"Frackademia" – MIT's Ernest Moniz, Obama's Top Candidate for Energy Secretary, Oversees Pro-Industry-Funded Research

By **Peter Mantius**, on February 21st, 2013

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Ernes Moniz, Obama's top candidate for Energy Secretary

Oil and gas companies are funding research at major universities to counter environmental objections to shale gas drilling. President Obama is considering appointing a key beneficially of industry monies at MIT as his new energy secretary.

The oil and gas industry has campaigned hard and paid handsomely for academic support for its media talking points.

Those efforts to justify and promote aggressive drilling for natural gas in shale formations recently erupted in scandal at three highly-regarded universities: Penn State University, the University of Texas at Austin and the State University of New York at Buffalo. Each time, critics of industry-friendly research ferreted out the university's failure to fully disclose industry ties and ran to the media, which reliably produced 'gotcha' stories and nicknamed the practice "Frackademia."

But those stories ignored or barely mentioned the energy industry's pervasive influence at an even more prestigious school: the Massachusetts Institute of Technology in Boston. MIT's brand as a reliable source of peerless science remains intact.

Even the ombudsman at *The New York Times* has been dazzled. When the newspaper's internal critic took issue with an investigative reporter's probe of the economic staying power of the shale gas boom in July 2011, he scolded the Times reporter for failing to incorporate more optimistic views, particularly MIT's. The school's motives were never questioned.

But a long-running squabble between MIT and a pair of professors from Cornell University has helped pull back the veil — even as Reuters reports that one of the school's leading energy experts is President Obama's favorite to become the next U.S. Secretary of Energy.

That professor, nuclear physicist Ernest Moniz, is director of the MIT Energy Initiative, a research arm that has received more than $125 million in pledges from the oil and gas industry since 2006, according to the Public Accountability Initiative, a non-profit that blew the whistle on UBuffalo.

The four "founding members" of MITEI — BP, Shell, Italy's ENI and Saudi Aramco — each agreed to pay $25 million over five years for the right to help manage research projects, maintain an office at MITEI headquarters and "place a researcher in a participating MIT faculty member's lab," according to the MITEI website. Ten "sustaining members" commit $5 million each for fewer rights, but still get seats on MITEI's executive committee and governing board.

A host of others energy interests, including the Clean Skies Foundation, have participated as well, funding and shaping MIT research.

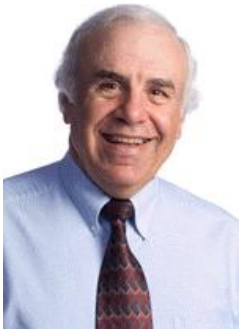
Clean Skies was founded and chaired by Aubrey McClendon, CEO of Chesapeake Energy Corp., the nation's No. 2 gas producer. At the time Clean Skies officials called on MIT with a research idea, Chesapeake had placed a large bet on high-volume hydraulic fracturing of shale formations, or fracking, by aggressively leasing land in shale regions.

The research produced by the MIT-Clean Skies collaboration was a May 2011 report called **"The Future of Natural Gas."** In its acknowledgements, the Moniz team wrote: "Discussions with the (Clean Skies) Foundation led to the conclusion that an integrative study on the future of natural gas in a carbon-constrained world could contribute to the energy debate in an important way, and the Foundation stepped forward as the major sponsor."

Other acknowledged major funders of the study included the Hess Corp., Agencia Nacional de Hidrocarburos of Colombia, the Gas Technology Institute and Exelon.

"The Future of Natural Gas" was a magnum opus that crowned natural gas as the "bridge to a low-carbon future." It cited vast new supplies of cheap, clean-burning gas from shale drilling and recommended a switch from coal to natural gas in U.S. electric power generation, industry and transportation.

But just weeks before the planned rollout of the MIT report, Robert Howarth and Anthony Ingraffea of Cornell published (with Renee


Anthony Ingraffea

But just weeks before the planned rollout of the MIT report, Robert Howarth and Anthony Ingraffea of Cornell published (with Renee Santoro) a peer-reviewed study that suggested that natural gas might aggravate climate change as much or more than coal — challenging the MIT report's very thesis.

The Cornell team, financed by a mid-sized Ithaca, N.Y., foundation rather than energy giants, pointed to alarming methane leaks at hydraulically fractured shale gas wells. They concluded that the leaks are hard to quantify but potentially very significant.

The Howarth team members didn't measure methane leakage themselves. They acknowledged the shortcomings of their data and urged other independent scientists to get busy measuring methane leaks from gas drilling well pads, compressor stations and the often-antiquated pipelines that carry gas to the end user. "The quality of the data is terrible because the industry is very secretive and not very honest," Howarth said.


Robert Howarth

The Cornell study drew worldwide media attention and helped turn Howarth and Ingraffea into rock stars in the anti-fracking movement. Time magazine named both as "People that Mattered" in 2011, along with anti-fracking activist/actor Mark Ruffalo.

The drilling industry's response was swift and multi-pronged.

Within days, the Clean Skies Foundation issued a rebuttal. The Moniz team quickly added an appendix to "The Future of Natural Gas" that took issue with several of the Cornell team's assumptions. But the MIT report did acknowledge the relevance of Howarth's main question, and it went so far as to recommend: "The Environmental Protection Agency and the U.S. Department of Energy should co-lead a new effort to review, and update as appropriate, the methane emission factors associated with natural gas production, transmission, storage and distribution."

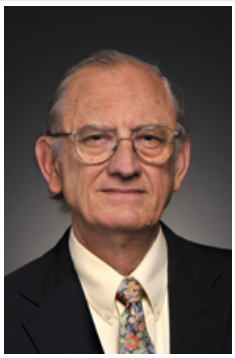
Meanwhile, energy industry groups pilloried Howarth and Ingraffea, accusing them of producing "garbage science" and worse.

Before long, a Google search of Howarth's name yielded — ahead any actual search results — a paid advertisement from the America's Natural Gas Alliance entitled "Howarth: A Credibility Gap." Its subtitle read: "Research on methane emissions from natural gas discredited by scientific community."

However, the latest studies based on actual measurements of methane leaks at specific gas drilling sites have tended to support — not discredit — Howarth's thesis.

For example, joint research by the National Oceanic and Atmospheric Administration and the University of Colorado at Boulder published in January measured unexpectedly high methane leakage from natural gas production sites in Colorado and Utah. Those results were far too narrow to prove the Howarth team correct, but they kept the door ajar on the fundamental question it had raised.

America's Natural Gas Alliance, the American Petroleum Institute and pro-industry flacks and academics had been working to slam that door shut by dismissing, even demeaning, the Howarth team's scholarship.


Henry D. Jacoby

Even Henry D. Jacoby, one of three co-chairs (with Moniz and Anthony J.M. Meggs) of MIT's "The Future of Natural Gas" report, told Nature.com in 2011 that the Cornell study was "very weak."

Howarth and Ingraffea fired back at MIT for relying so heavily on the Clean Skies Foundation and other energy industry players for funding their gas study and granting them seats on the study's advisory board.

Ingraffea told the DCBureau in January that the MIT report reminded him of the industry-funded advocacy that recently stained academic reputations at Penn State, UTexas and UBuffalo. MIT, like the other three, had touted gas industry talking points.

The Penn State report promoted shale gas as an economic dynamo and recommended against a state tax on drillers that is customary in other gas drilling states.

The UTexas report dismissed claims that fracking shale contaminates drinking water supplies.

The UBuffalo report concluded that shale gas drillers were getting more careful and efficient under the watchful eye of state regulators.

MIT's report touted shale gas as a huge economic opportunity and argued that switching to it for electric power generation in particular would help slow global warming.

Asked what differentiated the industry collaboration at MIT from the collaborations at the three schools that suffered "frackademia" PR hits, Ingraffea said, "They're doing the same thing."

Asked why MIT's reputation hasn't been similarly stained, he added: "Because they're MIT. MIT has the most prestigious reputation of any technical institution probably in the world. To accuse MIT of some sort of impropriety takes a lot of courage."

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Howarth added: "I received my Ph.D. from MIT and have a huge amount of respect still for the institution. However, their industry-funded work on natural gas has been extremely biased since the start. At best, it represents shoddy scholarship, but often comes closely to plain out advocacy for the industry standpoint. This has happened under Moniz's leadership, which should make him unacceptable for the Department of Energy position."

Meanwhile, critics of Howarth and Ingraffea have noted that their study was largely funded by the Park Foundation in Ithaca, N.Y., home of Cornell. Park funds various groups that have raised questions about fracking. DCBureau.org receives funding from the Park Foundation. Details on Park's spending are made public, while industry funding of academia typically is not. Few disclose as openly as MIT.

Partnerships with various industries are common in academia. It's become accepted practice to conduct research paid for by sources that have a stake in its conclusions. In an era of constrained government support, universities often solicit industry sponsorship for important research projects. Several industries have calculated that the investment is worth it: energy, pharmaceuticals, finance and tobacco, to name a few.

MIT officials declined to discuss on the record their partnership with the energy industry. But most observers agree that a legitimate argument can be made that a close working relationship is crucial to understanding the nuts and bolts of oil, gas, coal and nuclear. For example, obtaining the methane emission data from well sites that Howarth and Ingraffea call for — because they don't have it — requires some industry cooperation.


Kevin Connor

Kevin Connor, director of the Public Accountability Initiative in Buffalo, said universities need to properly "manage the conflicts" within academic-industry collaborations, and disclosure is an important first step.

"Disclosure is a piece of it, but beyond that it's a question of how these conflicts are managed" so they don't slide into pure industry advocacy, Connor said. "But it's hard to measure advocacy. It's not as simple as black and white."

If a university accepts industry funding and then slides into the role of blatant advocate, he added, "its name and its brand should suffer for it."

In the three recent "frackademic" scandals, critics disturbed by pro-industry advocacy dug deep to find disclosure issues to seal their case.

- A study that came out under Penn State's name in July 2009 painted a rosy financial picture of fracking but failed to disclose that it had been funded by an industry group. After it was uncovered and reported by outsiders, Penn State officials conceded in June 2010 that the failure to disclose was a "clear error."
- UBuffalo's May 2012 study, written for its brand new "Shale Institute" by the lead authors of the compromised Penn State study, concluded that gas drillers in Pennsylvania were making their operations safer. UBuffalo's president, Satish Tripathi, initially defended the Shale Institute and the study to SUNY trustees, but he reversed himself weeks later after UB faculty members and the PAI unearthed various industry ties. Tripathi shut down the Shale Institute in November 2012.
- UTexas yanked a February 2012 study that found no link between fracking and groundwater pollution after outsiders uncovered the fact that a key researcher, Chip Groat, had earned $58,000 a year as a board member of a gas drilling company, Plains Exploration & Production Co. Groat also held more than $1.7 million in Plains stock. The scandal led to the resignation of the head of UT's Energy Institute, Raymond Orbach in December 2012.

Whether MIT's "The Future of Natural Gas" crossed the line into advocacy may depend on the eye of the beholder. But its recommended policy positions harmonized with the goals of McClendon, the Chesapeake CEO who founded Clean Skies, the study's lead sponsor.

The study concluded that the environmental effects of fracking are "challenging but manageable." It advocated phasing out coal as a fuel for U.S. electric power generation and replacing it with natural gas because it's cheaper and produces less CO_2, a greenhouse gas that aggravates global warming. The study also urged steps to promote a domestic market for compressed natural gas vehicles and an international trading market for liquefied natural gas, or LNG.

Some of those goals clash with players in broader industry and environmental protection.

James Rogers, chairman and CEO of Duke Energy, has called natural gas "the crack cocaine" of electric power generation because of its wide price fluctuations. Power plants hooked on low-cost gas are particularly vulnerable to price spikes. In 2009 Rogers noted that the market price of gas had ranged from $3 per thousand cubic feet to $12 within only 18 months. Rogers said his company, which boasts market capital of $47 billion and serves 7.1 million customers, preferred to balance the use of gas with coal and nuclear.

Meanwhile, alarm over groundwater contamination and other potential environmental dangers of fracking led the Sierra Club to reverse its support for gas as a "bridge fuel" to a renewable energy future. The Club once accepted (and spent) $26 million from Chesapeake Energy for its "Beyond Coal" program. In 2012 it turned down the gas driller's offer of $30 million more.

Both the Sierra Club and prominent industrialists are wary of promoting a world market for LNG, especially if it means granting more than a dozen permit applications to export LNG from U.S.

terminals. The MIT report doesn't explicitly advocate LNG exports, but U.S. chemical and manufacturing industries are alert to the threat. "If we allow the world gas price to come to this country by exporting gas then it will destroy the benefits of plentiful cheap gas," said Andrew Liveris, CEO of Dow Chemical.

James Rogers

On the global warming front, the Moniz team stressed the benefits of natural gas over coal because burning gas produces less CO2, the leading greenhouse gas. It treated methane as a side issue.

But methane's effect as a greenhouse gas has been found to be 25-33 times greater than CO2's over a 100-year time frame and 70-105 times greater over a 20-year time frame. The difference is due to the fact that CO2's effects linger far longer than methane's. Howarth asserted that over a 20-year time frame, methane emissions from natural gas systems represent 44 percent of greenhouse gas effects attributable to man (and 17 percent of total GHG effects).

MIT scientists have said they favor the more conventional 100-year time frame, where methane's effect is less noteworthy.

Howarth's study included both time frames for comparison purposes, but it stressed the effects under the 20-year perspective. "The need for controlling methane is simply too urgent, if society is to avoid tipping points in the planetary climate system," he said.

Sergey Paltsev

The Cornell team estimated the total methane emissions during the life cycle of a shale gas well at between 3.6 percent and 7.85 percent of the well's total production.

MIT scientists took aim at their assumptions and conclusions shortly after the Cornell study was released. They took up the case again in November 2012 with a peer-reviewed study by Francis O'Sullivan and Sergey Paltsev, two members of the Moniz team that had written "The Future of Gas Drilling" 17 months earlier.

An MITEI press release on the new study declared that methane leaks from gas drilling operations had been "largely exaggerated," based on data from 4,000 wells in five different shale regions. They questioned the Cornell team's assumption that all methane leaks from a well pad vented into the atmosphere. They said their review of records at thousands of wells showed that drillers were recapturing 70 percent of all methane that leaked, while 15 percent was flared and only 15 percent was vented.

The Cornell study had cited an EPA finding that "85 percent of flowback gas from unconventional wells is vented and less than 15 percent is flared." Yet the Howarth team inexplicably assumed that all methane leaks from well pads were vented.

Asked to explain, Howarth said in a Feb. 17 email: "We assumed all venting based on off-the-record communications from industry insiders. In retrospect, I agree that there must be at least some flaring. And of course the situation has changed since last October, when the EPA prohibited much of the venting."

Ingraffea questioned the scientific validity of the O'Sullivan/Paltsev data, given that it was provided to the MIT team by gas drillers who have an incentive to under-report venting. Paltsev did not return phone calls or answer emails to discuss the findings, and O'Sullivan declined to speak for the record. MIT officials declined to arrange an interview with Moniz.

Only a handful of recent methane emission studies have been based on new independent scientific measurements. One of those, a February 2012 study of an oil and gas operation north of Denver by a team led by Gabrielle Petron of the University of Colorado, Boulder, estimated gas leaks from production at 4 percent — within the Cornell team's estimated range of 3.6-7.85 percent. Another, the NOAA/UC Boulder study published in January, measured methane emissions at two locations: the Denver-Julesberg Basin in Colorado and the Uinta Basin in Utah. It reported 4 percent at the Colorado site and 9 percent at the Utah site. NOAA is continuing its measurements, not only at the well pad but at the transmission, storage and distribution phases of the gas cycle.

Francis O'Sullivan

Meanwhile, the Environmental Defense Fund has joined forces with several universities, including UTexas and Duke University, and several gas drilling companies, including BP, Shell and Exxon Mobil, to systematically measure methane venting throughout the gas life cycle.

EDF has calculated that methane venting of 3.2 percent represents a crucial threshold. Beyond that, it found, the new combined cycle gas power plants no longer provide greenhouse gas benefits over new coal plants. And at current methane leakage rate estimates, EDF found, converting heavy duty diesel vehicles to natural gas would cause nearly 300 years of climate damage before any benefits were achieved.

The EDF project draws on $6 million in funding from New York City Mayor Michael Bloomberg's charitable foundation. Bloomberg has already contributed many millions of dollars to the Sierra Club's "Beyond Coal" campaign, though he has not followed the Club's about-face on fracking.

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Just the opposite. Last August, Bloomberg wrote an opinion article in The Washington Post with fracking innovator George Mitchell that called the fracking of shale formations "the most significant development in the U.S. energy sector in generations." He cited multiple economic benefits and noted that replacing dirty coal plants with gas-powered plants had helped cut CO2 emissions from U.S. electricity producers to the lowest level in two decades. And he wrote that fracking's environmental side-effects could be managed with "strong and reasonable state regulation."

The results of the EDF project shouldn't be considered the final word, Ingraffea said, especially given the Bloomberg funding and industry's whole-hearted participation. He reiterated the call he and Howarth made in 2011 for other independent scientists to measure actual methane emissions — at every phase of the gas life cycle. An ongoing study of leaks in Boston's decrepit gas pipeline network is a start, he said.

"The study that EDF, the industry operators and universities are engaged should have been done years ago," he added. "It's now being done after most states and [the] federal government have declared that shale gas is a really good thing to do. [What if the results] show from a climate change point of view this is not a really good thing to do?

"Will EDF stand up and say, 'We shouldn't be doing this; it's really bad for climate,' knowing full well that their partners are the most prestigious operators? It will be really hard."

Peter Mantius

Peter Mantius is a reporter in New York. He covered business, law and politics at *The Atlanta Constitution* from 1983-2000. He has also served as the editor of business weeklies in Hartford, CT, and Long Island. He is the author of *Shell Game* (St. Martin's Press 1995), a nonfiction book on Saddam Hussein's secret use of a bank office in Atlanta to finance billions of dollars in arms purchases from Western countries before the 1991 Persian Gulf War.

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