

**THE UNCONVENTIONAL GAS TECHNICAL
ENGAGEMENT PROGRAM: HOW TO ENSURE THE
UNITED STATES SHARES ITS EXPERIENCE IN A
SOCIALY AND ENVIRONMENTALLY
RESPONSIBLE MANNER**

*Gina Tincher**

Unconventional shale gas has “dramatically changed the energy landscape in the United States, and there is no reason to think that the United States is the only place where this resource can be developed safely and responsibly.”¹

I.	Introduction	114
II.	The New American Revolution	117
	A. Advancements in Technology.....	117
	B. Reasons for Expanded Development of Unconventional Gas	118
	C. Potential for Unconventional Shale Gas Outside of the United States.....	119
III.	The Unconventional Gas Technical Engagement Program (UGTEP)	120
	A. The U.S. State Department and Its Role in Global Energy Issues.....	120
	B. An Overview of UGTEP.....	120
	C. Participating Nations, Their Unique Motivations, and Challenges.....	122
	1. Ukraine.....	124
	2. Poland.....	126
	3. China	127
	4. India	129
IV.	Informal Mechanisms for Ensuring Responsible Administration of UGTEP.....	130
	A. Technology Transfer and the United States’ Role in Global Expansion of Unconventional Gas Development	131
	B. Why Seeking a Social License is a Good Ethical—and Economic—Policy	134
V.	Applying a NEPA-Like Analysis to Ensure Responsible Administration of UGTEP	137
	A. Does NEPA Apply to UGTEP-Related Projects Outside of the United States?	137

* Gina Tincher, J.D. May 2015, University of Denver Sturm College of Law. Before law school, Gina spent nearly fourteen years as a law enforcement officer. Gina would like to thank Professor Justin Pidot for the guidance and feedback that took this from an abstract idea to finished product and Professor Richard Lazarus for his input, suggestions, and reminder that the writing process does not have to be overwhelming.

1. Robert F. Cekuta, Prin. Deputy Assistant Sec’y, U.S. Dep’t of State, Bureau of Energy Res., Remarks at Latin America Summit of the World Shale Series (Sept. 5, 2013).

B. The Benefits of Requiring a Co-Authored NEPA-Like Analysis	138
VII. Conclusion	139

I. INTRODUCTION

The Shale Gas Revolution has arrived. Since 2005, the production of natural gas in the United States has increased nearly twice as fast as consumption.² As a result, net imports of natural gas fell 58% between 2005 and 2012.³ Projects originally intended as natural gas import pipelines are now being proposed as liquefied natural gas (LNG) export pipelines.⁴ The combination of horizontal drilling and hydraulic fracturing (fracking) has transformed the United States from a net importer of natural gas to a country that is set to become a net exporter by 2015—a giant step towards energy independence that many previously believed the United States would never achieve.⁵ Energy independence and security are two of the most important reasons why some nations have begun exploring the possibility of developing their own unconventional shale gas resources.

While some foreign nations have eyed the U.S. experience with envy and a desire to replicate that experience in their own country, others have viewed this with cautious skepticism.⁶ Some countries, including France, Germany, and Bulgaria, have banned hydraulic fracturing entirely.⁷ Britain, Romania, and the Netherlands have lifted, or are contemplating lifting, previously enacted bans on the process.⁸

Fracking supporters in many European nations dependent on natural gas from Russia cite shale gas as a path to enhancing their energy security.⁹ The recent events in Ukraine have underscored this point. Most of Ukraine's shale gas reserves lie in the eastern and southern portions of the State.¹⁰ At the end of 2014, Crimea claimed independence from Ukraine in an election many believed to have been heavily manipulated by Russia—an election not recognized by Ukraine. It remains to be seen what effect western sanctions, plummeting oil prices, and U.S. threats to arm pro-Ukrainian fighters will have on Russia and President Putin's

2. U.S. Energy Info. Admin., *U.S. Boosts Natural Gas Output and Use Since 2005, While OECD Europe Scales Back*, U.S. DEP'T OF ENERGY (Jan. 14, 2014), <http://www.eia.gov/todayinenergy/detail.cfm?id=14591>.

3. *Id.*

4. See, e.g., Jonathan Thompson, *A Pipeline Built Years Ago May Start to Export Rocky Mountain Gas to Asia*, HIGH COUNTRY NEWS (Apr. 14, 2014), <http://www.hcn.org/blogs/goat/how-a-little-noticed-pipeline-might-make-natural-gas-exports-possible>.

5. Coral Davenport & Steven Erlanger, *U.S. Hopes Boom in Natural Gas Can Curb Putin*, N.Y. TIMES (Mar. 5, 2014), <http://www.nytimes.com/2014/03/06/world/europe/us-seeks-to-reduce-ukraines-reliance-on-russia-for-natural-gas.html>.

6. Christopher Werth, *Seeking Energy Independence, Europe Faces Heated Fracking Debate*, NPR (Mar. 7, 2014), <http://www.npr.org/blogs/parallels/2014/03/07/286816548/seeking-energy-independence-europe-faces-heated-fracking-debate>.

7. *Id.* See also Justin Scheck & Selina Williams, *Oil Giants Abandon Shale Plays Outside U.S.*, WALL ST. J., Mar. 19, 2015, at B1.

8. Kate Galbraith, *Some in Europe Are Rethinking Opposition to Fracking*, N.Y. TIMES (May 29, 2013), <http://www.nytimes.com/2013/05/30/business/energy-environment/30iht-green30.html>.

9. *Id.*

10. *Map of the Wells and Areas*, UNCONVENTIONAL GAS IN UKRAINE (Jan. 21, 2015), <http://shalegas.in.ua/en/karta/>.

propensity to use gas supplies as a political weapon. Speaking at the U.S.-E.U. Energy Council Meeting in April 2014, Secretary of State John Kerry summarized the concern over Russia's manipulation of gas supplies:

It really boils down to this: No nation should use energy to stymie a people's aspirations. It should not be used as a weapon. It's in the interest of all of us to be able to have adequate energy supplies critical to our economies, critical to our security, critical to the prosperity of our people. And we can't allow it to be used as a political weapon or as an instrument for aggression.¹¹

"By some accounts, it is this struggle [for Ukraine's oil and natural gas] that is as much to blame for the current crisis as any geopolitical tug-of-war between East and West."¹²

In 2010, the United States began a program whereby foreign nations could learn from government regulatory experts and private representatives of the oil and gas industry. The Global Shale Gas Initiative (GSGI), later renamed the Unconventional Gas Technical Engagement Program (UGTEP), held its first conference in August of 2010.¹³ Over fifty representatives from twenty countries attended the conference where they discussed regulatory, economic, and environmental issues surrounding the development of unconventional shale gas.¹⁴ Following the conference, the United States signed agreements with China, India, and Poland to provide support in furtherance of their individual development goals.

There is no shortage of scholarly research on the Shale Gas Revolution and the environmental, economic, and social impacts of fracking.¹⁵ The literature is replete with articles concerning whether or not shale gas is in fact a "bridge fuel" that can lead to reductions in climate change.¹⁶ There are also numerous articles articulating the effects of the U.S. gas boom on geo-political relations throughout the world.¹⁷ While many have written on the surge in shale gas production in the

11. John Kerry, U.S. Sec'y of State, Remarks at the U.S.-E.U. Energy Council Meeting (Apr. 2, 2014).

12. Nat Parry, *Beneath the Ukraine Crisis: Shale Gas*, CONSORTIUM NEWS (Apr. 24, 2014), <http://consortiumnews.com/2014/04/24/beneath-the-ukraine-crisis-shale-gas/>.

13. Information about the UGTEP program contained in this article was obtained from the State Department's UGTEP website (<http://m.state.gov/mc38721.htm>) as well as a conversation with a State Department employee involved in the administration of UGTEP.

14. David L. Goldwyn, *Global Shale Gas Initiative: Balancing Energy Security and Environmental Concerns*, DIPNOTE, U.S. DEP'T OF STATE OFFICIAL BLOG (Sept. 3, 2010), <http://blogs.state.gov/stories/2010/09/03/global-shale-gas-initiative-balancing-energy-security-and-environmental-concerns>.

15. See, e.g., Elizabeth Burleson, *Cooperative Federalism and Hydraulic Fracturing: A Human Right to a Clean Environment*, 22 CORNELL J.L. & PUB. POL'Y 289 (2012); Michael Esposito, Comment, *Water Issues Set the Pace for Fracking Regulations and Global Shale Gas Extraction*, 22 TUL. J. INT'L & COMP. L. 167 (2013); Jason Obold, *Leading By Example: The Fracturing Responsibility and Awareness of Chemicals Act of 2011 as a Catalyst for International Drilling Reform*, 23 COLO. J. INT'L ENVTL. L. & POL'Y 473 (2012); Patrick Parenteau & Abigail Barnes, *A Bridge Too Far: Building Off-Ramps on the Shale Gas Superhighway*, 49 IDAHO L. REV. 325 (2013); Evan J. House, *Fractured Fairytales: The Failed Social License for Unconventional Oil and Gas Development*, 13 WYO. L. REV. 5 (2013); Timothy Fitzgerald, *Frackonomics: Some Economics of Hydraulic Fracturing*, 63 CASE W. RES. L. REV. 1337 (2013).

16. See generally *id.*

17. See, e.g., Sarah O. Ladislaw et al., *New Energy, New Geopolitics, Balancing Stability and Leverage*, CTR. FOR STRATEGIC & INT'L STUDIES (Apr. 2014), http://latimesblogs.latimes.com/world_now/2012/10/us-boon-from-shale-gas-fracking-holds-little-global-promise.html.

United States, its ramifications on global warming, and global politics, this article is different in that it focuses on one particular U.S.-led program and discusses the things about that program that are being done right—as well as areas that should be improved.

Because U.S. taxpayer-funded global expansion of unconventional shale gas development could have dire consequences on our economy, as well as our political and diplomatic alliances, if it is not conducted carefully, the importance of this inquiry cannot be overstated. Some are already questioning why the government is footing the bill so that U.S. companies, already in a position of world leadership in unconventional gas development, can expand their success overseas.¹⁸

This article suggests that a combination of informal norms and formal legal mechanisms in the administration of UGTEP can help strike a balance between growing our global economy, fostering diplomatic relations, and protecting the people and places where drilling will occur. First, the concept of technology transfer, and more specifically, environmentally sound technology transfer as defined by Agenda 21,¹⁹ should guide and supplement UGTEP. Second, private U.S. companies seeking to participate in the program should want to, and be encouraged to respond to “demands . . . and expectations for a business enterprise that emerge from neighbors, environmental groups, community members, and other elements of the surrounding civil society.”²⁰ That is, these companies should seek out a social license to drill in nations where water scarcity and quality issues rival and even surpass those seen in the United States. Finally, because these informal mechanisms may not ensure protection of the people and places affected by unconventional gas development, Congress should require a NEPA-like analysis for each UGTEP-related project funded or supported by U.S. tax dollars.

In order to frame the issues and arguments presented, it is important to define the scope of this article. First, this article does not take a stand on whether hydraulic fracturing is safe or not—rather, it acknowledges that there are ongoing debates on this issue. Similarly, this article does not address whether shale gas is really a “bridge fuel” capable of reducing global greenhouse gas emissions. The Obama Administration often takes this position to support the expansion of global shale gas development.²¹ Instead, this article focuses on a single government

18. See, e.g., Steve Peacock, *Obama to Help Thriving 'Fracking' Industry Set Up Shop in China*, PEACOCKBIZ.COM (Dec. 16, 2012, 4:36 AM), <http://peacockbiz.typepad.com/tram/2012/12/obama-to-help-thriving-fracking-industry-set-up-shop-in-china.html> (discussing U.S. Trade and Development Agency, Contracts Office, Solicitation No. RFP-CO201361047, in which the UTDA solicited bids from U.S. companies for a two-year contract to provide support to the U.S.-China Shale Gas Training Program. The contract was eventually awarded to the Gas Technology Institute for a cost of approximately \$378,000).

19. *Transfer of Environmentally Sound Technology, Cooperation and Capacity Building*, UNEP, <http://www.unep.org/Documents.multilingual/Default.asp?DocumentID=52&ArticleID=84&l=en> (last visited Jan. 29, 2015).

20. Kristen Rice, *Freezing to Heat the Future: Streamlining the Planning and Monitoring of Arctic Hydrocarbon Development*, 24 COLO. NAT. RES., ENERGY & ENVTL. L. REV. 391, 417 (2013) (quoting Neil Gunningham, Robert A. Kagan & Dorothy Thornton, *Social License and Environmental Protection: Why Businesses Go Beyond Compliance*, 29 L. & Soc. Inquiry 307, 308 (2004)).

21. However, many disagree with this assessment. For instance, Ken Caldeira, a climate scientist at the Carnegie Institution of Science's Department of Global Ecology recently told reporters that “natural gas is a bridge to a world with high CO₂ levels, melting ice caps, [and] acidified oceans.” Brad Johnson, *Obama*

program and ways to improve upon it. However, despite this narrow focus, UGTEP is a good example from which we can think more generally about technology transfer programs and their design. That is, there are larger lessons to be learned from this analysis.

Part I of the article examines the surge in production of unconventional shale gas in the United States, provides insight into the scale of production that has occurred since 2005, and briefly examines the potential for developing unconventional shale gas abroad. Part II describes the UGTEP program, including the stated purpose of the program, some of the nations currently participating in it, and a description of the unique challenges to developing unconventional resources outside of the United States. In Part III, informal norms, including technology transfer and social license, are suggested as methods of ensuring that U.S. participation (in terms of both government and private industry) in these development activities is done in a prudent manner. Finally, Part IV offers an unconventional solution for unconventional development. Congress could require U.S. companies participating in the program to conduct a NEPA-like analysis before proceeding with unconventional shale gas development in foreign nations. The article concludes that while the UGTEP program does offer some guidance on how to conduct unconventional exploration and production in an “environmentally sound” manner, much more can, and should, be done to protect the people and places where drilling will occur.

II. THE NEW AMERICAN REVOLUTION

A. *Advancements in Technology*

As conventional sources of oil and gas began to decline in the United States, the energy industry sought new methods of extraction beyond the traditional vertical well.²² In the mid-2000s, horizontal drilling, paired with improvements in hydraulic fracturing technology, fundamentally changed the energy outlook of the United States.²³ These two processes, when combined, allow industry to economically extract large amounts of gas trapped in shale rock.²⁴ While a horizontal well costs much more to drill than a vertical well, the use of hydraulic fracturing to stimulate a well results in far greater output from each well.²⁵

Today, because of the combination of these two technologies, the United States is the undisputed world leader in unlocking unconventional shale gas

Administration Rushes to Expand Fracking on Public Lands, Despite Frightening Evidence, THINK PROGRESS (Aug. 16, 2013, 9:44 AM), <http://thinkprogress.org/climate/2013/08/16/2471231/administration-expand-fracking-public-lands/>.

22. House, *supra* note 15, at 9-10.

23. Susan L. Sakmar, *The Global Shale Gas Initiative: Will The United States Be The Role Model For The Development Of Shale Gas Around The World?*, 33 HOUS. J. INT'L L. 369, 376-77 (2011).

24. Jennifer L. Miskimins, Jeff Johnson & Mark Turner, *The Technical Aspects of Hydraulic Fracturing*, Rocky Mt. Min. L. Found., no. 5, 2011, at 1-9 (on file with author). While these technologies are also used to extract shale oil, this article focuses solely on shale gas.

25. S.D. Joshi, *Cost/Benefits of Horizontal Wells*, SOC'Y OF PETROLEUM ENG'RS, SPE 83621 (2003), available at <http://www.joshitech.com/images/spe83621.pdf>.

reserves²⁶—reserves that industry experts once considered uneconomical to produce.²⁷ According to the U.S. Energy Information Administration (EIA), gross withdrawals of shale gas in the United States increased from 169,026 million cubic feet (mcf) in December 2007 to 928,226 mcf in December 2012.²⁸

B. Reasons for Expanded Development of Unconventional Gas

Since taking office in 2008, President Obama has publically supported collaborative efforts for the continued expansion of shale gas exploration and production citing energy independence, economic stimulation, and climate change reduction as the goals supporting expansion efforts.²⁹ In fact, members of the Obama Administration, including Vice President Joe Biden and Secretary of State John Kerry, have been likened to “modern day missionar[ies]” spreading “the gospel of fracking” in order to advance the interests of the United States.³⁰

For the United States, energy independence means less reliance on oil from the Middle East. In other parts of the world, energy security, another frequently cited reason to expand development of shale gas, means developing a supply of energy from a nation’s own resources to protect against situations where a supplying nation cuts off supplies to another for various (often political) reasons.

Besides energy independence, the Obama Administration often points to the economic benefits of government-supported shale gas exploration and development. In his 2012 State of the Union address, the President remarked, “[I]t was public research dollars, over the course of 30 years, that helped develop the technologies to extract all this natural gas out of shale rock—reminding us that government support is critical in helping businesses get new energy ideas off the ground.”³¹ The cooperative development referred to by the President was the collaboration of the U.S. Department of Energy and researchers working for George Mitchell, commonly known as the “father of fracking,” to improve hydraulic fracturing technology.³² The result of that collaboration was the advent

26. The difference between conventional and unconventional reserves is whether the oil or gas has migrated out of the source rock to form pools (conventional reserve) or if the oil or gas is trapped within the source rock (unconventional reserve). Conventional pools of oil and gas are essentially low-hanging fruit - these resources are easy to extract, and thus, their supplies have dwindled as demand for energy has continued to increase globally. U.S. Energy Info. Admin., *Shale in the United States*, U.S. DEP’T OF ENERGY, http://www.eia.gov/energy_in_brief/article/shale_in_the_united_states.cfm (last updated Sept. 4, 2014).

27. Sakmar, *supra* note 23, at 370-71.

28. U.S. Energy Info. Admin., *U.S. Natural Gas Gross Withdrawals from Shale Gas*, U.S. DEP’T OF ENERGY, http://www.eia.gov/dnav/ng/hist/ngm_epg0_fgs_nus_mmcfm.htm (last visited Jan. 25, 2015).

29. Press Release, The White House, Office of the Press Sec’y, Remarks by the President in State of the Union Address (Jan. 24, 2012).

30. Steve Horn, *Vice President Joe Biden Promotes U.S. as Fracking Missionary Force on Ukraine Trip*, DESMOGBLOG (Apr. 23, 2014, 12:18 PM), <http://www.desmogblog.com/2014/04/23/vice-president-joe-biden-promotes-u-s-fracking-missionary-force-during-ukraine-trip>. Steve Horn utilizes an analogy from the book, *Doing Missionary Work*, wherein Elizabeth Ocampo and Dean Neu draw an analogy between missionaries and the World Bank. See generally ELIZABETH OCAMPO & DEAN NEU, *DOING MISSIONARY WORK, THE WORLD BANK AND THE DIFFUSION OF FINANCIAL PRACTICES* (Brenda Conroy ed., Fernwood Publ’g 2008).

31. State of the Union Address, *supra* note 29.

32. Michael Graczyk & Jonathan Fahey, *George P. Mitchell, Texas Oilman and ‘Father of Fracking,’ Dies at 94*, HUFFINGTON POST (July 26, 2013, 12:37 AM), http://www.huffingtonpost.com/2013/07/27/george-p-mitchell-dies_n_3662253.html; see also Kevin Begos, *Fracking Developed With Decades of Government Investment*, HUFFINGTON POST (Sept. 23, 2012, 10:13 AM),

of slickwater fracking, a process that uses large amounts of chemical-laced water and proppants to fracture shale rock.³³ While fracking has technically occurred for decades, it was not until the addition of water and proppants that unconventional shale gas production sky-rocketed.

The third suggested benefit of expansion of shale gas exploration and development is reductions in global emissions of greenhouse gases (GHGs). This remains a contentious point among scientists, scholars, and other various groups. The veracity of this claim is not explored within this article, but instead is noted as one of the reasons the Obama Administration has supported shale gas development on a global scale.

C. Potential for Unconventional Shale Gas Outside of the United States

While the United States is currently the global leader in unconventional natural gas production, shale gas reserves exist in almost every region of the world.³⁴ Vast supplies of cheap energy via horizontal drilling and hydraulic fracturing can be very alluring to those nations seeking to stimulate development, ensure energy security, and according to some, reduce GHG emissions.³⁵

However, each nation has its own set of unique issues. For example, Poland, a country with shale gas reserves, would like to develop those resources in order to reduce dependence on natural gas and crude oil supplies from Russia.³⁶ Additionally, as Europe's second largest coal producer, Poland could benefit from the development of cleaner energy sources.³⁷ Similarly, China's greenhouse gas levels require it to find alternatives to its current reliance on coal.³⁸

While two-thirds of assessed, *technically recoverable* shale gas resources are concentrated in six countries—the United States, China, Argentina, Algeria, Canada, and Mexico—many nations lack the technology or experience to identify and quantify their levels of *economically recoverable* unconventional shale gas reserves.³⁹ Consequently, in 2010, the U.S. State Department launched a program that would allow the United States to pass on some of the lessons learned in the Shale Gas Revolution to foreign nations interested in developing their own resources.⁴⁰

http://www.huffingtonpost.com/2012/09/23/fracking-developed-government_n_1907178.html (disputing claims that the fracking boom happened outside of any influence from Washington).

33. See generally *id.*

34. Sakmar, *supra* note 23, at 371.

35. Stephen L. Kass, *Worldwide: Countries Approach Fracking with Interest and Caution*, MONDAQ, <http://www.mondaq.com/unitedstates/x/284506/Climate+Change/Countries+Approach+Fracking+With+Interest+and+Caution> (last updated Jan. 6, 2014).

36. U.S. Energy Info. Admin., *Poland Overview*, U.S. DEP'T OF ENERGY, <http://www.eia.gov/countries/country-data.cfm?fips=PL> (last updated May 30, 2013).

37. *Id.*

38. Chris Buckley, *China's Plan to Limit Coal Use Could Spur Consumption for Years*, N.Y. TIMES (July 24, 2014), http://www.nytimes.com/2014/07/25/world/asia/chinese-plan-to-reduce-coal-use-could-allow-increases-for-years.html?_r=0.

39. U.S. ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, TECHNICALY RECOVERABLE SHALE OIL AND SHALE GAS RESOURCES: AN ASSESSMENT OF 137 SHALE FORMATIONS IN 41 COUNTRIES OUTSIDE THE UNITED STATES 10 (2013), available at <http://www.eia.gov/analysis/studies/worldshalegas/pdf/overview.pdf>.

40. *Id.* at 5.

III. THE UNCONVENTIONAL GAS TECHNICAL ENGAGEMENT PROGRAM (UGTEP)

A. *The U.S. State Department and Its Role in Global Energy Issues*

As the United States quickly moved into the position of global leader in unconventional natural gas development, two things happened. First, foreign investors started sinking huge amounts of money into the American energy sector.⁴¹ Second, foreign nations sought the expertise of the United States in identifying and developing their own unconventional reserves in hopes of replicating the U.S. experience.⁴²

Many “experts predict that natural gas will serve as a foundation fuel for the twenty-first century global economy.”⁴³ Additionally, natural gas is touted by many as a “bridge fuel” to a cleaner, more climate-friendly, global energy future.⁴⁴ Regardless of whether this is true or not, the State Department, under the Obama Administration, has made it a priority to promote unconventional natural gas development as a way to address climate change as well as boost the economy.⁴⁵ The United States government offers three categories of support to achieve this goal: policy development, public-private partnerships, and worker training.⁴⁶

Recognizing the State Department’s unique position and ability to “link U.S. international energy efforts with [its] broader international economic interests, [its] foreign policy imperatives, and [its] development objectives,” former Secretary of State Hillary Clinton created the Bureau of Energy Resources (ENR) within the State Department to help meet these global energy goals.⁴⁷

B. *An Overview of UGTEP*

In April 2010, the State Department launched the Global Shale Gas Initiative (GSGI), later renamed the Unconventional Gas Technical Engagement Program (UGTEP), under the Bureau of Energy Resources. The purpose of the program was to help countries identify and develop their unconventional natural gas resources safely and economically.⁴⁸ By sharing U.S. federal and state governments’ technical expertise, regulatory experience, and diplomatic

41. U.S. Energy Info. Admin., *Foreign Investors Play Large Role in U.S. Shale Industry*, U.S. DEP’T OF ENERGY (Apr. 8, 2013), <http://www.eia.gov/todayinenergy/detail.cfm?id=10711>.

42. Laura Alfaro, Richard H.K. Vietor & Hilary White, *The U.S. Shale Revolution: Global Rebalancing?*, Teaching Note 9-714-052, HARV. BUS. SCH. at 10 (Mar. 13, 2014), available at https://www.alumni.hbs.edu/Documents/reunions/Vietor_US%20Shale%20Case.pdf.

43. Parenteau & Barnes, *supra* note 15, at 326.

44. Dominic Contreras, *Natural Gas as a Bridge to the Future*, HARV. U., BELFER CTR. FOR SCI. & INT’L AFFAIRS (Apr. 11, 2012), http://www.belfercenter.ksg.harvard.edu/publication/21924/natural_gas_as_a_bridge_to_the_future.html.

45. See generally U.S. DEP’T OF STATE, U.S. CLIMATE ACTION REPORT TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, FIRST BIENNIAL REPORT 12, 21 (2014).

46. *Id.* at 19.

47. U.S. DEP’T OF STATE, LEADING THROUGH CIVILIAN POWER—THE FIRST QUADRENNIAL DIPLOMACY AND DEVELOPMENT REVIEW 38-40 (2010), available at <http://www.state.gov/documents/organization/153108.pdf>.

48. *Unconventional Gas Technical Engagement Program*, U.S. DEP’T OF INTERIOR, <http://www.doi.gov/intl/itap/ugtep.cfm> (last visited Jan. 24, 2015) [hereinafter *UGTEP*].

capabilities with “selected” countries,⁴⁹ the State Department believed UGTEP could help achieve greater global energy security, protect environmental resources, and further U.S. economic and commercial interests.⁵⁰ While the precise reasons behind the government’s decision to launch UGTEP (rather than leaving this to private sector investment) are hard to ascertain, it seems likely that having an official government hand in “helping” nations develop their resources could result in positive political and economic outcomes for the United States.⁵¹

Utilizing “government to government policy engagement,” various other U.S. government agencies outside the State Department also participate in the implementation of UGTEP.⁵² These agencies include: the U.S. Agency for International Development; the Department of Interior U.S. Geological Survey; the Bureau of Land Management; the Department of Commerce Commercial Law Development Program; the Environmental Protection Agency; and the Department of Energy Office of Fossil Energy.⁵³ Each of these agencies has participated in various UGTEP conferences providing participants with comprehensive guidance related to their respective fields of expertise.⁵⁴

The State Department selected participants for the program based on factors such as the presence of shale gas within a nation, the market and business dynamics of that nation, the geopolitical conditions occurring there, and finally, the nation’s expressed interest in learning from the U.S. experience.⁵⁵ Some of the assistance provided by UGTEP to these “selected” foreign nations includes: (i) shale gas resource assessments; (ii) technical guidance in evaluating production capacity; (iii) economics and investment advice; and (iv) workshops/seminars covering technical, environmental, business, and regulatory issues both in the United States and in the host nation.⁵⁶

In August 2010, the State Department hosted the first ever Global Shale Gas Initiative conference in Washington, D.C.⁵⁷ Representatives from over twenty nations, such as China, India, Poland, Jordan, Chile, and South Africa, attended the event.⁵⁸ Russia was not among those nations invited to participate.

During the first conference, participating nations learned about the role of shale gas in the global energy supply.⁵⁹ Further, they learned how to assess the

49. *Id.* According to the State Department, the countries that have participated in UGTEP include Mexico, Colombia, Chile, Poland, Ukraine, Bulgaria, Romania, Lithuania, Jordan, Kazakhstan, Morocco, India, China, Indonesia, Vietnam, South Africa, and Botswana. *Id.*

50. *Id.*

51. *Id.*

52. *Id.*

53. *Id.*

54. The State Department’s UGTEP website used to divide nations into “priority” and “non-priority” nations. However, the website has been revised, and now only contains one reference to “priority” nations without addressing “non-priority” nations at all. The description of “non-priority” nations, now removed from the website, described these nations as those who had expressed an interest and met the program’s criteria. It also indicated that those nations could participate in conferences and other training held in the United States, but would not receive in-country assistance.

55. *UGTEP*, *supra* note 48.

56. *Id.*

57. Goldwyn, *supra* note 14.

58. *Id.*

59. *Id.*

extent of their own shale gas resources and how the interplay of infrastructure, technology, and investment climate are necessary for unconventional shale development.⁶⁰

During the initial briefing on the conference, David Goldwyn, the former director and founder of GSGI, said the motivation of foreign nations and the State Department to collaborate on unconventional shale gas development was to enhance foreign policy and promote global energy security.⁶¹ Additionally, Mr. Goldwyn touted the importance of the UGTEP conference as a path to achieving climate security.⁶²

Another stated goal of the conference was to share information with foreign nations on how to develop their shale gas resources in a safe and efficient manner.⁶³ A portion of the first conference included presentations by the Environmental Protection Agency on federal regulations for the protection of water supplies, and the Bureau of Land Management and Department of the Interior on regulations for shale gas development on federal lands including the use of environmental impact assessments.⁶⁴ When asked about the participation of U.S. companies at the conference, Mr. Goldwyn indicated that while they were present, the goal of this conference was to share regulatory information with the participants, rather than the promotion of trade with U.S. companies.⁶⁵ However, the development of trade is a key driving force behind this collaboration, despite Mr. Goldwyn's statement.

Since this initial conference, industry has played a key role in UGTEP. For example, the Colorado School of Mines' Unconventional Natural Gas Institute (UNGI) has been awarded a grant by the State Department to provide training to foreign nations under the UGTEP program. This program relies on industry experts to provide much of the training.⁶⁶

C. *Participating Nations, Their Unique Motivations, and Challenges*

Individual nations face unique challenges in the identification and development of their unconventional shale gas resources. Technically recoverable reserves are not always synonymous with economically recoverable reserves.⁶⁷ The levels of a country's shale deposits may look very attractive at first glance,

60. *Id.*

61. David L. Goldwyn, *Briefing on the Global Shale Gas Initiative*, U.S. DEP'T OF STATE (Aug. 24, 2010), <http://m.state.gov/md146249.htm>.

62. *Id.*

63. *Id.*

64. *Id.*

65. *Id.* Additionally, during a recent conversation with a State Department employee involved in the management of UGTEP, it was stressed to the author that UGTEP is a "government to government program." According to this source, the State Department does not advocate on the part of private industry. However, acknowledging that private industry is on the forefront of development, the employee stated that private industry is included in conversations with foreign nations so that they can discuss their experiences. Any companies targeted for involvement in UGTEP are chosen based on their experience with unconventional gas development, experience overseas, and a record of following best practices or having established international standards.

66. *Unconventional Gas Technology Engagement Program (UGTEP) International Training*, COLO. SCH. OF MINES UNCONVENTIONAL NATURAL GAS & OIL INST., <http://ungi.mines.edu/training.html> (last visited Feb. 17, 2015).

67. TECHNICALLY RECOVERABLE SHALE OIL AND SHALE GAS RESOURCES, *supra* note 39, at 10.

but may be disappointingly hard to develop due to geological and geographical hurdles.⁶⁸ This can include shale deposits being located much further below the surface than deposits found in the United States.⁶⁹ The density and porosity of the rock containing the shale gas can also affect drilling. Additionally, when deposits are located in areas that are hard to reach or in areas of seismic activity, for example, the ability to produce the gas can be greatly impaired.

Other “above-the-ground” factors can also significantly influence the economic value of shale gas reserves. For example, technical and water resource challenges, regulatory hurdles, transportation constraints, and competition with other fuels and conventional natural gas can all affect a nation’s ability to successfully develop its resources.⁷⁰ Additionally, private ownership of mineral rights in the United States compared to state-owned minerals in places like China and Britain can reduce foreign investor interest.⁷¹ To address these individual situations, UGTEP offers an à la carte menu to countries tailoring the cooperation they need.⁷² The following discussion covers some of the participating nations, their unique motivations, and challenges to beginning or expanding their unconventional shale gas programs.⁷³

UGTEP is involved with countries on nearly every continent. From Argentina and Brazil in South America, to Botswana and South Africa in Africa, UGTEP’s reach is truly global.⁷⁴ Rather than showcasing the details of each and every partnership, the following section addresses only a small selection of participant nations. These particular nations were chosen for inclusion not only because of their unique circumstances related to unconventional shale development, but additionally for their particular human rights concerns. Human rights are discussed in Part III as one reason why it is important to ensure that UGTEP, and similar programs, are administered in a responsible manner.

68. Scheck & Williams, *supra* note 7, at B2.

69. TECHNICALLY RECOVERABLE SHALE OIL AND SHALE GAS RESOURCES, *supra* note 39, at 11.

70. *Id.* Additionally, while this article has focused on shale gas, falling crude oil prices mean it is now more expensive to produce a barrel of shale oil in many places than a company can sell it for. See Scheck & Williams, *supra* note 7, at B1.

71. Jeff McMahon, *Six Reasons Fracking Has Flopped Overseas*, FORBES (Apr. 7, 2013, 9:00 AM), <http://www.forbes.com/sites/jeffmcmahon/2013/04/07/six-reasons-fracking-has-flopped-overseas/>; see also Scheck & Williams, *supra* note 7, at B2.

72. UGTEP, *supra* note 48.

73. According to the State Department’s UGTEP page, to date, bilateral and multilateral engagement with UGTEP and the following nations has occurred: Mexico, Colombia, Chile, Poland, Ukraine, Bulgaria, Romania, Lithuania, Jordan, Kazakhstan, Morocco, India, China, Indonesia, Vietnam, South Africa, Botswana, and a “number of other countries.” However, the 2014 State Department Budget Request states that UGTEP “activities and engagement currently focus on Bangladesh, Brazil, China, India, Indonesia, Jordan, Mexico, Poland, South Africa, and Ukraine.” U.S. DEP’T OF STATE CONGRESSIONAL BUDGET JUSTIFICATION, Vol. 2, Foreign Operations, Fiscal Year 2014, at 225. Additionally, Albania, Algeria, Argentina, Botswana, Bulgaria, Burma, Cambodia, Chile, Colombia, Czech Republic, Hungary, Indonesia, Israel, Kazakhstan, Laos, Lithuania, Malaysia, Mongolia, Morocco, Papua New Guinea, Peru, Philippines, Romania, Slovakia, Slovenia, Thailand, Tunisia, Turkey, Uruguay, and Vietnam are expected to be engaged bilaterally or by regional workshops during FY 2014. *Id.* Based on these seemingly inconsistent lists of participants, it is impossible to know what constitutes “engagement” and which nations make up the group of “other” participants.

74. UGTEP, *supra* note 48.

1. Ukraine

According to the State Department, the motive to cooperate in unconventional shale gas development, particularly in Poland and Ukraine, is diplomatic.⁷⁵ “[W]e saw that their political survival, their economic survival, depended on diversifying their sources of energy because they’re so dependent on Russia for gas.”⁷⁶ The recent political turmoil between Ukraine and Russia underscores the importance that natural gas plays in the relationship between these two nations. A State Department source claims the United States and Ukraine are actively working on legislation related to the development of Ukraine’s unconventional resources and the formation of production sharing agreements.⁷⁷

Ukraine imports two-thirds of its natural gas from Russia and has had repeated conflicts over supply and pricing.⁷⁸ Ukraine also links Europe and Russia via a series of gas pipelines through which Russian natural gas is exported to Europe.⁷⁹ In fact, Europe gets 16% of its natural gas from Russia.⁸⁰ Several years ago, Ukraine increased the trans-shipment fees on Russian gas running through Ukraine, resulting in Russia cutting off supplies to Europe.⁸¹ Russia also cut off Ukraine’s supply of natural gas in 2006, 2009, and once again in early March 2014.⁸² During the first week of April 2014, Gazprom, Russia’s state-controlled natural gas supplier, hiked the price of gas for Ukraine twice resulting in an 80% price increase from the previous week.⁸³

In February 2014, a popular uprising in Ukraine led to the overthrow of President Yanukovich.⁸⁴ The former President sparked outrage in November 2013 when he refused to sign a deal that would bring Ukraine closer to the European Union. Instead, he announced that Ukraine would form closer economic ties with Russia.⁸⁵ Many believe the uprising illustrated a global power struggle

75. Werth, *supra* note 6.

76. *Id.*

77. U.S.–Ukraine Strategic Partnership Commission, U.S. EMBASSY–KYIV, UKRAINE (Feb. 15, 2011), <http://ukraine.usembassy.gov/joint-statement.html>.

78. Paul Kirby, *Russia’s gas fight with Ukraine*, BBC NEWS (Oct. 31, 2014), <http://www.bbc.com/news/world-europe-29521564>.

79. U.S. Energy Info. Admin., *Ukraine, Country Analysis Note*, EIA.GOV, <http://www.eia.gov/countries/country-data.cfm?fips=up> (last updated May 30, 2013).

80. U.S. Energy Info. Admin., *16% of Natural Gas Consumed in Europe Flows through Ukraine*, U.S. DEP’T OF ENERGY (Mar. 14, 2014), <http://www.eia.gov/todayinenergy/detail.cfm?id=15411>.

81. Robert Lea, *Europe plunged into energy crisis as Russia cuts off gas supply via Ukraine*, DAILY MAIL (Jan. 7, 2009), <http://www.dailymail.co.uk/news/article-1106382/Europe-plunged-energy-crisis-Russia-cuts-gas-supply-Ukraine.html>.

82. Werth, *supra* note 6.

83. D. Astakhov, *Russia Hikes Gas Prices for Ukraine by 80%*, MOSCOW TIMES (Apr. 4, 2014), <http://www.themoscowtimes.com/business/article/russia-hikes-gas-prices-for-ukraine-by-80/497478.html>.

84. James Marson, Alan Cullison & Alexander Kolyandr, *Ukraine President Viktor Yanukovich Driven From Power*, WALL ST. J. (Feb. 23, 2014, 7:11 AM), <http://www.wsj.com/articles/SB10001424052702304914204579398561953855036>.

85. Kathy Lally, *Deposed Yanukovich Wants Russia to Give Crimea Back to Ukraine*, WASH. POST (Apr. 2, 2014), http://www.washingtonpost.com/world/deposed-yanukovich-wants-russia-to-give-crimea-back-to-ukraine/2014/04/02/e37124b6-561b-45c6-9390-a0d7d346ded6_story.html.

centering on natural gas supplies, hydraulic fracturing, and Europe's reliance on Russia for its natural gas supplies.⁸⁶

While currently dependent on Russia for gas, Ukraine has significant shale deposits of its own. As part of its participation in UGTEP, the U.S. Agency for International Development (USAID) created the Ukraine Shale Gas Environmental and Regulatory Assessment.⁸⁷ The purpose was to prepare the Ukrainian government to exploit their unconventional gas reserves by developing an environmentally sound framework, environmental reviews, improved regulatory approaches, and more transparent and efficient contract tendering.⁸⁸

In the weeks following the invasion of Ukraine by Russia, Congress held a series of hearings aimed at promoting global expansion of unconventional gas based on the U.S. model.⁸⁹ In March, the Senate Energy and Natural Resources Committee held a hearing entitled "Importing Energy, Exporting Jobs. Can It Be Reversed?"⁹⁰ During the hearing, Senator Mary Landrieu (D-LA) emphasized the importance of sharing the U.S. experience with other nations. She stated that:

The events in the Ukraine have shown that Russia President Putin is intent on using his monopoly on energy supplies to pressure our allies in Europe to advance his economic and philosophical agenda. . . . The last thing Putin and his cronies want is competition from the United States of America in the energy race.⁹¹

While many denounce the recent actions of Russia, significant human rights violations related to oil and gas have taken place in Ukraine for years. For example, former Prime Minister Yulia Tymoshenko was sentenced to a seven-year prison sentence on charges related to a natural gas contract with Russia.⁹² This politically motivated action was spearheaded by former President Yanukovich. Indeed, corruption is deeply embedded in Ukrainian politics. For example, in November 2012, *Forbes* (Ukraine edition) printed an investigation into Sergey Kurchenko, a politically-tied Ukrainian businessman, which chronicled various facets of his rapidly expanded fortune and control of Ukrainian oil and gas interests.⁹³ The investigation revealed that Kurchenko holds close ties with former President Yanukovich and his son, who are believed to be part of the

86. Steven A. Cook, *Ukraine's Uprising: More than an Economic Crisis*, FORTUNE (Feb. 28, 2014), <http://fortune.com/2014/02/28/ukraines-uprising-more-than-an-economic-crisis/>; Peter Grazul, *Ukraine's Revolution Fueled by International Energy Politics*, GUARDIAN LIBERTY VOICE (Jan. 26, 2014), <http://guardianlv.com/2014/01/ukraines-revolution-fueled-by-international-energy-politics/>.

87. UNITED STATES AGENCY INTERNATIONAL DEVELOPMENT (USAID), UKRAINE SHALE GAS: VOLUME 1: ENVIRONMENTAL AND REGULATORY ASSESSMENT (May 1, 2012).

88. *Id.*

89. Steve Horn, *Follow the Money: Three Energy Export Congressional Hearings, Not Climate Change Discussion*, DESMOGBLOG (Mar. 26, 2014, 4:38 AM), <http://www.desmogblog.com/2014/03/26/follow-the-money-3-energy-export-congressional-hearings-no-climate-change-discussion>.

90. *Importing Energy, Exporting Jobs. Can it be Reversed?: Hearing Before the S. Energy & Natural Resources Comm.*, 113th Cong. 263 (2014) (opening statement of Sen. Mary L. Landrieu, Chairwoman, S. Comm. on Energy & Natural Res.).

91. *Id.*

92. In early 2014, Ukraine's parliament ordered her release from prison. Conal Urquhart, *Ukraine: Yulia Tymoshenko released as country lurches toward split*, THE GUARDIAN (Feb. 22, 2014), <http://www.theguardian.com/world/2014/feb/22/yulia-tymoshenko-released-ukraine-lurches-split>.

93. Sevgil Musaeva & Alexander Akimenko, *Investigation: Gas Killing All Ukraine*, FORBES UKRAINE (Nov. 12, 2012, 3:00 PM), <http://forbes.ua/business/1341072-rassledovanie-gazovyy-korol-vsey-ukrainy>.

a widely perceived corrupt group of politicians and businessmen known as the “Family.” The journalists who published the story feared for their lives. Their fears worsened when Miguel Forbes, *Forbes Media* president for television and licensing, sold the *Forbes Ukraine* brand license to Kurchenko—the very same person that the magazine had previously reported as having large-scale corrupt ties relating to oil and gas.⁹⁴

The scale of corruption and human rights violations in Ukraine has drawn international attention. During recent talks in Geneva aimed at de-escalating the crisis in Ukraine, U.N. Assistant Secretary-General for Human Rights, Ivan Simonovic, testified about his recent visit to the eastern portions of the country.⁹⁵ He cited strong links between human rights violations, the Maidan protests which resulted in the ousting of former President Yanukovich, and the tensions in the eastern sections of Ukraine.⁹⁶ With a “poor” record on human rights, it is incumbent upon the United States to ensure that U.S. companies conducting unconventional development in Ukraine are able to do so outside the scope of any politically motivated corruption.

2. Poland

Similar to Ukraine, Poland imports most of its natural gas from Russia, Norway, and Germany.⁹⁷ However, Poland is believed to hold the largest shale gas reserves in Europe.⁹⁸ “Of the countries interested in expanding their hydraulic fracturing operations, Poland has been one of the most aggressive in seeking to develop its shale gas resources through the construction of new energy facilities.”⁹⁹ Poland has also participated in various UGTEP-sponsored visitor programs here in the United States. Despite this, the actual development of Poland’s shale reserves has been slow.¹⁰⁰

One of the reasons for this slow development is the original estimate of Poland’s technically recoverable reserves dropped from the 2011 estimate of 187 trillion cubic feet (tcf) to 148 tcf in 2013.¹⁰¹ Based on these new numbers, as well as disappointing test flows from wells,¹⁰² ExxonMobil ceased exploration in 2012 and Marathon announced that it would discontinue operations in Poland in May

94. Greg Satell, *A Look Back at how the Ukraine Crisis Erupted and What to Expect in 2015*, FORBES (Dec. 13, 2014, 1:09 AM), <http://www.forbes.com/sites/gregsatell/2014/12/13/a-look-back-at-how-the-ukraine-crisis-erupted-and-what-to-expect-in-2015/>.

95. U.N. News Service, *Secretary-General Welcomes Initial Talks in Geneva to Defuse Ukraine Crisis*, REF WORLD (Apr. 17, 2014), <http://www.refworld.org/docid/53622d0c4.html>.

96. *Id.*

97. *Poland Overview*, *supra* note 36.

98. Justin P. Atkins, *Hydraulic Fracturing in Poland: A Regulatory Analysis*, 12 WASH. U. GLOBAL STUD. L. REV. 339, 340 (2013).

99. *Id.* at 348.

100. J. Wesley Bennett, Randall W. Jackson & Robert Blobaum, *The State of Play in Poland’s Unconventional Shale and Oil Development* (Reg’l Research Inst., Working Paper No. 2013-06).

101. *Poland Overview*, *supra* note 36.

102. Marek Strzlecki & Isis Almeida, *Fracking Setback in Poland Dims Hope for Less Russian Gas*, BLOOMBERG (Oct. 10, 2014), <http://www.bloomberg.com/news/2014-10-09/fracking-setback-in-poland-dim-hopes-for-less-russian-gas.html> (noting that the highest test flows in the past five years have been just 30% of that needed for commercial production).

2013.¹⁰³ However, ConocoPhillips has stated that it will continue drilling, despite the fact that Poland lacks “real nice rock layers like . . . the U.S.”¹⁰⁴ While most of the oil and gas giants are packing up operations in Poland, smaller companies are sticking around, for now.¹⁰⁵ According to the executive chairman of San Leon Energy, PLC, “the reality is it’s going to be down to the smaller companies to prove the [Polish] play, as they did in the U.S.”¹⁰⁶

Geology is not the only hurdle impairing Poland’s progress towards a successful unconventional gas program. According to Pawel Poprawaw, geologist at the AGH University of Science and Technology in Krakow, governmental red tape is largely to blame for the lack of significant drilling in Poland.¹⁰⁷ For example, it takes an average of eight months to secure a permit to drill in Poland, whereas the average in Pennsylvania is forty-five days.¹⁰⁸ Furthermore, wells in places like Poland and China cost around \$25 million to drill, as compared to \$5 million in the United States.¹⁰⁹ Without addressing regulations and procedures that are currently in place, Poland may have to continue its reliance on Russian sources of energy.

3. China

As the world’s most populous nation and highest energy consumer, China has begun to search for ways to diversify its energy portfolio.¹¹⁰ China currently relies on coal for over 70% of its energy needs.¹¹¹ Together, the United States and China account for more than 40% of global greenhouse gas emissions.¹¹²

In October 2013, China released the *First Shale Gas Industrial Policy*.¹¹³ Under the five-year plan, China set an ambitious goal of developing 230 billion cubic feet (bcf) of annual shale gas production by 2015.¹¹⁴ The plan also called for a two-year appraisal of China’s shale gas reserves, an increase in China’s expertise on shale gas technologies, and the development of a regulatory framework.¹¹⁵

China currently ranks first globally in terms of technically recoverable shale gas reserves, with Argentina placing second and the United States coming in at

103. *Poland Overview*, *supra* note 36.

104. Strzlecki & Almeida, *supra* note 102.

105. Scheck & Williams, *supra* note 7.

106. *Id.*

107. Strzlecki & Almeida, *supra* note 102.

108. *Id.*

109. Scheck & Williams, *supra* note 7, at B2.

110. U.S. Energy Info. Admin., *China Overview*, U.S. DEP’T OF ENERGY, <http://www.eia.gov/countries/cab.cfm?fips=CH> (last updated Feb. 4, 2014).

111. *Id.*

112. John Kerry, Op-Ed., *Sec. Kerry: Getting the U.S.-China Climate Partnership Right*, THINK PROGRESS (July 19, 2013, 1:05 PM), <http://thinkprogress.org/climate/2013/07/19/2328571/sec-kerry-getting-the-us-china-climate-partnership-right/>.

113. Tom Deegan et al., *China’s First Shale Gas Policy* (Nov. 12, 2013), <http://www.lexology.com/library/detail.aspx?g=2d0744b0-827d-473d-b511-857dd50137a8>.

114. *Id.*

115. *Id.*

fourth.¹¹⁶ China is estimated to have reserves that rival those of the United States and Canada combined.¹¹⁷ But there are many obstacles for China to overcome. For example, most of China's shale reserves are located in the earthquake-prone and mountainous southwest or in the arid deserts in the western portions of the country.¹¹⁸ These reserves are also located much further beneath the surface than typical U.S. reserves.¹¹⁹ It also takes much longer to drill in China than it does in the United States. The first horizontal well drilled by the Chinese company, PetroChina, took eleven months to drill compared to the typical two-week timeframe in the United States. Additionally, water scarcity concerns have led to public protests against fracking in the villages of China where farming employs many citizens.¹²⁰

Some believe China may be moving too quickly with its development and that this will result in accidents. Possible evidence of this occurred in April 2013, when an explosion at one of Sinopec's wells rocked the village of Jiaoschezen.¹²¹ The villagers claim that eight people were killed in the explosion, but Sinopec (one of China's energy giants) claims the explosion was nothing more than natural gas being flared.¹²² According to some, Sinopec instructed the villagers not to talk about the incident.¹²³

Despite these concerns, Secretary of State Kerry has frequently stated that a partnership between the two nations is necessary to put the world on a path to a clean energy future. "Revolutionizing the way we use and produce energy can be a 'win, win, win'—a win for America, a win for China, and win for the world."¹²⁴

While China has turned to foreign investors and international organizations/programs such as UGTEP¹²⁵ to provide the necessary technical and regulatory training to fully develop their unconventional gas supplies, as of 2012, a full year into the latest five-year shale gas development plan, China had drilled fewer than 100 shale gas wells.¹²⁶

116. TECHNICALLY RECOVERABLE SHALE OIL AND SHALE GAS RESOURCES, *supra* note 39.

117. Katie Hunt, *China Faces Steep Climb to Exploit Its Shale Riches*, N.Y. TIMES (Sept. 30, 2013), http://www.nytimes.com/2013/10/01/business/energy-environment/china-faces-steep-climb-to-exploit-its-shale-riches.html?pagewanted=all&_r=0.

118. *Id.*

119. Keith Bradsher, *China Takes on Big Risks in its Push for Shale Gas*, N.Y. TIMES (Apr. 11, 2014), http://www.nytimes.com/2014/04/12/business/international/china-takes-on-big-risks-in-its-push-for-shale-gas.html?_r=0. This is part of the reason why the average well in China costs approximately \$25 million to drill, compared to \$5 million in the United States. Scheck & Williams, *supra* note 7, at B2.

120. *Id.* During the 2014 U.N. Climate Summit held in New York, Robert Ichord, Deputy Assistant Secretary for the State Department's Bureau of Energy Resources, indicated that these geological, water, and infrastructure challenges may make natural gas an expensive option for China. Robert Ichord, Dep'y Asst. U.S. Sec'y of State & Richard Ottinger, Founder Energy & Climate Ctr.- Pace Univ., Innovations in Energy and Sustainable Energy for All, Address at the U.N. Climate Change Summit (Sept. 24, 2014).

121. Bradsher, *supra* note 119.

122. *Id.*

123. *Id.*

124. Kerry, *supra* note 112.

125. According to State Department sources, UGTEP and China remain actively committed to helping China develop its unconventional resources. Some of the current focus of that relationship is on sharing information related to environmental protection and regulation and developing best practices for tendering contracts with international companies.

126. *China's First Shale Gas Policy*, *supra* note 113.

4. India

Twenty-five percent of the population in India lacks access to electricity.¹²⁷ The parts of the nation that do have electricity experience rolling blackouts.¹²⁸ India relies largely on imported crude oil from the Middle East as well as coal for its energy needs.¹²⁹ Many Indian business leaders have encouraged domestic exploration and production of shale gas as a way to create jobs, reduce reliance on foreign oil, and stabilize the financial market.¹³⁰

There may also be environmental benefits in reducing India's coal and oil consumption. According to the latest Intergovernmental Panel on Climate Change (IPCC) report, India now ranks third amongst the world's top carbon polluters.¹³¹ The United States ranks second with China coming in as the top carbon emitter in the world.¹³²

In 2009, the United States and India entered into a Memorandum of Understanding on clean energy, energy efficiency, energy security, and climate change.¹³³ Since that time, UGTEP has promoted unconventional gas development in India by hosting a delegation from the Ministry of Petroleum and Natural Gas in the United States and by sponsoring a workshop in New Delhi in 2013.¹³⁴ Furthermore, UGTEP has funded a tight gas and shale oil resource assessment in India.¹³⁵

Despite this collaboration, to date, unconventional shale gas development has been slow in India.¹³⁶ One of the biggest hurdles for India is concern about water scarcity and quality. Not only does fracking require huge amounts of water to complete, but there are also concerns that fracking can result in contaminated water supplies.¹³⁷ In a nation as densely populated as India, further reductions in water availability (and quality) could have catastrophic impacts on many people.

127. U.S. Energy Info. Admin., *India Overview*, U.S. DEP'T OF ENERGY, <http://www.eia.gov/countries/cab.cfm?fips=IN#note> (last updated June 26, 2014).

128. *Id.*

129. *Id.*

130. Victor Mallet, *India's Growing Dependence on Energy Imports Raises Concern*, FINANCIAL TIMES (Sept. 13, 2013), <http://www.eastonline.eu/it/asia/india/india-s-growing-dependence-on-energy-imports-raises-concern>.

131. *U.N. Report Details Sources of Global Carbon Emissions*, USA TODAY (Apr. 11, 2014), <http://www.usatoday.com/story/news/2014/04/11/united-nations-climate-change-carbon-emissions/7593019/>.

132. *Id.*

133. ABBAS A. AKHIL ET AL., U.S.-INDIA CLEAN ENERGY DEPLOYMENT CENTER ASSESSMENT (2010), available at <http://www.pace-d.com/wp-content/uploads/2012/08/Annexure%201%20Assessment%20report%20for%20Clean%20energy%20centre,%20EE%20and%20RE.pdf>.

134. Press Release, Consulate Gen. of the U.S., Mumbai India, U.S.-India Fact Sheets – Health, International Security, Cultural Cooperation, Trade & Investment, Sustainable Growth & Energy & Climate Change (June 24, 2013), <http://mumbai.usconsulate.gov/fs062513.html>.

135. *Id.*

136. According to the State Department, it remains committed to helping India develop its unconventional resources. India is currently in the process of developing its regulations for unconventional development and is slated to conduct a bid run in the coming months. However, the political situation in India has stalled much of the active participation of that nation in UGTEP for the time being.

137. According to the International Energy Agency (IEA), 15% of the world's freshwater withdrawals each year are for energy production. "To put it another way, the energy sector withdraws water at approximately the same rate that water flows down the Ganges (in India) or Mississippi (in the United States) Rivers—some of the

India and the other nations discussed above are involved in various stages of cooperation with the United States for support in developing their unconventional shale gas programs. The following sections argue that technology transfer, social license, and a NEPA-like analysis should guide the decisions and partnerships formed under UGTEP.

IV. INFORMAL MECHANISMS FOR ENSURING RESPONSIBLE ADMINISTRATION OF UGTEP

One of the key aspects of UGTEP is fostering the transfer of technologies such as hydraulic fracturing and horizontal drilling to other nations. This transfer occurs via workshops, seminars, and hands-on training. For example, in May 2013, the State Department and Indonesian Ministry of Energy and Mineral Resources hosted a regional workshop in Jakarta, Indonesia.¹³⁸ Organized by the Department of the Interior-International Technical Assistance Program, topics included: market analysis, natural gas pricing policy, creating an East Asia gas hub, Indonesia's gas transportation and distribution infrastructure, financing infrastructure, geological assessments and analysis, technology innovation in drilling and hydraulic fracturing, as well as various environmental presentations.¹³⁹

Because UGTEP was formed as a collaboration between private industry players and government entities, the transfer of these technologies via UGTEP-facilitated projects could potentially impact the U.S. economy and foreign relations. Recall the 1984 Bhopal disaster in which an American company was responsible for exposing thousands of people to lethal gas.¹⁴⁰ Now imagine what would happen if an Indian company, trained by the United States government and industry, were to decide it is cheaper to dump fracking fluid and other production waste in the Ganges than to pay for proper disposal. Instead of having a single company to blame, India and the rest of the world could make an argument that the United States itself was at least partially liable.

This is why the United States must work to ensure that programs like UGTEP are administered in a way that protects the people and places where drilling will occur. While UGTEP is actively engaged in the transfer of technologies to foreign nations, more can be done to ensure that unconventional shale gas development

very largest in the world." *Water for Energy*, INT'L ENERGY AGENCY, <http://www.worldenergyoutlook.org/resources/water-energy-nexus/#d.en.34418> (last updated May 6, 2014).

138. *USACEP: Changing Global Gas Market and Unconventional Gas*, U.S. DEP'T OF INTERIOR, <http://www.doi.gov/intl/itap/ugtep-jakarta.cfm> (last visited May 6, 2014).

139. *Id.*

140. Hanson Hosein, *Unsettling: Bhopal and the Resolution of International Disputes Involving an Environmental Disaster*, 16 B.C. INT'L & COMP. L. REV. 285, 285 (1993) (describing Bhopal as the single worst industrial accident in history). Union Carbide, a Danbury, Connecticut company, owned 50.9% share in its Indian subsidiary, Union Carbide India Limited (UCIL). UCIL told local villagers that the plant was manufacturing a gas that could make them sick, but could not kill them. However, a leak of methyl isocyanate gas resulted in the deaths of over 3,800 people and injured over 200,000.

[Bhopal] is now a convenient one-word description that evokes many disconcerting thoughts in the collective memory of the developed world: the liability of a transnational corporation, the transfer of a hazardous technology to a developing country, and the jurisdiction of national courts with regards to an issue that defies borders.

Id.

proceeds safely. This can be achieved by sharing environmentally-sound technologies and through active engagement with the communities where unconventional development will occur. The following section discusses how the transfer of environmentally-sound technologies could help ease some of the opposition to the U.S.-led global expansion of unconventional shale development.

A. Technology Transfer and the United States' Role in Global Expansion of Unconventional Gas Development

Technology transfer is a complex concept with no set definition or method.¹⁴¹ Loosely speaking, it encompasses the idea that developed nations have a duty to share technologies with developing nations. While no precise definition has been agreed upon, most agree that it must include a functional component whereby the recipient country is able to manufacture products comparable in quality to those manufactured by the technology supplier.¹⁴²

Technology transfer typically occurs through the transfer of machinery or other goods, via individual experts, and by sharing technical “know-how.”¹⁴³ But technology transfer is not simply a series of technicalities. Rather, it is guided by the economics, politics, social circumstances, and culture “that shape the significance attached to possessing knowledge of some thing or method, and of selling or transferring such knowledge to another for the recipient’s presumed benefit and for the seller’s anticipated profit.”¹⁴⁴

The reason the United States is the global leader in unconventional shale gas production is directly tied to its innovation in drilling and hydraulic fracturing technology. As the oil and gas companies are quick to point out, hydraulic fracturing is not technically a “new” invention.¹⁴⁵ In fact, federal funding helped pay for the research and development that eventually led George Mitchell and his team to perfect the fracking process, which changed the energy game in the United States.¹⁴⁶ It is the desire to acquire these technologies that led foreign nations to seek the assistance of the United States and UGTEP.

But beyond the general customary law of technology transfer, the United States is also a party (or signatory) to various treaties governing climate change and the transfer of environmentally-sound technologies (ESTs).

[T]echnology innovation is a crucial component of energy transformation and sustainability, but to be most effective we cannot pursue innovation with abandon. . . . Innovation for energy sustainability must therefore include optimization of our

141. David M. Haug, *The International Transfer of Technology: Lessons that East Europe Can Learn from the Failed Third World Experience*, 5 HARV. J.L. & TECH. 209, 210 (1992).

142. *Id.* at 212.

143. *Id.* at 213.

144. Wolfgang Fikentscher & Hans Peter Kunz-Hallstein, *International Transfer of Technology: A Perspective on the Roles of Antitrust, Competition Law, and Trade*, 9 DEL. L. REV. 37, 37 (2006).

145. *History of Hydraulic Fracturing*, FRACFOCUS, <https://fracfocus.org/hydraulic-fracturing-how-it-works/history-hydraulic-fracturing> (last visited Jan. 30, 2015).

146. *The Father of Fracking: Few Businesspeople Have Done as Much to Change the World as George Mitchell*, THE ECONOMIST (Aug. 3, 2013), <http://www.economist.com/news/business/21582482-few-businesspeople-have-done-much-change-world-george-mitchell-father>.

existing energy systems, so that the technologies of today can be used more efficiently, reliably, cleanly, and economically.¹⁴⁷

In 1992, the U.N. Conference on Environment and Development (UNCED) was held in Rio de Janeiro, Brazil.¹⁴⁸ The purpose of this “Earth Summit” was to “elaborate strategies and measures to halt and reverse the effects of environmental degradation in the context of strengthened national and international efforts to promote sustainable and environmentally sound development in all countries.”¹⁴⁹ During the summit, the participating nations came up with a series of global climate change agreements—among them the U.N. Framework Convention on Climate Change (UNFCCC).¹⁵⁰ While the UNFCCC did not set specific limits on greenhouse gas emissions, it did include a provision for updates, called protocols.¹⁵¹

The Kyoto Protocol, held in December 1997, set binding levels on developed nations, but set no such limit on developing nations.¹⁵² Therefore, developing nations such as China and India, among the world’s largest emitters of greenhouse gases, were not bound to reduce emissions, while the United States, had it chosen to ratify the Kyoto Protocol, would have been.

While the United States has never ratified the Kyoto Protocol,¹⁵³ it has ratified the UNFCCC. Some of the reasons given for this reluctance to ratify the Kyoto Protocol are that it sets unrealistic emissions standards, is ineffective in reaching the 68% reduction in human emissions that scientists believe are necessary to reverse the effects of global warming,¹⁵⁴ and it allowed developing nations to participate in the negotiations but did not bind them under the treaty.¹⁵⁵ Additionally, President Bush felt that ratification of the protocol would increase domestic energy prices.¹⁵⁶

Three additional non-binding instruments emerged from UNCED: the Rio Declaration on Environment and Development; a Non-Legally Binding Authoritative Statement of Principles for a Global Consensus on the Management, Conservation and Sustainable Development of All Type of Forests; and Agenda 21.¹⁵⁷

147. Avi Gopstein, Senior Technical Advisor to Ambassador Pascual, U.S. Dep’t of State, Remarks at the Czech-U.S. Sustainable Energy Conference: Innovation in Sustainable Energy (Sept. 20, 2012).

148. PHILLIPE SANDS & JACQUELINE PEEL, PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW (Cambridge Univ. Press, 3d ed. 2012).

149. *Id.* at 40.

150. Sarah A. Peay, *Joining the Asia-Pacific Partnership: The Environmentally Sound Decision?*, 18 COLO. J. INT’L ENVTL. L & POL’Y 477, 490 (2007).

151. *Id.*

152. *Id.* at 491.

153. *Id.* at 480.

154. *Id.* at 481.

155. *Id.*

156. Nicole Buckoski, *The Future of Domestic Climate Law: Tracing the United States’ Adherence to Kyoto in Pending Federal Climate Change Legislation*, 14 GONZ. J. INT’L L. 4 (2010-11).

157. Sands, *supra* note 148, at 41.

Under Agenda 21, the international community committed to assisting least-developed countries and small island nations.¹⁵⁸ Of particular importance in Agenda 21 is Chapter 34, entitled “Transfer of Environmentally Sound Technology, Cooperation and Capacity-Building.”¹⁵⁹ Agenda 21 defines EST as technologies that, “protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual wastes in a more acceptable manner than the technologies for which they were substitutes.”¹⁶⁰ Chapter 34 of Agenda 21 also calls for the transfer of ESTs to developing nations through supportive measures “that should enable transfer of necessary technological know-how as well as building up of economic, technical, and managerial capabilities” related to the transferred technology.¹⁶¹

Today, technological advancements in oil and gas drilling technology and fracking eclipse the development of ESTs.¹⁶² But as the most innovative nation on the planet, this does not have to be an “either/or” decision. For example, in November 2012, the Joint Institute for Strategic Energy Analysis, an arm of the U.S. National Renewable Energy Lab (NREL), issued an executive report entitled, “Natural Gas and the Transformation of the U.S. Energy Sector: Electricity.”¹⁶³ The report found that life cycle greenhouse gas emissions associated with electricity production from unconventional natural gas were similar to emission levels from conventional gas. However, the levels for unconventional gas were less than half of those from coal-fired electricity generation.¹⁶⁴ Still, when natural gas is flared during shale gas extraction, significant amounts of greenhouse gases are released into the atmosphere.

The NREL, located in Golden, Colorado, is currently working on project that promises to reduce GHG emissions resulting from flaring methane during fracking operations. Scientists are developing microbes capable of ingesting and converting methane into non-phosphorus-based lipids that can then be converted into liquid diesel fuel.¹⁶⁵ According to NREL, approximately \$12 billion dollars of lost revenue occurs each year in the United States as a result of methane flaring during fracking.¹⁶⁶ This provides strong support for the idea that developed

158. Elizabeth Burleson, *From Coase to Collaborative Property Decision-Making: Green Economy Innovation*, 14 TUL. J. TECH. & INTELL. PROP. 79, 104 (2011).

159. United Nations Conference on Environment and Development, Rio de Janeiro, Braz., June 3-14, 1992, *Agenda 21, Chapter 34*, U.N. Doc. A/CONF.151/26 (Vol. 1), Annex 2, available at <http://www.un-documents.net/a21-34.htm>.

160. *Id.*

161. *Id.*

162. Burleson, *supra* note 158, at 102.

163. U.S. DEP'T OF ENERGY, NATIONAL RENEWABLE ENERGY LAB, JOINT INST. FOR STRATEGIC ENERGY ANALYSIS, NREL/TP6A50-57702, EXECUTIVE SUMMARY—NATURAL GAS AND THE TRANSFORMATION OF THE U.S. ENERGY SECTOR: ELECTRICITY (2013).

164. *Id.* at 2.

165. *NREL Working to Clean Air in Fracking Process*, NREL (Jan. 16, 2014), http://www.nrel.gov/news/features/feature_detail.cfm/feature_id=7300.

166. *Id.* The NREL microbe project is backed by a \$4.8 million award from ARPA-E. “ARPA-E is an innovative and collaborative government agency that brings together America’s best and brightest scientists, engineers, and entrepreneurs.” ARPA-E, <http://arpa-e.energy.gov> (last visited Jan. 16, 2014). “The America COMPETES Act of 2007 authorized the establishment of ARPA-E within the U.S. Department of Energy. However, ARPA-E did not officially come into existence until early 2009, when it received \$400 million in

nations should share these types of ESTs with developing nations. Developing nations may be more receptive to the U.S.-led shale gas development efforts if there were technologies available to ensure maximum profits and reduced GHG emissions could be achieved from unconventional development.

What is unclear, however, is whether we have a duty, pursuant to our participation in the UNFCCC and other agreements, to share innovations like these with developing nations when the technology has the capability to help alleviate global issues such as climate change. While the question of “duty” is not easily answered, President Obama has indicated that the United States will work to ensure that technologies that can help combat global warming will be shared with other nations. At the U.N. Climate Summit held in New York in September 2014, the President announced a new executive order on Climate Resilience International Development that requires agencies to factor climate resilience into all international development work.¹⁶⁷ According to the White House, the new executive order will, among other things, ensure that funding decisions take climate resilience into account and will ensure that the United States “[s]hare[s] knowledge, data, tools, information, frameworks, and lessons learned in incorporating climate-resilience considerations.”¹⁶⁸

In addition to the transfer of technologies to nations seeking help with their unconventional development programs, UGTEP could work harder to collaborate with the people, not just governments, who have a stake in the issue of unconventional gas development.

B. Why Seeking a Social License is a Good Ethical—and Economic—Policy

A second informal mechanism for encouraging responsible expansion under UGTEP is a concept known as “social license.” Social license has been defined as the demands and expectations placed on a business or industry that come from neighborhoods, environmental groups, and members of surrounding communities.¹⁶⁹ Social license is neither a physical license nor a legal requirement, but instead is a theoretical license to conduct a particular activity in relative harmony with local communities and stakeholders.¹⁷⁰ Often, the demands placed on industry by these “licensors” can be more stringent than the laws or regulations governing a particular activity.¹⁷¹

Failure to seek a social license can lead to reputational disasters. As a result, social license has become a risk management strategy and can help explain “why, in what circumstances, and to what extent corporations may choose to go beyond

funding through the American Recovery and Reinvestment Act.” *General Questions*, ARPA-E, <http://arpa-e.energy.gov/?q=faq/general-questions> (last visited Jan. 16, 2014). The focus of this program is securing the United States’ position as lead global technology innovator.

167. Press Release, The White House, Office of the Press Sec’y, President Obama Announces New Actions to Strengthen Global Resistance to Climate Change and Launches Partnerships to Cut Carbon Pollution (Sept. 23, 2014).

168. *Id.*

169. Neil Gunningham et al., *Social License and Environmental Protection: Why Businesses Go Beyond Compliance*, 29 *LAW & SOC. INQUIRY* 307, 308 (2004).

170. House, *supra* note 15, at 51.

171. Gunningham, *supra* note 169, at 308.

compliance with their existing legal obligations.”¹⁷² This means it makes good economic sense to seek a social license to operate.

While many industries have contributed to and felt the ramifications of public mistrust in the past, the oil and gas industry has been the focus of particularly harsh and widespread criticism both in the United States and overseas. “The international community is witnessing an energy revolution that has taken on a manic degree of intensity at a time that such a drive can, and should, be similarly directed towards addressing climate destabilization in a humanitarian manner.”¹⁷³ Extraction of natural resources naturally results in impacts on the physical landscape, but additionally, “extraction on public lands for individuals and disadvantaged communities—be it Papua New Guinea mining without clear land title, or hydraulic fracturing without lengthy scientific documentation of groundwater effects” can have significant impacts on the people living there.¹⁷⁴

There are countless examples of government and industry failing to engage with communities affected by development plans.¹⁷⁵ This can lead to backlash from not only the local community, but other watchdog organizations as well. The benefits of seeking a social license to operate can include greater acceptance of development activities by communities, which naturally results in fewer protests and other obstacles for the group wanting to develop in a particular area.

Some believe industry itself bears responsibility for the social mistrust surrounding fracking.¹⁷⁶ For example, oil and gas operators in the United States have routinely fought against regulations requiring the disclosure of the chemicals used in fracking fluid.¹⁷⁷ Further, intense lobbying efforts on the part of the oil and gas industry have led to exemptions from several federal environmental laws. For example, with the enactment of the Energy Policy Act of 2005, Congress exempted hydraulic fracturing from the Safe Drinking Water Act.¹⁷⁸ In order to ease this mistrust, and to earn a social license to operate, the industry must work towards transparent operational practices, engage with the affected communities to ease their fears, and work to further develop more ESTs and business practices.¹⁷⁹

Seeking a social license to operate can be especially useful in places like India where environmental activists are “becoming more strident, contributing to the evolution of environmental policy and legislation, monitoring for violations of

172. *Id.* at 309.

173. Burleson, *supra* note 158, at 102.

174. *Id.* at 100.

175. *See, e.g., Texaco and Ecuador*, N.Y. TIMES (Feb. 19, 1999), <http://www.texaco.com/sitelets/ecuador/en/history/> (detailing a lawsuit filed by indigenous people of the Amazon after massive amounts of contamination to the soil and water were left behind by Texaco after drilling for oil); *see also* Matthew F. Smith & Naing Htoo, *Energy Security: Security for Whom?*, 11 YALE HUMAN RIGHTS & DEV. L.J. 217 (2008) (detailing human rights abuses ties to various natural gas projects in Myanmar).

176. House, *supra* note 15, at 7.

177. *See, e.g., U.S.: Disclose Fracking Chemicals on Public Land*, USA TODAY (May 16, 2013), <http://www.usatoday.com/story/money/business/2013/05/16/fracking-rules-disclosure/2173837>.

178. 42 U.S.C. § 15801 (2005).

179. House, *supra* note 15, at 7.

those measures and partnering with businesses to create industry standards and codes of conduct.”¹⁸⁰

As an example, in 2012, the South Korean company, Posco, agreed to build a steel plant in India at a cost of \$12 billion.¹⁸¹ This was set to be the largest single foreign investment in the country in over eight years.¹⁸² However, opposition from local citizen groups made it nearly impossible for the company to acquire the necessary land for the project.¹⁸³ While Posco did eventually receive the required environmental permit to build the plant, the project continues to face protests by local residents who have successfully drawn enough attention to the matter for the Indian Supreme Court to step in and remove permitting power from the Ministry of Environment and Forests.¹⁸⁴

One of the areas where the growing environmental movement in India has intervened is “when corruption or lack of enforcement has led to disregard of laws and regulations, as in the case of many well-documented mining projects.”¹⁸⁵ Much like citizen-suit provisions found in several U.S. environmental laws, Indian courts allow “public interest litigation.”¹⁸⁶ However, unlike the rules governing standing in U.S. citizen suits, in India, any member of the public can file a petition for a court to hear a case—even when they are not directly affected by a particular action.¹⁸⁷ The reason for this is the concept that every citizen has an inalienable right to a clean and healthy environment.¹⁸⁸ Furthermore, in India, it is recognized that the government has a responsibility to protect the environment.¹⁸⁹

In regard to conducting business in places like India, some have suggested that inviting objections or reactions from authorities and the public, involving local authorities and the public in development activities, and educating/informing citizens¹⁹⁰ about the benefits of a project can protect businesses from large investment losses.¹⁹¹ “A social license to operate an activity as strategic and volatile as natural gas extraction can best be accomplished in combination with a robust environmental and public health framework that balances energy and equity at local, regional, and international levels.”¹⁹²

While soft-law concepts such as technology transfer and social license can help guide programs like UGTEP, they may not be enough to guarantee the

180. Madhur Singh, *Indian Environmental Activists Up the Ante As Government Struggles to Enforce Rules*, BLOOMBERG BNA INT’L ENV’T REPORTER, 36 INER 1723 (Dec. 12, 2013).

181. *Id.*

182. *Id.*

183. *Id.*

184. Madhur Singh, *New Environment Minister’s Pro-Business Stance Worries Indian Advocacy Groups*, 37 INER Issue No. 03, 141, 208 (Jan. 17, 2014).

185. Singh, *supra* note 180.

186. *New Environment Minister’s Pro-Business Stance*, *supra* note 184.

187. Singh, *supra* note 180.

188. *Id.*

189. *Id.*

190. *But see* Nicholas A. Fromherz, *From Consultation to Consent: Community Approval as a Prerequisite to Environmentally Significant Projects*, 116 W. VA. L. REV. 109, 148-53 (2013) (arguing that community consent, rather than consultation, would help ensure that the environmental impact of a project would give a meaningful say to those with a large stake in the outcome of the project - the local community).

191. Nicholas A. Robinson et al., *COMPARATIVE ENVTL. LAW & REGULATION* § 28:21 (2012).

192. Burleson, *supra* note 158, at 103.

protection of those people and places where drilling will take place. Therefore, formal mechanisms may be necessary to ensure minimal social and environmental impacts resulting from U.S.-led unconventional gas development in foreign nations. The following section discusses the benefits of requiring a NEPA-like analysis for UGTEP projects.

V. APPLYING A NEPA-LIKE ANALYSIS TO ENSURE RESPONSIBLE ADMINISTRATION OF UGTEP

In 1970, Congress passed the National Environmental Policy Act (NEPA) requiring federal agencies to produce an environmental impact statement for “major Federal actions significantly affecting the quality of the human environment.”¹⁹³ Congress recognized the “profound impact of man’s activity on . . . the natural environment” resulting from, among other things, resource exploitation and technological advances.¹⁹⁴ Further, Congress declared it to be the policy of the federal government “to use all practicable means and measures, including financial and technical assistance . . . to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.”¹⁹⁵

A. *Does NEPA Apply to UGTEP-Related Projects Outside of the United States?*

For actions taken by the United States overseas, there is a presumption against extraterritorial application of federal legislation.¹⁹⁶ However, there have been instances where courts have applied federal statutes, such as NEPA, extraterritorially.¹⁹⁷ For example, in *Environmental Defense Fund v. Massey*,¹⁹⁸ the Environmental Defense Fund sued the National Science Foundation (NSF) over its plans to incinerate food waste produced at the McMurdo Station research facility located in Antarctica.¹⁹⁹ The NSF argued that NEPA did not apply because the trash burning was occurring in Antarctica and not within the United States.²⁰⁰

193. 42 U.S.C. § 4332(C) (1969).

194. 42 U.S.C. § 4331(a) (1969).

195. *Id.*

196. *American Banana Co. v. United Fruit Co.*, 213 U.S. 347, 357 (1909) (holding all federal legislation is *prima facie* territorial).

197. In addition to court-sanctioned extraterritorial application of NEPA, at least one case, *Friends of the Earth, Inc. v. Watson*, Civ. No. 02-4106, (N.D. Cal. 2005), resulted in a pre-trial settlement where the parties agreed to apply NEPA to overseas projects. In *Watson*, Friends of the Earth and several U.S. cities sued the United States Export-Import Bank (the Bank) for its continued funding of international fossil fuel related projects without conducting a NEPA analysis to determine the global effects of the greenhouse gas emissions of those projects. The Plaintiffs argued that even though the projects occurred outside the United States, they had substantial impacts on U.S. citizens as a consequence of the substantial amount of resulting greenhouse gas emissions. This was the first time plaintiffs had been granted standing based solely on the effects that global warming has on individual people and locations. After seven years, the parties agreed to a settlement. The Export-Import Bank agreed to evaluate carbon dioxide emissions information before determining whether to approve loans for fossil fuel projects. Additionally, the Bank agreed to establish a \$250 million facility that will offer the Bank’s full range of financial products in order to promote renewable energy products. *Id.*

198. 986 F.2d 528 (D.C. Cir. 1993).

199. *Id.* at 529.

200. *Id.* at 530.

The D.C. Circuit Court of Appeals overturned the district court's determination that despite the broad congressional language contained in NEPA, the presumption against extraterritorial application applies when the statute lacks "a clear expression of legislative intent through a plain statement of extraterritorial statutory effect."²⁰¹ The court of appeals held that when the conduct complained of occurs primarily, if not entirely, within the United States, though the effect of the conduct will be felt outside the United States, the presumption against extraterritorial application of the statute does not apply.²⁰²

Much like the facts in *Massey*, the UGTEP program is administered from within the United States. The State Department, in conjunction with various other federal entities, oversees the program and coordinates conferences, seminars, meetings, workshops, contract bidding, and other details from Washington D.C. Furthermore, there are many instances where foreign nations attend training sessions and other meetings in the United States. The first Global Shale Gas Initiative Conference, for example, was held in Washington, D.C. and included a field trip to Pennsylvania.²⁰³ Accordingly, under *Massey*, the federal courts could find that NEPA requires environmental assessments (and environmental impact statements if the activity meets the requisite criteria) for activities associated with UGTEP.

B. *The Benefits of Requiring a Co-Authored NEPA-Like Analysis*

The implications of requiring a detailed environmental assessment or environmental impact statement in an industry already nervous about investments in places with burdensome regulations, market conditions, and unsteady political systems could be enormous. The President has made it clear that one of his Administration's top priorities is to expand unconventional gas development globally to enhance energy security as well as climate security. Therefore, in order to achieve these goals and to protect the people and places where drilling will occur, the United States should require a modified NEPA-like analysis before U.S. companies benefitting from UGTEP-related contracts are allowed to participate in unconventional shale gas exploration and production overseas.

NEPA applies to actions taken by the federal government, not private industries. However, this article suggests that private industry participants (as well as government agencies) engaging in exploration and development of unconventional shale resources in foreign nations should be required to ensure that these activities are conducted in a way that minimizes environmental impacts in foreign nations.²⁰⁴ One way of meeting this goal is through the use of a NEPA-like analysis.

201. *Id.* at 529.

202. *Id.* *But see* *Basel Action Network v. Mar. Admin.*, 370 F. Supp. 2d 57, 71-78 (D.D.C. 2005) (holding that despite the ruling in *Massey*, the United States does not have legislative control over the high seas; therefore NEPA did not apply to the trans-Atlantic towing of dead ships).

203. Goldwyn, *supra* note 14.

204. Many international projects involve partnerships between government and private industry. For example, between 2008 and 2009, the Bureau of Reclamation conducted consultations with Mexico via the International Boundary and Water Commission, regarding the implementation of a pilot run of the Yuma Desalting Plant (YDP). Despite the fact that the YDP is located within the United States (4,000 feet from the northern Mexican border), the operation of the YDP would affect the salinity of United States water deliveries

A modified NEPA-like analysis would require the State Department (or another federal agency) to first determine whether significant environmental impact is likely to occur from drilling in a particular location. Second, when this question is answered in the affirmative, any U.S. company participating in UGTEP should be required to produce an environmental impact statement or an assessment of the potential environmental impacts. This would involve soliciting comments from potentially affected individuals living or working within the area of the proposed drilling site. Any claim of infringement on a state's sovereignty resulting from the investigative work necessary to complete the analysis could be resolved by requiring nations participating in UGTEP to consent to these activities.

Alternatively, the State Department could co-author the environmental assessment with the participating nation. This would avoid the issue of infringing on another nation's sovereignty. This could also act as a checks and balances-type system where the participating nation could ensure that the U.S. company was doing everything possible to protect the nation's environment and citizens. It could also help ensure that foreign corruption does not lead to dangerous shortcuts in the exploration and production of shale gas.

Implementation of a modified NEPA-like analysis would not only aid U.S. companies in gaining a social license to operate overseas, but it would also help assure the American public, financiers of the UGTEP program, that their money is not being spent in a way that will harm people in other parts of the world.

VII. CONCLUSION

The Shale Gas Revolution, and the resultant position of the United States as global leader in unconventional shale gas development, has created significant political and economic opportunities for the United States. On the one hand, programs like UGTEP have the potential to advance the Obama Administration's climate-reduction strategies, to help our allies obtain energy security, and to ensure American companies are able to capitalize on the technology, knowledge, and experience gained over the last decade. That is, everyone has the potential to win if UGTEP is done right. On the other hand, if the United States is going to share the technology and know-how necessary to develop foreign sources of shale gas, it must ensure that it does so in a responsible manner.

Consider the political, diplomatic, and economic ramifications that would result from a large-scale environmental disaster occurring in a place like India or China where water scarcity and quality issues abound. If UGTEP fails to ensure that nations do not institute the proper regulatory framework to ensure the safe production of its shale gas resources, would the United States government, or a U.S. company operating under such flawed regulation, be liable for the loss of life or property resulting from gas development activities?

to Mexico. Though NEPA does not require assessment of environmental impacts occurring within a foreign nation, in an effort to enhance bi-national cooperation, a series of consultations occurred between not only the Bureau of Reclamation and Mexico, but non-governmental environmental organizations as well. BUREAU OF RECLAMATION, U.S. DEP'T OF THE INTERIOR, YUMA DESALTING PLANT PILOT RUN FINAL REPORT (2012), available at <http://www.usbr.gov/lc/yuma/facilities/ydp/YDPPilotRunFinal072712.pdf>.

Some companies, such as Shell, have already taken note of the benefits to engaging in a consultative process with the communities surrounding its various oil and gas projects.²⁰⁵ When locals in a Philippine village expressed concern about a proposed pipeline and its effect on biodiversity, Shell looked for alternative routes. “Did Shell do this out of the kindness of its heart? Probably not. Instead, Shell perceived the alignment between fiscal, environmental, and social responsibility.”²⁰⁶ Other companies engaged in UGTEP can, and should, follow this type of example.

There are many efforts underway to address climate change and global energy security issues.

It will take more than a single resource, a single technology, or a single policy action to achieve our long-term goals of energy security, sustainability, and economic progress. Improving the efficiency of our energy consumption, diversifying the energy sources we rely on, and advancing energy technologies are all critical to meeting overall energy needs.²⁰⁷

This paper has focused on a single program administered by the State Department with the hope that larger lessons may be learned concerning how the United States can share technologies with the rest of the world in a responsible manner that balances our economic, diplomatic, and environmental interests on a global-scale.

205. Fromherz, *supra* note 190, at 165.

206. *Id.*

207. Avi Gopstein, Senior Tech. Advisor to Ambassador Pascual, U.S. Dep’t of State, Remarks at the U.S. Sustainable Energy Conference: Innovation in Sustainable Energy, The Role of U.S. Technology Policy and Energy Diplomacy in Energy Transformation (Sept. 20, 2012).