



ISSUE BRIEF

DECEMBER 2013

PUBLICPOLICY.WHARTON.UPENN.EDU

VOLUME 1, NUMBER 12

THE MILITARY-ENVIRONMENTAL COMPLEX ¹

SARAH E. LIGHT

The U.S. military and its mission to enhance and defend national security often are perceived to be at odds with environmental protection and sustainability.

Indeed, when it comes to energy use, the Department of Defense (DoD) is the single largest consumer of energy in the nation, as well as the single largest emitter of greenhouse gases. The military's total energy costs in fiscal year 2011 were \$19.3 billion: \$4.1 billion to power its facilities, and \$15.2 billion for operational energy expenses related to military combat operations. The DoD is the nation's largest landlord; it manages more than 500 installations in the United States and overseas, covering approximately 2.3 billion square feet of building space. The DoD also manages approximately 28 million acres of land in the United States. This physical footprint translates into an enormous carbon footprint. Spanning its vast and varied facilities and global operations on land, air, and sea, the military's energy needs are both deep and broad.² Despite the significant impact that its energy needs have on the environment, the military's opera-

tions are largely exempt from environmental laws and regulations when those laws conflict with the military's national security mission.

Yet in reality, the military's mission of ensuring national security is deeply intertwined with the need to reduce energy use and develop alternative and renewable fuel sources. While the military is not likely to become the environment's greatest advocate overnight, it has important incentives to reduce its reliance on fossil fuels and combat climate change. Fuel convoys supporting combat missions are under constant threat. From 2003 to 2007 in Iraq and Afghanistan, more than 3,000 Army personnel and contractors were wounded or killed in action as a result of attacks on fuel and water resupply convoys. Reducing the military's reliance on petroleum and developing alternative energy sources such as solar power therefore could help save lives. Likewise, the mission

ABOUT THE AUTHOR

Sarah E. Light, JD

Assistant Professor of Legal Studies and Business Ethics, The Wharton School

Sarah E. Light is an Assistant Professor of Legal Studies and Business Ethics at the Wharton School of the University of Pennsylvania, where she teaches Environmental Management, Law and Policy, as well as Negotiation.

Previously, she served for ten years as an Assistant United States Attorney for the Southern District of New York, Civil Division, and for four years as the Chief of the Office's Environmental Protection Unit. In that capacity, she represented federal agencies, including the Environmental Protection Agency, the Department of Defense, the U.S. Army Corps of Engineers, and others in affirmative and defensive environmental litigation.

Professor Light previously has taught Environmental Management, Law and Policy at the Earth Institute at Columbia University, and served as a *pro bono* mediator in the United States District Court for the Southern District of New York. Her scholarly articles have appeared in the *Yale Law Journal*, the *Tulane Law Review*, and forthcoming works will be published in the *U.C.L.A. Law Review* and the *Boston College Law Review*. Professor Light earned her J.D. from Yale Law School, an M. Phil in Politics from Oxford University where she was a Rhodes Scholar, and an A.B. in Social Studies *magna cum laude* from Harvard College.

of national security drives the military to ensure that its installations and facilities are protected from disruptions to the electric grid—not just from possible cyber-attack, but from climate-change related natural disasters. The military also recognizes that climate change is likely to carry significant and destabilizing geopolitical impacts, contributing to poverty and food and water scarcity, and thereby increasing the likelihood of armed confrontations between nations over access to resources. That the Russian Navy is now patrolling shipping lanes in the Arctic Ocean newly opened from melting ice only underscores the impact of climate change on potential areas of conflict. Consequently, while the law suggests that the military may disregard environmental laws if they conflict with its national security mission, the military has political and economic incentives that prompt it to do more than the law requires in the area of sustainable energy use.

The exceptional alignment between the military mission and the need to conserve energy, address climate change, and develop renewables, brings equally exceptional potential: for stimulating the development of new technologies, providing large-scale commercial support for existing technologies, and helping to drive behavioral changes on a grand scale. Policymakers need to think carefully about how to harness this alignment, and how cooperation between the military and the private sector can advance these ends. If nurtured properly, the military's extensive undertaking to improve its sustainable energy use and reduce demand for fossil-fuel-derived energy both on the battlefield and in permanent installations, in which the military's interests are intertwined with those of Congress, the President, and the private sector—what I call the Military-Environmental Complex—has the potential to become one important tool in the regulatory toolkit to combat climate change.

Military stimulation of technologi-

cal development during has deep roots. At its height during the twentieth century, military needs played a major role in driving the development of new technologies such as semiconductors, the global positioning system, the Internet, and computers that not only transformed war fighting, but the civilian realm as well. Both military-driven innovation (R&D) and procurement from the private sector drove this innovation. As a first user of new environmental technologies, the military not only can help evaluate their effectiveness, but by its very size creates a needed market to simulate innovation, as it has done in the past with aircraft, electronics, and the internet. The mere fact that a project supports military interests—rather than general commercial interests—may drive support among other institutional players who may feel more strongly connected to the value of protecting national security than other values such as energy independence or environmental protection. Moreover, the DoD's exceptional hierarchical nature allows its leadership to consider the importance of changing norms and behavior in ways that might be unthinkable in the private sector. In the long run, the Military-Environmental Complex and the relationships it both builds upon and engenders between the military and the private sector could have important consequences not only for the development and commercialization of clean energy technologies that have widespread civilian applications, but also for the diffusion of environmental practices into the broader population.

At the same time, it is important to be cautious in relying upon this exceptional alignment between the military's mission and society's needs to develop clean energy technology. As historical lessons from the military-industrial complex demonstrate, there is the potential for rent-seeking behavior by elected representatives, private firms and industry that must be addressed.

This brief examines the governmental and corporate actors—and the public-private

partnerships between them—that propel the Military-Environmental Complex, pointing out its enormous potential benefits and well as the possible pitfalls, and concludes with recommendations for further research and future policymaking.

GOVERNMENT INSTITUTIONS DRIVING THE MILITARY-ENVIRONMENTAL COMPLEX

While the potential of the Military-Environmental Complex has yet to be fully tapped, Congress and the White House, as well as the DoD itself, already have been taking steps to encourage its development—despite the exemptions that are given to the military under environmental and administrative law.

In addition to Congressional mandates that instruct all federal agencies to promote energy conservation, efficiency, and renewable sourcing, Congress has directed the DoD specifically to reduce energy demand and develop alternative renewable energy sources, primarily in its facilities. For example, Congress has required that by fiscal year 2025, the DoD produce or procure at least 25 percent of the energy it consumes within its facilities from renewable energy sources. Congress also has directed the DoD to consider using solar or other forms of renewable energy for facilities construction projects (including housing), to use energy-efficient (Energy Star/FEMP) products in such housing, and to prefer energy-efficient equipment generally. Congress has mandated too that the DoD prefer hybrid, electric or plug-in vehicles that are of reasonable cost and meet Departmental needs.³

Congress has provided additional financial incentives for the DoD to meet these goals. The DoD is authorized to reinvest half of its energy cost savings into additional conservation measures, and half into location-specific improvements for service members. Congress also permits the DoD to sell to a utility company the electricity it

¹ This brief is excerpted from a larger article that will appear in the May 2014 issue of the Boston College Law Review. The Penn Wharton Public Policy Initiative is grateful to the editors of the Boston College Law Review for permission to use this material. A working version of the article also is available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2332195. For fuller citations, please

refer to the working paper or the article.

² Environmental and Energy Study Institute, Fact Sheet: DoD's Energy Efficiency and Renewable Energy Initiatives (July 2011); Department of Defense Annual Energy Management Report for Fiscal Year 2011, 1 & n.2, 14 (Sept. 2012), <http://www.acq.osd.mil/ie/energy/library/FY.2011.AEMR.PDF>; Press Release, U.S. Dep't of

Interior, Interior and Defense Departments Join Forces to Promote Renewable Energy on Federal Lands (Aug. 6, 2012), available at <http://www.defense.gov/releases/release.aspx?releaseid=15498>.

³ 10 U.S.C. § 2911(e); 10 U.S.C. § 2915; 10 U.S.C. § 2922b; 10 U.S.C. § 2922f; 10 U.S.C. § 2922g (the preference for hybrid, electric or plug-in vehicles does not

apply to "tactical vehicles designed for use in combat.").

⁴ 10 U.S.C. §§ 2911, 2912, 2916, 2922a.

⁵ Federal Leadership in Environmental, Energy, and Economic Performance, Exec. Order 13514, Section 1, 74 Fed. Reg. 52117, 52117 (Oct. 5, 2009).

⁶ Strengthening Federal Environmental, Energy, and Transportation Management, Exec. Order 13423, 72 Fed. Reg.

produces from alternative or cogeneration facilities under the DoD's jurisdiction, and to credit any proceeds to the appropriation account for the supply of electricity. Perhaps most importantly, the DoD can enter into 30-year Power Purchase Agreements with private developers to promote the development of alternative energy generation on military lands. These contracts stimulate the generation of alternative and renewable energy sources with significant private investment. Private developers build and own the generation equipment, while the military enters into long-term contracts to purchase the electricity produced, thus guaranteeing stable demand for a sufficient time period for the private financiers to recoup their investment. The DoD is unique among federal agencies in this ability to enter into such long-term agreements.⁴

The White House likewise has directed all federal agencies, including the DoD, to improve their energy profile so as to lead the nation by example. Executive orders issued by President George W. Bush and President Barak Obama have set goals for the use of renewable energy and directed agencies to establish targets for reductions in greenhouse gas emissions and water consumption. For example, in 2009, President Obama signed Executive Order 13,514, which requires all Federal government agencies to disclose greenhouse gas emissions information annually from their direct and indirect activities. The Order also directs each agency to propose to the White House agency-wide greenhouse gas reduction targets to reach by 2020 as compared to a 2008 baseline.⁵ Executive Order 13,423, signed by President Bush in 2007, similarly directed Federal agencies to improve energy efficiency and reduce greenhouse gas emissions and water consumption, to require acquisition of sustainable goods, and mandates sustainable federal vehicle fleets.⁶ That Executive Order also built on the Energy Policy Act of 2005's requirement that federal agencies consume certain

set percentages of energy from renewable sources by requiring that at least half of the renewable energy come from "new" renewable sources, defined as "sources of renewable energy placed into service after January 1, 1999."⁷

It is important to note that these Congressional mandates and executive orders contain numerous exemptions related to national security and military activities, and thus apply only to the DoD's use of energy for its facilities, not for its operations (which account for approximately 75 percent of the DoD's energy use).⁸ To target operations, Congress instead directed that the DoD create a new Office of Operational Energy

“The DoD’s actions not only acknowledge the validity of climate change; they recognize it, along with fossil fuel use, as a threat to the military’s core mission and a drain on its operations.”

Plans and Programs, headed by an Assistant Secretary of Defense, to focus the DoD's attention on reducing operational energy use as well.

Beyond any legal mandates, however, the DoD itself has been launching initiatives to reduce and become more efficient in its energy use, to change behavior with respect to energy consumption, and to stimulate innovation and the development of clean technology not only in its facilities, but in its military operations as well. This internal motivation has largely come from field commanders who have asked the DoD to “unleash us from the tether of fuel” to improve operational capacity and reduce combat deaths.⁹ Again, this speaks to the military's internal incentives to

reduce energy demand, increase efficiency and explore alternative sources of fuel—in particular, so that fewer lives will be lost guarding extensive, petroleum-intensive fuel convoys on the ground, and to increase the military's capabilities.

The DoD's actions not only acknowledge the validity of climate change; they recognize it, along with fossil fuel use, as a threat to the military's core mission and a drain on its operations. The solution, from the DoD's perspective, is to reduce demand for energy, to increase energy efficiency, and to use renewable fuels that do not require the same long “tail” to bring to the theater of war. Energy efficiency and reduced use in this way can enhance the functioning and force of the military. Missions can go father without refueling, running generators, or bringing fuel convoys to the battlefield.

A focus on governmental institutional drivers should not obscure the significant role that the private sector plays in driving the Military-Environmental Complex, both as a source of technological innovation and a source of funding.

COLLABORATION WITH THE PRIVATE SECTOR

The Military-Environmental Complex is characterized by a deep level of interconnectedness between the military and the private sector.

First, the DoD, at times in cooperation with other agencies, is providing funding to private sector firms to finance the development of new renewable energy technologies that ultimately may have civilian spinoff potential in the energy sector. Government funding is virtually essential for developing and commercializing these new technologies, which currently are more expensive per kilowatt/hour than conventional petroleum and fossil-fuel based energy, in the absence of a carbon tax on externalities or other equivalent regulation. For example, under the auspices of programs authorized by Congress

³ 3913 (Jan. 26, 2007).

⁴ 42 U.S.C. § 15852.

⁵ DoD, Energy for the Warfighter: Operational Energy Strategy (June 14, 2011), available at http://energy.defense.gov/OES_report_to_congress.pdf, at 3.

⁶ Defense Science Board, Report of the Defense Science Board Task Force on DoD Energy Strategy: More Fight –

Less Fuel (Feb. 2008), available at <http://www.acq.osd.mil/dsb/reports/ADA477619.pdf> (quoting James Mattis, former Marine Corps Commanding General, 1st Marine Division, Operation Iraqi Freedom).

¹⁰ [http://www.serdp.org/News-and-Events/News-Announcements/Program-News/New-installation-energy-and-water-technology-demonstrations-announced-for-](http://www.serdp.org/News-and-Events/News-Announcements/Program-News/New-installation-energy-and-water-technology-demonstrations-announced-for)

<http://www.serdp.org/Featured-Initiatives/Installation-Energy>.

¹¹ http://www1.eere.energy.gov/femp/financing/super-espcs_hill_afb.html; http://armyeitf.com/index.php/component/content/article/67-news/procurement/15-detrick-noi?utm_source=NewsAlert&utm_medium=email&utm_term=DetrickNOI&utm_

<http://www.armyeitf.com/index.php/opportunities/procurementactions>; Notes of Interview with John Lushetsky, April 12, 2013 (notes on file with author).

¹² http://www1.eere.energy.gov/femp/pdfs/escp_ss_dyess.pdf; http://www1.eere.energy.gov/femp/pdfs/escp_ss_pendleton.pdf; <http://www.amerienerygroup.com>.

and the DoD in the 1990s, the DoD in 2009 launched its Installation Energy Test Bed Initiative, which annually awards funding on a competitive basis to projects submitted by private firms, universities, national laboratories, and other organizations, involving the management of installation (facility) energy. Recent projects funded in 2013 included: a battery energy storage system and microgrid control system, a data-center liquid-cooling system, high-concentration photovoltaics, a waste gasification system, technology that can reduce air-conditioner energy use through measuring operational energy efficiency, and a roof asset management system. Smart microgrids, which have the ability to reduce cost, increase the use of renewables, and offer energy security, have been a particular emphasis of the Test Bed Initiative.¹⁰

DoD support for research and development of new technologies by private firms is nothing new; this is a role that the military has played, with much success, for many decades already. The DoD's resources can make it possible for companies to explore experimental and expensive alternative energy technologies that venture capital firms and banks would be reluctant or unable to fund. And if such new energy technologies and sustainable methods are a social good, this demand for DoD financial and demand support may be of great social benefit.

On the flip side of the private sector's demand for government financing lies the DoD's active quest for private financing as it seeks energy security for its facilities. Under its so-called "enhanced use lease" authority, the DoD can lease property from its portfolio to private firms for large-scale renewable energy generation projects. As noted above, the DoD also has unique statutory authority among federal agencies to enter into Power Purchase Agreements (PPAs) of up to 30 years for the provision and operation of energy production facilities and the purchase of energy produced at these facilities. The DoD is taking advantage of these special allowances in the Army's Energy Initiatives

Task Force (EITF) program, created by the Army in 2011. In keeping with Congress's mandate that the DoD produce or procure at least 25 percent of its energy on installations from renewable sources by 2025, the EITF is facilitating the development of privately-financed renewable energy generation facilities on Army installations, including solar, wind, biomass and geothermal in order to promote energy security.¹¹

The DoD also has the statutory authority to enter into Energy Savings Performance Contracts (ESPCs). These are partnerships with private energy service companies, which take responsibility for designing, financing, installing, and maintaining energy saving equipment for a client. The private firm receives compensation based on the realization of a guaranteed stream of future savings, and excess savings then accrue to the federal government. Likewise, the DoD can become part of Utility Energy Service Contracts (UESCs), by which an agency enters into a contract with a utility that agrees to pay certain capital costs upfront to implement selected energy conservation measures.

The DoD already has entered into several of these types of arrangements. For example, the Air Force entered into an ESPC at Dyess Air Force Base in Texas, through which it now procures 100% of its energy through wind power. At Marine Corps Base Camp Pendleton, using both ESPCs and UESCs, the Marines achieved a 44% reduction in energy use despite an increase in the footprint of its facility of two million square feet. Energy retrofits included decommissioning a steam plant, incorporating photovoltaic arrays, changing fixtures and using daylighting technology.¹²

POTENTIAL CONCERNS: LESSONS FROM THE MILITARY-INDUSTRIAL COMPLEX

Despite the positive impact they may have on the environment and the climate, these

close ties between the private sector and the DoD, which help drive the Military-Environmental Complex, also can be a potential source of concern. Indeed, the military-industrial complex, out of which some of these relationships in the clean energy arena have grown, has largely pejorative connotations. Provisions in the annual DoD budget authorizations between 2008-2013 suggest that some members of Congress have inserted requirements to benefit specific firms, voter constituencies, and domestic industries. For example, there are Congressional directives that encourage the DoD to pursue alternative energy sources derived specifically from coal—despite the fact that coal-based fuel sources are unlikely to avoid some of the difficulties that surround other fossil fuels in operations. Similarly, Congressional mandates, restrict the DoD's ability to use appropriated funds to obtain Leadership in Energy and Environmental Design (LEED) gold or platinum certification, apparently out of concern for the U.S. timber industry, which is not privileged over foreign sources in LEED's scoring system. As these details suggest, it is possible that the military's interest in sustainable energy could be diverted to the creation of "pork" projects that fail to serve the DoD's mission to enhance national security and increase military capabilities.¹³

Similarly, many of the companies that are set to work with the DoD on alternative energy projects are the same top-100 military contractors (determined by dollar value of contracts) that have for years been part of the so-called military-industrial complex. These partners include Lockheed Martin, the Boeing Corporation, Raytheon Integrated Defense Systems, United Technologies Research Center, and Honeywell International, Inc. So some caution may be warranted to ensure that such contracts are truly in the public interest, not merely the pecuniary interest of the firms.

Finally, some historical examples from the military-industrial complex in the 20th

[com/index.php/en/daylighting-technology; http://www1.eere.energy.gov/femp/financing/superespcs_hill_atf.html](http://www1.eere.energy.gov/femp/financing/superespcs_hill_atf.html).

Defense Authorization Act for Fiscal Year 2009, §334(a); 10 U.S.C. § 2918; 10 U.S.C. § 2922(d).

¹³ See, e.g., <http://urbanland.uli.org/Articles/2012/Feb/SpivakLEED>; <http://www.federaltimes.com/article/20120107/FACILITIES02/201070302/Industry-objects-green-gov-standards>. Duncan Hunter National

century suggest that a “dual use” strategy – promoting the interests of both the military and society simultaneously – raise concerns when the military is setting technological specifications. It may reduce the potential for civilian “spillover” if technologies are built more closely to military specifications, rather than to those that would benefit society as a whole. It also raises the risk that the military will, in order to obtain a comparative advantage internationally, want to hold promising technologies close to the vest, rather than to promote technology diffusion.

On the flip side, the relationship between the military and the private sector in this regard may have positive spillover effects. It may be that the Military-Environmental Complex has the potential to influence some of these industrial giants to turn more “green.” If their profit motive dovetails with the military’s desire to reduce energy consumption and promote renewables, then this alignment may have the potential to change the way large private firms and government contractors think and behave about energy use. It may compel them to reconsider the war motive as the sole driver of military contracts, and replace it (or at least supplement it) with a sustainability motive.

POLICY IMPLICATIONS

The military is currently one of the most important domestic players in the development and adoption of new and existing technologies to reduce energy use and promote renewables. It is crucial to get this story right because it allows policymakers to recognize that there are potentially substantial benefits for the environment to the large-scale investments made in sustainable practices and technologies by the U.S. military. What the Military-Environmental Complex demonstrates is that a combination of approaches – directive, informational, behavioral, and self-initiated – are likely to provide the best opportunity to address climate change at a global level.

The dramatic scale at which the Military-Environmental Complex potentially can address environmental problems therefore should command greater attention from scholars and policymakers going forward. Specifically, it is important for scholars and policymakers to consider how to promote policies that unleash the positive potential of the Military-Environmental Complex—that both protect national security and the environment—while at the same time avoiding the potential dangers and shortcomings, in particular interest-group politics and rent-seeking by private firms.

First, the President and Congress should expand the financial incentives that encourage the military to reduce demand and invest in renewables, and increase or expand the mandatory renewable portfolio requirements of 25 gigawatts by 2025 well beyond 2025. This will ensure that all players—both within the DoD and the private sector—understand that these investments in renewables are long-term investments. To the extent that Congress can incorporate additional incentives for private firms to continue to finance major renewables generation projects, whether through the tax code or other legislative means, this could also save taxpayer dollars in the long run.

Second, Congress should extend the ability to use 30-year Power Purchase Agreements to agencies beyond the DoD—most importantly, to the General Services Administration, which purchases energy on behalf of other agencies. The potential to harness private financing for large-scale renewable projects should not be limited to the DoD when other agencies own and manage land that can also be put to use generating renewable sources of energy.

Third, successful dissemination of technological innovation beyond government agencies also requires openness, rather than secrecy. Thus, to the extent that the military is driving innovation, policymakers should make sure that the policy and legal landscape promote diffusion regarding technolo-

gies that can reduce conventional energy demand and develop renewables, rather than holding such technology close to the vest in the name of national security. Given the military’s role as a validator of climate science, and its recognition that climate change has the potential to increase violent conflict in the world, diffusion is likely to be in the military’s interests in this context. In this vein, the DoD and the private sector should create more platforms for sharing best practices, experience with new technology, and information regarding potential opportunities for private firms to invest in innovation. As centers of innovation both in technology and ideas, universities are ideally situated to serve as mediators in this important dialogue.

Fourth, it is important to guard against “pork projects” and improper manipulation of the military’s interest in energy conservation and sustainability for private gain. More empirical research is warranted as to whether and in what circumstances there may be “undue influence” as opposed to normal political lobbying activity, and whether any more must be done than the protections already afforded by such laws as the Lobbying Disclosure Act of 1995, the Honest Leadership and Open Government Act of 2007, and the False Claims Act to prevent rent-seeking and fraud. Such research might include, for example, determining which interest groups are contacting members of Congress and the military to seek support for particular projects, whether firms receiving funds or contracts are established military contractors or new entrants to the market, which geographic areas of the country stand to benefit from these clean energy projects, whether those projects are in the interest of national security and reducing climate change-related risks or are trying to promote values other than the DoD’s core mission, and what impact such contacts have as to whether particular projects are funded.

Despite the need for further research and continued caution, the Military-

Environmental Complex has already gone a long way to encouraging a crucial dialogue between government and the private sector, and among government institutions, about the goals of sustainability. With proper oversight and encouragement, the Military-Environmental Complex may secure its place within the regulatory toolkit as a way to foster energy sustainability in the long term.

BRIEF IN BRIEF

- Although the military's operations are largely exempt from environmental laws and regulations when those laws conflict with its national security mission, the military has important incentives to reduce its reliance on fossil fuels and combat climate change.
- If nurtured properly, the military's extensive undertaking to improve its sustainable energy use and reduce demand for fossil-fuel-derived energy has the potential to become one important tool in the environmental regulatory toolkit.
- To help this tool reach its potential, policy changes are warranted to expand financial incentives, extend the benefits of special private financing arrangements, promote the open dissemination of technological innovations, and guard against "pork projects" in the energy sphere.

Founded in 1881 as the first collegiate business school, the Wharton School of the University of Pennsylvania is recognized globally for intellectual leadership and ongoing innovation across every major discipline of business education. With a broad global community and one of the most published business school faculties, Wharton creates economic and social value around the world.

////////////////////////////////////
KNOWLEDGE FOR POLICY IMPACT
////////////////////////////////////

ABOUT THE PENN WHARTON PUBLIC POLICY INITIATIVE

The Penn Wharton Public Policy Initiative (PPI) is a hub for research and education, engaging faculty and students across University of Pennsylvania and reaching government decision-makers through independent, practical, timely, and nonpartisan policy briefs. With offices both at Penn and in Washington, DC, the initiative provides comprehensive research, coverage, and analysis, anticipating key policy issues on the horizon. Penn Wharton PPI is led by Faculty Director Mark Duggan, the Rowan Family Foundation Professor and Chair of Business Economics and Public Policy, and Professor of Health Care Management at Wharton.

ABOUT PENN WHARTON PPI ISSUE BRIEFS

Penn Wharton PPI publishes issue briefs at least once a month, tackling issues that are varied but share one common thread: they are central to the economic health of the nation and the American people. These Issue Briefs are nonpartisan, knowledge-driven documents written by Wharton and Penn faculty in their specific areas of expertise.

For additional copies, please visit the Penn Wharton PPI website at publicpolicy.wharton.upenn.edu.

 Follow us on Twitter: @PennWhartonPPI