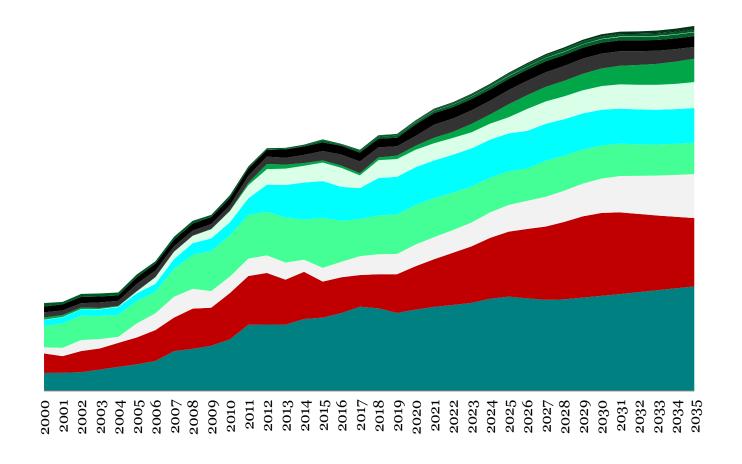




Case Studies: MENA gas demand outlook – Report on the current and future outlook of the region's gas demand

Gas Consumption

Units: BCM/y



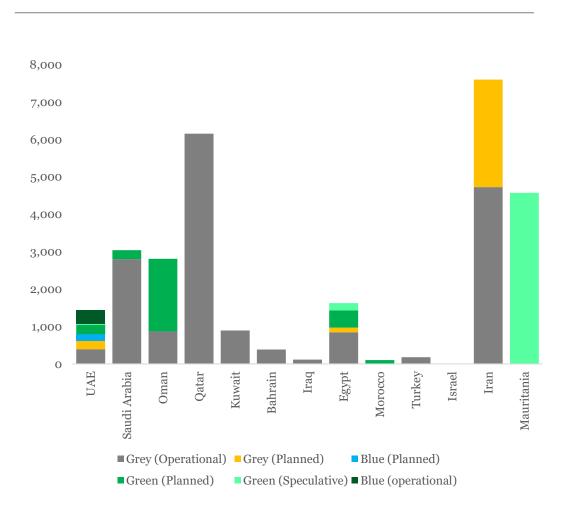
- Year of Study: 2020
- Client: confidential
- Analyse MENA gas demand by sector and country
- Include main drivers of gas pricing, availability, power and industry growth, competing / alternative fuels (oil, coal, nuclear, renewables)
- Examine sensitivity to climate, subsidy reform, other policies
- Draw key conclusions for government and gas company decision-making



Case Studies: Feasibility study for hydrogen development across MENA, Turkey, and Central Asian countries

MENA Hydrogen Production by type and status

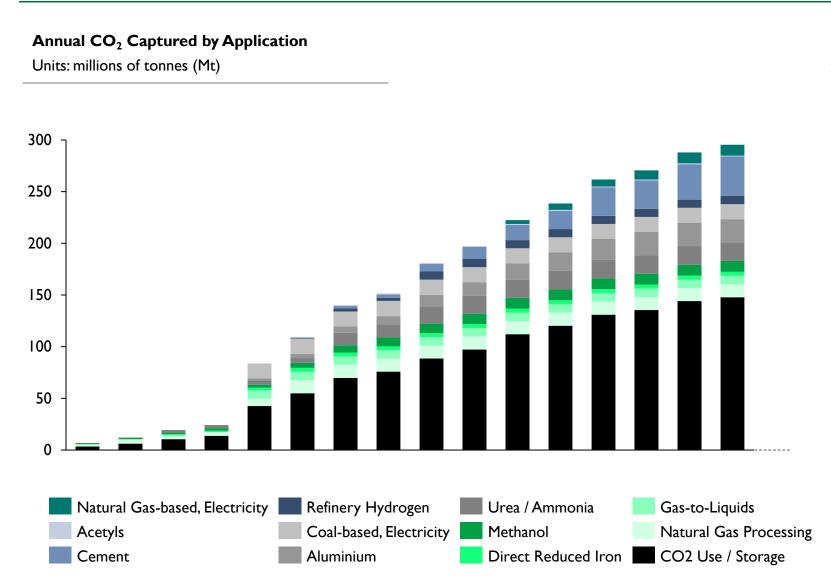
Unit: t/y



- Year of Study: 2021 ongoing
- Client: Asian Government
- Developed a feasibility study for hydrogen development in the MENA region, provided a country-level analysis of regulatory policies, solar and wind resources, installed capacities, natural gas reserves, CCUS projects, CO₂ storage capacity, and hydrogen R&D.
- Mapped out potential export markets and financers.



Case Studies: Feasibility study on CCUS potential in the MENA region – study of the regulatory, political, economic, and technical landscape for carbon capture and storage across the region



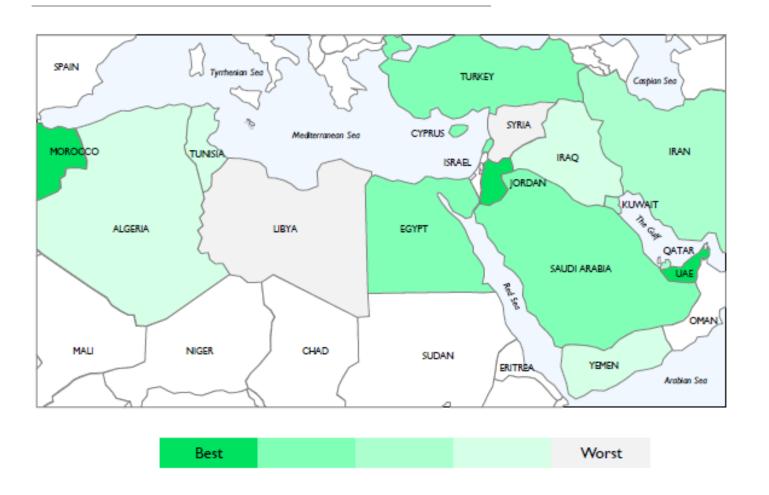
- Year of Study: 2019
- Client: confidential
- Information gathering, proprietary database and model, and interviews with highranking government officials
- Estimates of the CO₂ supply and demand by sector and capture / storage opportunity
- Market analysis and intelligence
- Specialised regulatory and investment assessment
- Comparative analysis
- Insights and recommendations



Case Studies: Evaluation of MENA sustainable energy market trends, identification of potential investment areas, market sizing, growth potential, and competitive landscape

Sustainable Energy Readiness of the MENA Region

Illustration



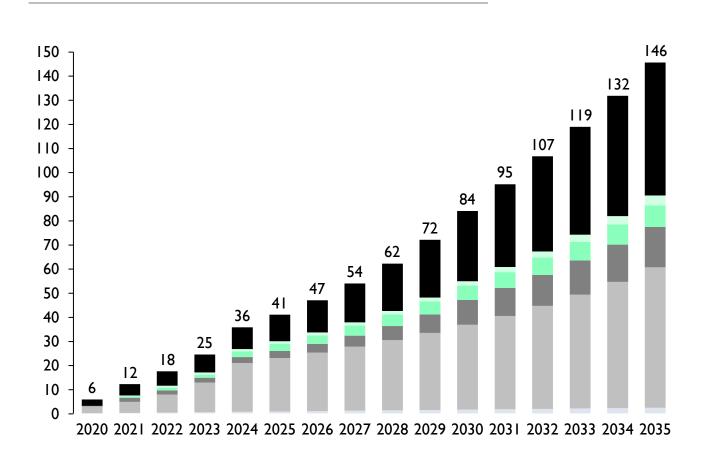
- Year of Study: 2020 Ongoing
- Client: Confidential
- Identified sustainable energy market trends, including CCS, in the Middle East
- Segmented the market by sector, product and region to identify possible investment areas
- Evaluated sub-sectors to identify market size, value chains, profitability, regulatory constraints; identify competitive landscape and key players
- Evaluated key conclusions for client's investment requirements, returns and risks



Case Studies: Comprehensive and detailed assessment of the GCC's solar energy market, key stakeholders and policies to identify partnership with European companies

Projected Solar Installation in the GCC by 2030 (GW)

Units: GW

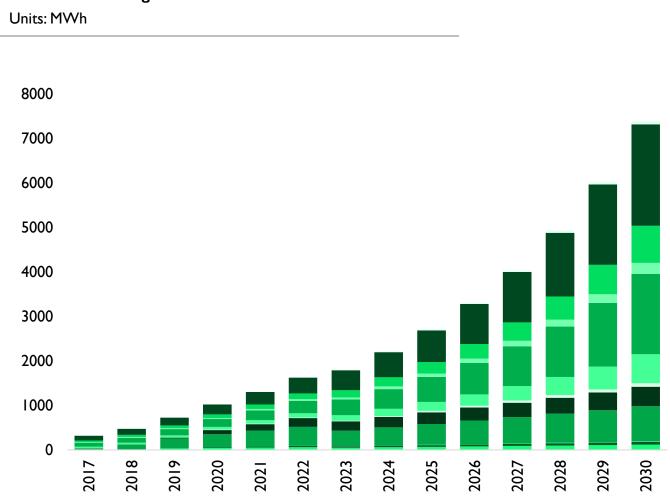


- Year of Study: 202 I
- Client: European Government (Confidential)
- Developed a detailed analysis of the GCC's solar energy market, mapped key stakeholders and initiatives pertaining to solar uptake
- Developed a comprehensive assessment of existing federal and state-level policies, market, and regulatory frameworks
- Identified conducive partnership opportunities between European solar companies and local GCC solar / renewable energy companies



Case Studies: Middle East strategy for battery deployment, energy storage technologies, and deployment of solar PV + storage for demand side management strategies





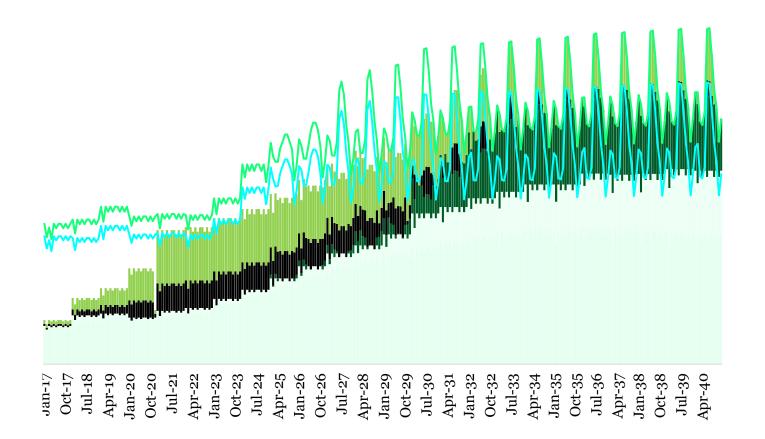
- Year of Study: 2018
- Client: Confidential Client
- Forecast energy demand and production capacity growth
- Formulate a Middle East strategy for battery investment, development and deployment by sizing the battery market and specific niches
- Identify strategic partners for potential investment in RE power generation in MENA



Case Studies: Iraqi Kurdistan & Turkey natural gas markets study - developing a gas market assessment to facilitate functioning gas market design in Kurdistan and assess exports to Turkey

Gas Consumption

Units: BCM/month



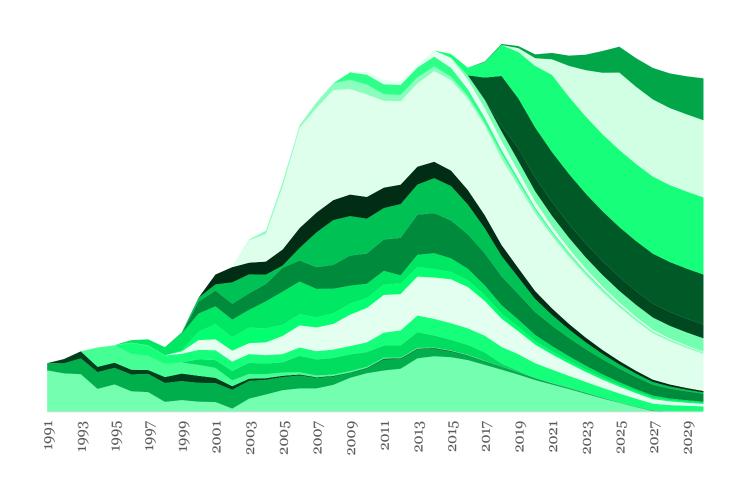
- Year of Study: 2020 Ongoing
- Client: US DOE
- Compile gas and power model of Iraqi
 Kurdistan and Turkey including major
 consumers, supply and demand balance
- Include main drivers of gas pricing, availability, power and industry growth, competing / alternative fuels (oil, renewables)
- Analyse natural gas and power markets data, including recommendations for reforming gas and power pricing
- Recommendations to help expand
 Kurdistan gas into new markets



Case Studies: East Mediterranean gas demand and supply – gas market design, regulatory structure of key physical infrastructure facilitating access to gas markets

Gas Consumption

Units: BCM/month



- Year of Study: 2015
- Client: International Oil Company
- Advise on market design and regulatory structure; politics
- Provide overview of key physical infrastructure facilitating access to gas markets and gas/power sector growth: 2015 – 2030
- Analyse competition, gas price and supply overview 2015 – 2030



Case Studies: Other projects and assignments in the Clean/New Energies Segment



Project Description

Project Name: Scaling CCUS in differing jurisdictions

Year: 2023

Client: DWF United Kingdom

 Deliverable: Assessment of the key risks to scalingup and improving commercial deployment of CCUS across a complex legal/regulatory landscape

Implementation

- Developed a detailed analysis of the Middle East, EU, US, Australian CCUS market, mapping key stakeholders and policies
- Developed a comprehensive assessment of existing federal and state-level policies, market and regulatory frameworks
- Identified conducive opportunities private and public actors, as well as G2G mechanisms that can help improve CCUS commerciality in the race to net-zero



Project Description

Project Name: The European Hydrogen Strategy Report

Year: 2020

Client: DWF United Kingdom

 Deliverable: Assessment of the European Union's hydrogen strategy

Implementation

- Examined the European Union's hydrogen strategy and the policy mechanisms required for different hydrogen applications
- Conducted a comparative analysis of the European Union's member countries' hydrogen strategies, including recommendations to unlock growth and partnership opportunities



Jumeirah Lake Towers Cluster M, HDS Business Centre 33 | 32, Dubai United Arab Emirates

> info@qamarenergy.com qamarenergy.com +971 4 364 1232

CONTACT