



[Shale Gas: The Promise and the Peril](#) by Vikram Rao. Research Triangle Institute Press, 2012, 184 pages.

Vikram Rao's [Shale Gas: the Promise and the Peril](#) provides a critical overview about the role of the United States' vast shale gas resources in America's overall energy mix. Rao concisely forges an ambitious, comprehensive analysis on what shale gas exploitation means for environmental stewardship, transportation, national security, jobs, and America's geopolitical standing.

Rao begins by exploring the invention and refinement of hydraulic fracturing (or "fracking") that has paved the way for discovery of massive gas findings in tight shale rock formations beneath the earth's surface. Rao argues that the accessibility and vast quantity of natural gas render it the most cost-effective source of energy in the near- to medium-term, evidenced in part by its grabbing power generation market share from coal through natural market forces.

Rao's next section deals with addressing and/or rebutting environmental concerns associated with exploration, production, and use of shale gas. Rao describes the threat to surface water sources as "the most significant environmental hurdle faced by the industry" (p. 35). In order to address flowback water's potential to pollute surface water, Rao recommends a compromise of sorts, calling on producers to responsibly dispose of the water while requesting that the industry tolerate greater levels of salinity in water used for fracking.

Rao then turns to discussing avenues beyond electricity generation for exploiting America's wealth of shale gas. After a discussion on the potential for liquid natural gas to help keep open the vitally important (but currently faltering) Trans Alaska Pipeline System (TAPS), Rao spends the remainder of the section discussing natural gas' potential to affect the transportation industry. Rao argues that shale gas' predictably low prices and distance from consumer markets makes conversion of gas to transport liquids economically viable in the United States now. After taking into account practical, economic, environmental, and geostrategic considerations regarding each type of transportation fuel, Rao prescribes substituting gasoline with compressed natural gas (CNG) for public vehicles and light duty trucks, liquid natural gas (LNG) for long-haul trucks, and moving to flex-fuel vehicles that accept methanol (more specifically, a fuel comprised of 85% methanol, or M85) for private personal vehicles. Rao maintains that substituting methanol from natural gas in place of gasoline can save consumers nearly one-third of the cost at the pump while reducing carbon dioxide emissions and substantially reducing oil dependency.

Rao's final substantive section deals entirely with policy recommendations. The preponderance of Rao's recommendations fall to state and local levels in this section (though he does include federal policies targeting environmental goals briefly near the conclusion). Rao recommends that local governments ensure that communities, rather than solely private industry, realize the benefits of natural gas exploration through either taxes or impact fees on production that would then be fed back into local economies. Although Rao recognizes that natural gas exploitation

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will inevitably slow down the growth of renewable energy in both the electricity production and transport fuel sectors, he prescribes a number of policy measures, such as local- and state-taxes on high-carbon-footprint oil production, whose revenues could then subsidize exploration of renewables. Taken in sum, such policies could reinvigorate renewables' approach to price parity, while still allowing natural gas to serve as a bridge fuel until that point is reached. Rao also uses this section to promote using liquid natural gas (LNG) exports to undercut major international gas-exporting adversaries such as Russia and Iran.

Rao's experience as a former Chief Technology Officer of Halliburton may cause some in left-leaning circles to presuppose a distinctly pro-hydrocarbon bias in his analysis, which is understandable and perhaps fair. Yet while few readers would mistake Rao for a hardcore environmentalist, his thorough analysis does not spare either gas producers or the US local, state, and federal government a larger role in environmental stewardship. Indeed, Rao ends by recommending a number of further research projects on best practices for fracking, as well as state and even federal action to introduce regulations pertaining to well preventing water contamination, handling flowback water, and minimizing fugitive gas emissions.

While Rao's book is high on shale gas' promise, he still devotes plenty of ink to its peril, and spares neither the public nor the private sector their duty to manage the shale bounty responsibly. Even as the Obama Administration seeks to curb greenhouse gas emissions, the takeaway from Rao's analysis is that America's newest source of low-cost energy can be properly exploited, while addressing valid environmental concerns, to serve as a jobs-producing, geostrategic-shifting game changer now.

Mark Donig is an incoming first-year student at UC Berkeley School of Law who plans to focus on energy law and international law. His writings have appeared in CNN, Foreign Policy, the Washington Institute for Near East Policy, Jerusalem Post, and elsewhere.