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Punit Oza

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HORMUZ, HOUTHIS, HEMSIPHERES, HEATINGS, HOLIDAYS & HARVEST

Punit Oza ¹

Abstract

This working paper examines a compounding oil supply shock forming ahead of the 2026–27 Northern Hemisphere winter, arising from the simultaneous degradation of two critical maritime chokepoints: the Strait of Hormuz and Bab el-Mandeb, disrupted by the ongoing US–Israel–Iran conflict and Houthi activity in the Red Sea, and the Panama Canal, constrained by El Niño-linked drought. The paper argues that the impact of this dual disruption is asymmetric by geography, since roughly ninety percent of the world's population - and a disproportionate share of global economic affluence - resides in the Northern Hemisphere, where winter heating is an inelastic, twenty-four-hour requirement rather than a discretionary expense of the kind associated with summer cooling demand. This demand shock coincides with a historically depleted US Strategic Petroleum Reserve, the recent shutdown of Saudi Arabia's East–West Pipeline following drone attacks, a concentrated holiday travel season spanning Thanksgiving, Diwali, Christmas, New Year, and Chinese New Year, and a parallel fertilizer supply disruption threatening the 2026/27 Southern Hemisphere sowing season in Brazil, Argentina, Uruguay, and Australia, with downstream implications for 2027 global food prices. The paper presents best-, middle-, and worst-case scenarios for global trade and energy markets, situates the disruption within an accelerating geopolitical realignment around BRICS, and applies the Maritime NXT A.R.E.A. framework (Alliances, Relationships, Execution, Assets) to outline preparatory strategies for shipping and trade-exposed companies.

Keywords: *Strait of Hormuz, Bab el-Mandeb, Panama Canal, El Niño, strategic petroleum reserves, winter energy demand, fertilizer supply chain, BRICS, maritime chokepoints, A.R.E.A. framework*

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Introduction

Two of the world's most critical maritime energy arteries are degraded at the same time, for entirely different reasons — one is war, the other is weather.

War: Hormuz and the Red Sea. Since February 28, 2026, the Strait of Hormuz — normally responsible for roughly a quarter of the world's seaborne oil trade — has operated under sustained disruption from the US–Israel–Iran conflict, with Iranian forces laying mines and attacking shipping. An April ceasefire and a June memorandum of understanding both broke down when hostilities resumed in July. On September 10–11, drone strikes launched from Iraq hit Saudi Arabia's East–West Pipeline — the kingdom's main bypass route around Hormuz, capable of moving up to seven million barrels a day — forcing Saudi Aramco to shut it down as a precaution. With no ready alternative to redirect that crude, oil broke above one hundred dollars a barrel for the first time in months, and the IEA reported that Saudi crude supply had fallen to its lowest level in more than three decades. Compounding this, Houthi forces have captured Perim Island in the middle of the Bab el-Mandeb Strait, bringing them close to controlling a second vital energy gateway linking Europe and Asia.

Weather: Panama. Independently, the Panama Canal is heading into its dry season under strain. Watershed rainfall from May through August 2026 ran roughly a third below the long-term average, prompting the Panama Canal Authority to cut daily transit capacity from thirty-six to thirty-four vessels, with a further cut to thirty-two effective mid-September. Roughly 3.2 million barrels per day of crude, condensate, and refined products transited the canal in the second quarter alone. The decisive test arrives in the December 2026–April 2027 dry season, which sits squarely inside the northern winter. One chokepoint is failing because of conflict; the other because of climate. Both are degrading in parallel, heading into the same seasonal window.

Hemispheres: Why Ninety Percent of Humanity Feels This First

About ninety percent of the world's population lives in the Northern Hemisphere, which also holds the large majority of the planet's landmass and the three most populous countries — China, India, and the United States. That concentration is not incidental to this story; it is the story. A supply shock centered on Hormuz, the Red Sea, and Panama lands overwhelmingly on the hemisphere that also happens to be entering its coldest, most fuel-intensive months. The Southern Hemisphere — with its much smaller population share — is heading into summer, where energy demand is far less exposed to the same shock. The geography of population and the geography of the calendar are working against the north at exactly the same time.

The Vanishing Buffer: Strategic Reserves Run Dry

The world entered this crisis with less of a cushion than it had in prior shocks. The US Strategic Petroleum Reserve — drawn down through 172 million barrels released and loaned out under IEA coordination — fell to approximately 319–357 million barrels by July 2026, the lowest level since 1983, against an authorized capacity of 714 million barrels. Analysts have flagged the depletion of global strategic reserves as among the biggest risks to the world economy in the second half of 2026, since the buffer that historically absorbed supply shocks is now itself shrinking. The United States is positioned to refill faster than other IEA members because of exchange agreements returning borrowed barrels plus a premium, but for most other reserve holders, replenishment is discretionary and pushed into 2027.

Layered on top of the reserve drawdown is the loss of Saudi Arabia's main workaround: with the East–West Pipeline shut and Hormuz still effectively constrained, the kingdom has no ready substitute route to keep its usual export volumes flowing. Meanwhile, with Russia's war grinding on and the Iran conflict cycling through ceasefires that repeatedly collapse, there is no fixed diplomatic timeline in sight for either conflict to resolve before the northern winter sets in — meaning markets may have to absorb both a thinner reserve cushion and a still-live supply disruption through the coldest months, rather than one or the other easing first.

Heating versus Cooling: Why Winter Hits Differently - and Harder

Summer cooling demand is price-elastic: air conditioning use and summer travel can be delayed, reduced, or substituted when prices rise. Winter heating is not. It is a twenty-four-hour survival requirement across the population centers most exposed to this shock — the US Northeast, Europe, Northeast Asia — and households cannot simply turn off the furnace when oil or gas prices spike the way they might defer a flight or a road trip. A second asymmetry works against affordability: the Northern Hemisphere's exposed population is also, on average, considerably more affluent than the Southern Hemisphere's. That affluence means demand is less likely to collapse in response to price increases — the market can bid prices higher before consumption meaningfully falls, which is precisely the condition that allows a supply shock to translate into a larger, more sustained price rise rather than being self-limiting. A further wildcard sits on top of this dynamic: forecasters have flagged the possibility that this winter's El Niño pattern could bring a more severe cold season to parts of the Northern Hemisphere, pushing heating demand even further above its already-inelastic baseline.

Holidays: The October – January Demand Spike

Compounding global energy pressures, seasonal logistics trigger a sharp demand convergence across the fourth quarter and into early winter. The same window that carries peak heating demand also carries the year's heaviest concentration of holiday air and road travel. Major observances including Diwali, Thanksgiving in North America, Christmas, New Year's, and Chinese New Year all fall within the October through February stretch, meaning aviation and transport fuel demand spikes at exactly the same time as heating demand, rather than at a different point in the year that might spread the load. Two of the most fuel intensive demand categories in the global economy, home heating and holiday travel, are stacked on top of each other, on top of a supply system already running two degraded chokepoints and a shrunken reserve buffer.

Harvest at Risk: Fertilizer, Sowing Season and 2027 Food Prices

The same disruption feeding into winter fuel markets is also feeding into the fertilizer supply chain, with consequences for a food-producing region on the opposite side of the planet. Gulf countries account for roughly thirteen percent of global nitrogen fertilizer exports and nine percent of phosphate exports, and ship traffic through Hormuz has reportedly fallen more than ninety-five percent from its pre-war level, disrupting the oil, gas, and fertilizer flows that depend on it. Russia, a major fertilizer supplier, has separately restricted ammonium nitrate exports, tightening an already-strained global market.

Brazil, which imports the large majority of the fertilizer it uses domestically, has activated a crisis committee to secure phosphate and sulfur supplies ahead of its 2026/27 crop season, with industry groups reporting that only forty to forty-five percent of the fertilizer needed for the coming season had been purchased as of mid-2026, and fertilizer imports through the port of Paranaguá down sharply year on year.

Argentina, Uruguay, and Australia sit in a similar position: all are meaningfully import-dependent for nitrogen and phosphate inputs, and all are entering their own sowing windows (Argentine wheat sowing runs May through August, with soybean planting September through November, and Brazilian corn-planting decisions falling between July and November) during exactly the period when fertilizer availability and pricing are least certain. A shortfall or price spike hitting this planting cycle in the Southern Hemisphere's key grain belt has a direct read-through to 2027 crop yields and global food prices, arriving as a second-order shock on top of the energy story.

Best, Middle and Worst Case: Implications for Global Trade

Best case. Hormuz de-escalates, the East–West Pipeline is repaired and reopened quickly, and Panama's dry season comes in close to average. Reserve refilling begins on schedule and fertilizer supply chains stabilize in time for the Southern Hemisphere's main planting windows. Oil prices ease back toward the oversupply scenario most forecasters had assumed before September, heating and food costs stay manageable, and the shock is remembered as a sharp but contained episode.

Middle case (most likely). Hormuz and the Red Sea settle into a state of managed friction — reduced flows, elevated war-risk premiums, intermittent attacks — while the pipeline is only partially restored and Panama's dry season deepens on schedule. Reserves stay thin through winter with only the United States refilling meaningfully. Fertilizer shortages partially materialize, raising costs into the 2026/27 Southern Hemisphere harvest without derailing it outright. The result is a persistently elevated price floor for oil, heating fuel, and food, punctuated by sharp spikes on any single new incident, rather than one sustained crisis.

Worst case. The East–West Pipeline stays offline for an extended period while Hormuz and Bab el-Mandeb both remain constrained; a worse-than-forecast Panama drought compounds the routing problem; reserves across most IEA members remain undermined into 2027 with no coordinated replenishment. Fertilizer shortfalls bite hard enough to meaningfully reduce Southern Hemisphere plantings, pushing 2027 food prices sharply higher on top of an already-stressed winter energy market. This is the scenario where energy and food inflation compound each other simultaneously, across both hemispheres, at the same time.

The Perfect Storm – and the Realignment Behind It

Taken together, these threads point toward more than a seasonal price spike: a war driven chokepoint, a climate driven chokepoint, a thinner reserve buffer, inelastic winter demand from an affluent population, a stacked holiday travel season, and a fertilizer shock threatening next year's harvest are converging on the same several months. This is plausibly the setup for a genuine perfect storm, one that does not just move prices, but reshapes which trade lanes matter and which countries hold leverage over them.

That reshaping is already visible at the alliance level. BRICS has expanded to include Saudi

Arabia, Iran, the United Arab Emirates, Egypt, and Ethiopia, giving the bloc control of a large share of global oil production and reserves and renewed momentum behind de-dollarizing energy trade. Argentina was also invited to join in the original 2023 expansion but formally declined under President Javier Milei in December 2023, citing a foreign policy alignment with the United States and Israel. The current crisis, with Gulf producers exposed to Western-aligned chokepoint risk and Russia and Iran both under sanction, gives the remaining members shared incentive to accelerate that realignment rather than slow it down. The BRICS summit cycle looks less like an isolated diplomatic event and more like an early marker of a longer shift in where power over energy and trade routes ultimately sits.

Preparing for the Perfect Storm – The A.R.E.A Framework

Alliances: Diversify charter counterparties, war-risk and P&I cover, and fertilizer or commodity sourcing away from concentrated Gulf or single-bloc exposure; build relationships with alternate-route terminal operators and non-traditional suppliers, including BRICS-aligned producers, before the next disruption forces the search.

Relationships: Keep direct lines open with bunker suppliers, heating-fuel distributors, and fertilizer producers across multiple geographies now; in the middle and worst-case scenarios, allocation, not just price, becomes the binding constraint on all three.

Execution: Build Hormuz and Red Sea transit-clause riders into charters with Gulf exposure through the first quarter of 2027; pre-stage rerouting triggers such as draft thresholds, war-risk zone changes, and pipeline status rather than deciding under pressure; monitor Southern Hemisphere planting progress as a leading indicator of 2027 food-price risk.

Assets: Reassess vessel deployment and cargo mix now: lighter-loading through Panama's draft restrictions, repositioning tonnage away from double-exposed routes, and building flexibility into fertilizer and grain logistics ahead of the 2027 harvest cycle is far cheaper done now than in a winter scramble.

Conclusion

This winter does not need a single dramatic event to hurt. It needs a war-degraded chokepoint, a drought-degraded chokepoint, a thin reserve cushion, and a stacked demand season to all stay exactly as they are for a few more months, while a slower-moving fertilizer shock quietly sets up next year's food prices on the other side of the planet. The realignment of alliances now underway suggests the trade map that emerges on the other side of this winter may look meaningfully different from the one that went into it.

REFERENCES

- CNBC. "Saudi Arabia shut down East-West crude oil pipeline after multiple attacks by drones from Iraq." September 11, 2026. <https://www.cnbcc.com/2026/09/11/saudi-arabia-shut-down-east-west-crude-oil-pipeline.html>
- Wikipedia. "2026 East–West Crude Oil Pipeline attack." https://en.wikipedia.org/wiki/2026_East%E2%80%93West_Crude_Oil_Pipeline_attack
- Bloomberg. "Saudi Arabia Closes Key East-West Oil Pipeline Following Multiple Attacks." September 11, 2026. <https://www.bloomberg.com/news/articles/2026-09-11/saudi-oil-pipeline-that-bypasses-hormuz-shut-after-attacks>
- CNN. "Saudi oil pipeline shut down after attack triggers fires." September 11, 2026. <https://www.cnn.com/2026/09/11/politics/saudi-arabian-oil-pipeline-hit-by-projectiles-triggering-fires>
- Al Jazeera. "Saudi Arabia shuts critical oil pipeline after drone attack: What it means." September 12, 2026. <https://www.aljazeera.com/news/2026/9/12/saudi-arabia-shuts-critical-oil-pipeline-after-drone-attack-what-happened>
- NBC News. "Saudi Arabia's shutdown of key pipeline limits oil flow as Yemen hits back against Houthis." September 12, 2026. <https://www.nbcnews.com/world/middle-east/saudi-arabia-shutdown-key-pipeline-limits-oil-flow-yemen-houthis-rcna597362>
- Fortune / Bloomberg. "Saudi pipeline to bypass Hormuz hits 7 million barrel goal." March 28, 2026. <https://dc.fortune.com/2026/03/28/saudi-arabia-east-west-oil-pipeline-strait-hormuz-bypass-7-million-barrels-yanbu-red-sea>
- New Straits Times. "AmBank flags depleting oil reserves as biggest global threat." July 17, 2026. <https://www.nst.com.my/amp/business/corporate/2026/07/1490981/ambank-flags-depleting-oil-reserves-biggest-global-threat>
- The Edge Malaysia. "Strategic Petroleum Reserve restocking outlook." July 18, 2026. <https://theedgemalaysia.com/node/810106>
- Industrial Info Resources. "U.S. Strategic Oil Reserves Lowest in Nearly 40 Years." June 17, 2026. <https://www.industrialinfo.com/news/article/us-strategic-oil-reserves-lowest-in-nearly-40-years--359149>
- PBOG Magazine. "U.S. Strategic Petroleum Reserves Fall to 357 Million Barrels." July 2026. <https://pboilandgasmagazine.com/u-s-strategic-petroleum-reserves-fall-to-357-million-barrels/>
- CNY Central / TNND. "US oil reserve levels fall to historic lows amid Iran conflict, Strait of Hormuz closure." 2026. <https://cnycentral.com/news/nation-world/us-oil-reserve-levels-fall-to-historic-lows-amid-iran-conflict-strait-of-hormuz-closure-white-house-untied-states-energy-russia-ukraine-barrels>
- Tank Terminals / Reuters. "Stocks of Oil in US Strategic Petroleum Reserve Falls to Lowest Since 1983." June 16, 2026. <https://tankterminals.com/news/stocks-of-oil-in-us-strategic-petroleum-reserve-falls-to-lowest-since-1983/>
- WorldAtlas. "Geography IQ Test: How Much Do You Know the World." <https://worldatlas.com/quizzes/geography-iq-test-how-much-do-you-know-the-world/16>
- Simple English Wikipedia. "Northern Hemisphere." https://simple.wikipedia.org/wiki/Northern_Hemisphere
- Agrolatam. "Russia halts ammonium nitrate exports, shaking global fertilizer markets." 2026. <https://www.agrolatam.com/news/russia-halts-ammonium-nitrate-exports-shaking-global-fertilizer-markets/>

- Agriland. "Global fertiliser outlook – how countries are weathering the crisis." 2026. <https://www.agriland.ie/farming-news/global-fertiliser-outlook-how-countries-are-weathering-the-crisis/>
- Food Security Portal. "The Iran war: Farmers in Brazil and Argentina face rising fertilizer and energy prices." 2026. <https://www.foodsecurityportal.org/node/3872>
- FreshPlaza. "Brazil seeks to secure fertilizer supplies for 2026/27 crop season." 2026. <https://www.freshplaza.com/africa/article/9852238/brazil-seeks-to-secure-fertilizer-supplies-for-2026-27-crop-season/>
- IICA / OPSAA. "Data or statistical facts on the situation and perspectives of agri-food systems and the impact of policies." 2026. <https://opsaa.iica.int/en/evidences?sectors=49>
- Datamar News. "Brazil warns of fertilizer supply risks and higher prices amid Middle East war." March 11, 2026. <https://datamarnews.com/?p=68359>
- Breakbulk News. "IEA Flags Power Shift as Oil Surplus and LNG Wave Redraw Global Energy Trade Routes in 2026." <https://breakbulk.news/iea-flags-power-shift-as-oil-surplus-and-lng-wave-redraw-global-energy-trade-routes-in-2026>
- Energy Intelligence. "New Routes Add Flexibility to LNG Trade." 2026. <https://www.energyintel.com/0000017b-a7c7-de4c-a17b-e7c771cf0000>
- Kpler Insight. "Natural gas and LNG: Top 5 market drivers for 2026." January 14, 2026. <https://www.kpler.com/fr/blog/natural-gas-and-lng-top-5-market-drivers-for-2026>
- GTR (Global Trade Review). "BRICS expands, but can the group de-dollarise trade?" <https://www.gtreview.com/news/global/brics-expands-but-can-the-group-de-dollarise-trade/>
- MNI Markets. "MNI Commodity Weekly: BRICS Meeting Highlights Changing Alliances Crucial for Oil Markets." August 23, 2026. <https://www.mnimarkets.com/articles/mni-commodity-weekly-brics-meeting-highlights-changing-alliances-crucial-for-oil-markets-2664301007>
- Sweet Crude Reports. "Western sanctions on Russia could push the BRICS alliance closer." <https://sweetcrudereports.com/western-sanctions-on-russia-could-push-the-brics-alliance-closer/>
- OBELA. "The BRICS and Oil: The Conflict in Iran." June 2026. <https://obela.org/node/3650>
- Philippine Daily Inquirer. "Argentina formally rejects BRICS membership." December 30, 2023. <https://newsinfo.inquirer.net/1881498/argentina-formally-rejects-brics-membership/amp>

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