

*Policy Brief*

# THE WATER, ENERGY & FOOD NEXUS

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*Reframing Gulf Climate & Foreign Policy*

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In the early weeks after the US-Iran escalation around the Strait of Hormuz, the crisis was narrated through a familiar vocabulary of oil flows, gas markets, tanker movements, price volatility, and insurance risk. The language was immediate, recognizable, and not wrong. Energy is the first lens through which the world understands the Gulf. Yet the region's modern resource system is built on a deeper chain. Energy does not end at export. It returns home as water through desalination, as cooling through electricity, as food through logistics, and as industry through production. Energy is the thread that holds together systems usually discussed separately.

The Strait of Hormuz crisis is treated mainly as an energy crisis. However, in the Gulf, it is an energy nexus crisis: The disruption also travels through water and food systems. The water-energy-food nexus is therefore not only an issue of resource management, but also a foreign policy question. Any negotiation over Hormuz, sanctions, maritime access, reconstruction, or de-escalation will shape the systems which Gulf societies depend on. The six Gulf Cooperation Council (GCC) states sit at the intersection of three pressures that are often managed separately: limited renewable freshwater resources, energy intensive desalination, and high food-import dependence. This Brief argues that the GCC should operationalize this nexus as a foreign policy tool, converting shared vulnerability into system coordination, external credibility, negotiating leverage, and strategic partnerships.

## THE NEXUS AS SYSTEM

Academic literature often regards water, energy, and food security as separate challenges that require coordination. This framing is useful, but it captures only part of what makes the water-energy-food nexus strategically important in the GCC countries. The region's nexus challenges are distinctive because water, energy, and food create circular dependencies shaped by geography, infrastructure, and the political economy of the GCC states.<sup>1</sup>

Energy is the connective tissue, the Gulf's global strength, and the source of its domestic dependencies. Electricity powers desalination; hydrocarbons and industrial energy systems support fertilizer production, petrochemicals, cooling, transport, and industrial output. Energy exports generate the revenues that finance food imports, national infrastructure, and strategic reserves. When energy flows are disrupted, the impact does not stay in commodity markets, it travels through the wider resource system.

Water security offers the clearest example of the nexus at work. Across the Gulf, water is increasingly produced as much as extracted. Desalination sustains cities, industry, and national development, yet it depends on continuous power, operational

reliability, and industrial planning. Many societies discuss water through rivers, rainfall, and aquifers. In the Gulf, water security has to be understood through turbines, grids, treatment systems, and the energy system that makes large-scale desalination possible.

Food completes the loop. Agriculture remains the largest water-consuming sector in GCC economies, while domestic production is constrained by land, heat, and water availability. Food security therefore requires more than expanding domestic production. It depends on how energy, water, trade, technology, and diplomacy are utilized in coordination to keep food available and affordable.

The 2017 boycott of Qatar demonstrated how quickly pressure in one domain can reorder the entire system. Prior to the boycott, Saudi Arabia and the United Arab Emirates (UAE) accounted for nearly 40% of Qatar's food imports. Once land routes closed, Doha established emergency trade routes with Türkiye and Iran, deepening relationships that persisted beyond the immediate crisis. What began as a food disruption became a question of energy intensive logistics, water allocation, diplomatic positioning, and national resilience. It also showed that nexus shocks reshape trust and the meaning of self-reliance.

## PORTS AS THE PHYSICAL MANIFESTATION OF THE NEXUS

The current crisis carries lessons of the water-energy-food nexus into the maritime corridors defining the Gulf's external exposure. The nexus becomes visible at the places where national resilience relies on movement, notably ports. They are where the exports that fund Gulf economies meet the imports that keep those economies functioning. Energy and petrochemicals move out, while food, equipment, treatment inputs, and industrial components move in. The same commercial relationships, insurance systems, shipping schedules, and labor forces keep those flows moving.

This is why maritime disruption in the Gulf affects sectors beyond shipping. A port delay can slow industry, and prolonged rerouting can reshape food costs. A notably example on a global scale is fertilizer. It is produced through energy systems, traded through maritime corridors, and used in agricultural systems far from the conflict itself. A disruption that begins as an energy or maritime shock can affect planting seasons in Africa and South Asia months later.

Ports are the physical manifestation of the energy, food, and water nexus because all three systems require the same maritime infrastructure. The recent rerouting of cargo through Omani ports, UAE land bridges, and Saudi Red Sea routes showed

that the region can improvise under pressure. But it also showed that much of this coordination remains ad hoc rather than institutionalized.

## EXTERNAL PRESSURES

External pressures are turning coordination from an aspiration into a strategic requirement. The first pressure is physical. The Strait of Hormuz remains one of the world's most critical chokepoints, with the International Energy Agency estimating that around a quarter of global seaborne oil trade moves through it. Current reporting on alternative routes shows that existing bypass capacity remains limited. Saudi Arabia and the UAE have partial alternatives, while proposed routes through Iraq, Oman, and Jordan remain constrained.

The second pressure is regulatory. The European Union's Carbon Border Adjustment Mechanism entered into force on January 1, 2026 after its transitional phase, and its implications affect all aspects of the nexus. Gulf fertilizer exports, produced through gas-intensive ammonia synthesis, will carry a carbon cost at the European border. Gulf hydrogen projects, which depend on the same desalinated water and renewable power that sustain domestic systems, will need verifiable carbon accounting to qualify for European offtake. Aluminum and cement, the sectors that anchor Gulf industrial cities, will face price signals that link domestic resource decisions to external market access. The region is beginning to treat this as an opportunity rather than a burden. For example, Oman's adoption of international carbon accounting through the Meezan platform signals a positioning as a transparent partner in Europe's energy security.

The third pressure is the accelerating global response to energy insecurity. The European Union has adopted policy measures aimed at easing the energy shock like accelerating electrification reducing dependency on imported gas. Demand for solar and clean energy has also surged in the wake of the Hormuz crisis. For the Gulf, this acceleration cuts both ways. It raises the long-term value of the region's potential clean energy exports, particularly hydrogen and its derivatives, while signaling that the hydrocarbon revenue underpinning domestic water, power, and food systems faces sustained pressure from the very markets the region supplies. The harder constraint is delivery. As analysis of the clean energy transition has noted, the binding question has shifted from price to delivery: whether a supplier can actually move product at scale, which depends on grids, permitting, skills, and supply chains. Volume announcements alone no longer secure offtake. These dynamics reach the GCC through frontier sectors like green hydrogen<sup>2</sup> and Artificial Intelligence (AI), where future competitiveness will depend less on isolated national strategies and more on regional systems making delivery credible.

## NEXUS AS STATECRAFT

Treating the water-energy-food nexus as a foreign policy concern is not a call to instrumentalize crisis but a recognition that geopolitics shape Gulf water, food, energy, and industrial security. If these systems bear the consequences of escalation in the US-Iran war, the GCC states cannot remain peripheral to the terms of its resolution. Alongside the security argument, the nexus gives the Gulf a civilian resilience argument for being at the table.

Green hydrogen is the clearest example of the nexus' foreign policy implications. Beyond being an export story, green hydrogen requires renewable power, desalinated water, industrial production, ports, fertilizer, and potentially controlled environment agriculture. The same infrastructure enabling the electrolysis that produces green hydrogen can also support food security initiatives, cold chains, and water efficient production systems.

Hydrogen shows how a single frontier sector can deepen fragmentation or become a platform for regional nexus coordination. The problem in hydrogen sits upstream of project competition, in the regulatory process that determines whether GCC-produced molecules qualify as green at the European border. Five EU member states are currently lobbying Brussels to relax compliance criteria under the Renewable Fuels of Non-Biological Origin framework, a move designed to ease conditions for European industrial users and producers. The same relaxation weakens the competitive position of non-EU suppliers whose projects were designed to meet the original standard. The EU member states' response to bilateral concerns raised has been to 'grandfather' some early-mover projects, exempting them from new regulations. Nevertheless, this leaves the much larger pipeline of projects still in development exposed to whatever revised framework emerges. Producer countries elsewhere have begun pushing back collectively. However, no equivalent GCC bloc position has emerged. This is the moment the bloc has both the standing and the incentive to act together, and the absence of a coordinated voice is its own form of fragmentation.

Two GCC officials have already pointed to where the coordination work needs to happen. Saudi Arabia's Minister of State for Foreign Affairs Adel Al-Jubeir highlighted the gap between global calls for green hydrogen and the readiness of importing industries to purchase it. Oman's Minister of Energy and Minerals Salim Al-Aufi cautioned against shifting EU green hydrogen regulation while projects remain under development. A GCC-level effort toward interoperable certification and mutual recognition with key markets could respond to both concerns and reinforce credibility at the border. India's green ammonia offtake commitments, China's acceleration in green hydrogen, and Europe's renewed clean energy push show that demand signals for green hydrogen

are strengthening, even if costs and delivery constraints remain difficult. A regional approach would not erase competition between Gulf projects, but it could make the Gulf more legible as a supplier system. This illustrates how nexus integration generates diplomatic options unavailable through single sector approaches. Gulf states can offer partners a broader resilience package: clean power, water expertise, fertilizer stability, and the infrastructure reliability that makes all three credible. This is how the nexus becomes statecraft.

The AI sector follows this same logic. Data centers require electricity, cooling, land, water planning, and access to external technology. Early coordination through water efficient cooling standards, grid planning, and shared principles for technology partnerships could help the region avoid reproducing familiar vulnerabilities in a new sector.

## THE COORDINATION GAP

The central obstacle to broader coordination is the conversion of awareness into shared architecture. The region has long understood the risk of fragile trade corridors. One example is the Arabian Sea pipeline, a proposal first raised in the 1970s and revived during periods of heightened concern over Hormuz. Its significance lies less in whether it is immediately feasible and more in what it reveals: Gulf states have known for decades that a single maritime corridor cannot carry the full weight of regional security forever.

Current rhetoric around resilience has brought back the issue of alternative trading corridors and with it a broader set of questions: If the vulnerability is shared, how would such a project work in practice? Who would finance, secure, regulate, and benefit from it? Would it function as a national bypass, a bilateral arrangement, or part of a wider GCC resilience architecture? The energy nexus widens the corridor debate, prompting strategic consideration of complementary infrastructure like water buffers, food reserves, and clean export corridors. Despite open questions, the region can coordinate in these technical areas before every political disagreement is resolved.

The GCC is not starting from zero. The GCC Unified Water Strategy recognized the need for integrated water management, while GCC institutions and ministerial channels have addressed food security, water cooperation, and sectoral resilience.<sup>3</sup> Recent regional language has also become more explicit. The statement from the March 18, 2026 consultative ministerial meeting between Bahrain, Kuwait, Qatar, Saudi Arabia, the UAE, Azerbaijan, Egypt, Jordan, Lebanon, Pakistan, Syria, and Türkiye in Riyadh listed oil facilities and desalination plants alongside airports, residential buildings, and diplomatic premises as civilian infrastructure. An April 2026 statement by GCC ministers of tourism similarly named ports, airports, energy facilities, and desalination plants as protected civilian infrastructure. While previous declarations had acknowl-

edged cooperation in these different fields, they are increasingly appearing together inside a wider resilience conversation.

While regional debates about unified defense strategies remain politically difficult because threat perceptions, escalation thresholds, and external security relationships differ across the GCC, technical coordination offers a more immediate path. It can begin with the systems that keep societies functioning, without requiring instant agreement on every security question.

## **GCCIA AS PRECEDENT**

A remarkable precedent for such cooperation already exists. The [GCC Interconnection Authority](#) (GCCIA) was established in 2001 to connect the national power grids of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the UAE. Operations began in late 2009, creating a regional grid designed to share reserves, support peak demand, provide ancillary services, and reduce the risk of blackouts.

What makes the GCCIA important is its design principle. It created real interdependence without requiring a single electricity market or the surrender of sovereign control. Each state retained authority over its domestic grid, while the interconnection created a shared emergency layer. The GCCIA prevented partial or total blackouts in [more than 1,950 incidents](#) in its first eleven years and generated economic savings of over USD 2.6 billion, against capital costs of around USD 1.5 billion.

The GCCIA began without a grand theory of unity but with a technical problem every state recognized and a mechanism that made each state more secure without making it less sovereign. The question now is whether the same planning logic can extend across the water-energy-food nexus. Could the GCC build strategic complementarities in seed reserves, water planning, energy pipelines, fertilizer continuity, port access, and low carbon export infrastructure? Could technical coordination move faster than political coordination while still producing strategic value?

## **TOWARD REGIONAL NEXUS GOVERNANCE**

A workable path begins with shared visibility. The GCC needs to see risk together before it can coordinate mitigation. A nexus risk platform could bring water buffers, grid stress, food exposure, critical inputs, fertilizer flows, and corridor vulnerability into one operational picture. Shared data would help identify where cascading risks are building. From there, contingency planning becomes more practical. The purpose would be to map where capacity in one state can ease exposure in another during moments of stress. Water, food, ports, and grid support would remain nationally governed, while being planned with greater awareness of how pressure travels across

the wider system.

Credibility follows. External markets increasingly reward consistency, especially as carbon accounting and certification begin to shape access to future markets. A more aligned GCC approach would reduce friction for partners and allow the region to present a clearer, more trusted offer to Europe and Asia. Strategic leverage grows from that foundation. Once the region can see shared risk, plan around it, and speak more consistently to external markets, it can move beyond parallel national strategies toward partnerships that combine its strengths. The offer becomes less about separate projects and more about regional reliability.

Alternative trading corridors should sit inside this logic. They are necessary for resilience, while still needing to preserve the principle of freedom of navigation. Optionality is insurance against coercion while diplomacy works to preserve open passage.

## CONCLUSION

The current crisis has unsettled the assumption that Gulf resilience can be built through national strength alone. A region can be wealthy, technically capable, and globally connected, yet still discover that its most essential systems are exposed at the same narrow points of pressure. The nexus reveals how energy, water, food, and industrial security are linked and become questions of diplomacy when their continuity depends on corridors, standards, and negotiations beyond any single capital.

For the GCC, the task ahead is to design forms of cooperation that can survive political difference. The region has already shown that sovereignty and shared infrastructure can coexist when benefits are practical, risks are mutual, and the mechanism is trusted. The aim is to move beyond one successful model and into wider resource systems defining GCC stability and bargaining power.

This is where the nexus becomes foreign policy. It gives the Gulf a clearer language for engaging negotiations whose consequences will outlast the immediate crisis. Peace talks, maritime arrangements, and reconstruction dialogues will shape how the region lives and trades. The GCC's role should extend beyond absorbing decisions made elsewhere; it should help define the resilience it needs before the next shock arrives.

## About the Author



Rumaitha Al Busaidi is a leading voice in Oman's green hydrogen sector, whose work focuses on the Water, Energy, and Food (WEF) Nexus as a foreign policy and sustainability framework for the Gulf. In April 2025, she helped launch the world's first liquid hydrogen corridor for Oman, alongside His Majesty the Sultan and the King of the Netherlands. A graduate of both the Harvard Kennedy School & the University of Oxford, she has been recognized by the BBC 100 Women list, Reuters Top 25 Women in Climate, and Fast Company's Most Creative People in Business.

## ENDNOTES

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