OIL AND GAS EXPLORATION AND PRODUCTION IN THE GULF OF GUINEA: CAN THE NEW GULF BE GREEN?

> Much of the industrial world will find itself caught up in the competition of two great themes—energy and security, and energy and the environment. A far-reaching clash between anxieties about energy security and economic well-being on the one side, and fears about the environment on the other, seems all but inevitable.[1]

I. INTRODUCTION

Energy continues to be a key factor in the economic well-being of developed and developing countries. Developed countries have vast energy requirements that need to be fulfilled, while developing countries will continue to grow their energy demands as time goes by.[2] Oil continues to fulfill a large majority of these worldwide energy needs.[3] Estimates indicate

1. DANIEL YERGIN, THE PRIZE: THE EPIC QUEST FOR OIL, MONEY AND POWER 779 (1992).

2. *See* BP, BP STATISTICAL REVIEW OF WORLD ENERGY 2–3 (2008), http://www.bp.com/liveassets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2008/STAGING/local_assets/downloads/pdf/statistical_review_of_world_energy_full_review_2008.pdf. World primary energy consumption grew by 2.4% worldwide in 2007 despite the increased cost of energy. *Id.* at 2. Registering a 7.7% rise in energy consumption, China accounted for the majority of this growth. *Id.* Despite record high energy prices, North American energy consumption grew by 1.6%. *Id.*

3. *See id.* at 11–13 (illustrating the steady increase of oil consumption worldwide).

that the world oil consumption in 2006 was 85,220 thousand barrels per day, an increase of 1.1% from 2006.[4] This growing demand, coupled with OPEC's production cuts, almost ensures that exploration for oil will continue to be strong.[5] A lot of this oil exploration is expected to be offshore in water over 1,000 feet in depth.[6] Some consultants have suggested that undiscovered deepwater reservoirs around the world may contain as much as 181 billion barrels.[7]

The continued demand for oil means that the discovery of offshore oil in a developing country usually brings an economic bonanza for that country.[8] Still, past experience shows that in many cases this oil boom has translated into an improved life for only a select few and can actually leave the impoverished majority in worse shape than before.[9]

In addition to the economic and governmental challenges that an oil boom brings to a developing country, there are also environmental risks that must be addressed.[10] Regions made up of developing countries often do not have the resources and governmental structures required to create and manage a legal framework for the prevention of environmental harm from offshore oil and gas exploration and production (E & P) activities.[11]

This particular scenario is currently unfolding in the Gulf of Guinea.[12] The countries of the Gulf of Guinea, an area in the

4. *Id.* at 11.

5. *See id.* at 3 (describing rising demand in spite of OPEC's production cuts).

6. JOHN GHAZVINIAN, UNTAPPED: THE SCRAMBLE FOR AFRICA'S OIL 84–85 (2007).

7. *Id.* at 85.

8. *Id.* at 95.

9. Much has been written about the inequalities evidenced in some resource-rich developing countries. *See, e.g.*, Alice Farmer, *Towards a Meaningful Rebirth of Economic Self-determination: Human Rights Realization in Resource-Rich Countries***,** 39 N.Y.U. J. INT'L L. & POL. 417, 417–79 (2006); *see also* GHAZVINIAN, *supra* note 6, at 19 (describing unequal distribution of oil money in Nigeria and its effects and consequences).

10. *See infra* Part II; *see also* Kaniye SA Ebeku, *The Right to a Satisfactory Environment and the African Commission*, 3 AFR. HUM. RTS. L.J. 149, 156–59 (2003) (discussing how oil operations in the Niger Delta have resulted in severe environmental degradation).

11. *See infra* Part IV.

12. *See generally id.* (explaining how the environmental protection laws in the Gulf of Guinea are overly broad, idealistic, and lack enforcement mechanisms).

West and Central Africa coast made up of Nigeria, Chad, Cameroon, Equatorial Guinea, Angola, Sao Tome and Principe, Gabon, and Congo, are considered developing countries.[13] All of these countries are either currently producing offshore oil or are exploring for oil offshore.[14] However, the region currently lacks a comprehensive environmental protection plan to address offshore oil and gas exploration and production.[15] The aim of this paper is to suggest a regional framework for environmental protection during offshore E & P activities in the Gulf of Guinea. Part II of this paper discusses the benefits and challenges associated with offshore exploration and production, including the environmental risks. Part III discusses the Gulf of Guinea and its oil potential. Part IV discusses the existing international, regional, and national legal frameworks for environmental protection during offshore E & P activities. Part V suggests contents of a new regional protocol to address environmental issues related to offshore oil and gas E & P. Part VI discusses the obstacles to developing and implementing a new regional protocol. These suggestions can apply not only to the Gulf of Guinea, but to other regions of Africa or the globe that may see offshore oil exploration activity in the future.[16]

13. International Monetary Fund, World Economic Outlook Database Apr. 2008—WEO Groups and Aggregates Information, http://www.imf.org/external/pubs/ft/weo/2008/01/weodata/groups.htm#oem (last visited Feb. 8, 2009); *see also infra* Part III.

14. JAMES J. FORREST & MATTHEW V. SOUSA, OIL AND TERRORISM IN THE NEW GULF: FRAMING U.S. ENERGY AND SECURITY POLICIES FOR THE GULF OF GUINEA 13–14 (2006); *see also infra* Part III.

15. *See infra* Part IV.

16. Some authors suggest that oil exploration in offshore East Africa is to be expected. GHAZVINIAN, *supra* note 6, at 294–95. In addition to Africa, offshore oil exploration is ongoing (or is planned) in other regions of the world that lack a regional protocol or detailed framework for environmental protection during offshore oil extraction activities. *See, e.g.*, Caspian Environment Programme, Framework Convention Protocols, http://www.caspianenvironment.org/Newsite/Convention-Protocols.htm (last visited Feb. 8, 2009) ("[n]oting the need to establish a regional mechanism for effective cooperation and coordination in case of major oil spills . . .").

II. OFFSHORE E & P AND ITS ENVIRONMENTAL IMPACTS

Offshore E & P offers significant benefits over onshore oil production. For example, it minimizes the possibility of disruptions caused by violence and war.[17] It also provides the possibility of shipping oil directly to the major consumers (e.g., the U.S.) without having to bring the oil onshore to potentially volatile areas.[18] Currently, offshore production accounts for up to 30% of the world's oil and gas production.[19] That percentage is expected to rise in the future.[20]

However, offshore E & P activities are not without disadvantages. Offshore development, especially deepwater development, requires a significant technological investment.[21] In addition, offshore oil development brings some inherent environmental challenges.[22] It can be a significant threat to the marine environment and ecosystem.[23] Similar to onshore development, it creates atmospheric emissions.[24] Finally, after the oil has dried up, there is the significant challenge of what to do with abandoned platforms, i.e., decommissioning.[25]

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17. GHAZVINIAN, *supra* note 6, at 11; s*ee also* Jean-Christophe Servant, *The New Gulf Oil States*, LE MONDE DIPLOMATIQUE, Jan. 2003, at 19, *available at* http://mondediplo.com/2003/01/08oil (explaining how an offshore rig in Nigeria is insulated from political turmoil).

18. GHAZVINIAN, *supra* note 6, at 10; Alex Perry, *Africa's Oil Dreams*, TIME, May 31, 2007, at 22.

19. STANISLAV PATIN, ENVIRONMENTAL IMPACT OF THE OFFSHORE OIL AND GAS INDUSTRY 1 (Elena Cascio trans., EcoMonitor Publ'g 1999).

20. *See* GHAZVINIAN, *supra* note 6, at 85.

21. *Id.* at 14.

22. *See infra* Part III.

23. *Id.* Although Agenda 21 indicates that "offshore oil E & P activities generally account for a very small proportion of marine pollution[,]" it also calls for a "precautionary and anticipatory rather than a reactive approach" to degradation of the marine environment. United Nations Conference on Environment and Development, June 3–14, 1992, Agenda 21, paras. 17.20–21, U.N. Doc. A/CONF.151/26 (Aug. 12, 1992).

24. PATIN, *supra* note 19, at 84.

25. *See id.* at 99 (illustrating the many options for the disposal of offshore equipment).

In areas with significant resources such as the Gulf of Mexico or the North Sea, extensive regulatory frameworks have been required to mitigate these potential damages.[26] However, offshore development in developing countries may result in unmitigated environmental risks. For example, the countries of the "new Gulf"[27] have major challenges in regards to government, peace, wealth distribution, economy, health, and security,[28] such that environmental protection associated with offshore development may be only an afterthought. However, if nothing is done proactively, it may later be too late to reverse the environmental harm.[29] Thus, there exists a gap in regards to environmental protection related to offshore oil and gas E & P in the Gulf of Guinea.

26. *See* James E. Hickey, Jr., *Environmental Regulation of the Oil and Gas Industry in the U.S.A.*, in ENVIRONMENTAL REGULATION OF OIL AND GAS INDUSTRY 215, 215–18 (Zhiguo Gao ed., Kluwer Law Int'l 1998); Christopher Napier, *Directions in European and the United Kingdom Environmental Policy and Legislation*, in ENVIRONMENTAL REGULATION OF OIL AND GAS 259, 259–76 (Zhiguo Gao ed. 1998).

27. "New gulf" has been used by several authors to refer to the Gulf of Guinea. *See, e.g.*, Servant, *supra* note 17.

28. *See* JAMES J. FOREST & MATTHEW V. SOUSA, OIL AND TERRORISM IN THE NEW GULF: FRAMING U.S. ENERGY AND SECURITY POLICIES FOR THE GULF OF GUINEA 79 (2006).

29. PATIN, *supra* note 19, at 32.

Generally speaking, offshore oil and gas activity can be subdivided into four stages.[30] Each stage offers a different mix of acute and chronic environmental risks.[31] The four stages include: (1) geological and geophysical survey;[32] (2) exploration;[33] (3) development and production;[34] and (4) decommissioning.[35]

In addition to harmful effects from operational discharges, throughout the four stages there are also risks associated with accidental spills or accidents from support vessels, tankers, platform equipment, and pipelines.[36] Terrorist attacks on oil infrastructure present another potential risk of accidental release.[37] Some of these risks are already addressed through international, regional, and binational agreements.[38]

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30. *See id.* at 55.

31. *Id.*

32. The main activities in this stage are seismic surveys. *Id.* A seismic survey consists of the generation of seismic waves (sound in the water, typically accomplished with the use of air guns) and recording of their reflection from the seafloor and below surface. *Id.* at 60. This data enables scientists to predict the presence of oil and gas deposits. *Id.*

33. The second stage is the exploration stage. *Id.* at 55. Offshore drilling is accomplished with the use of floating drilling units that utilize rotating drilling bits and drilling pipe to punch a hole through the subsea strata. *Id.* at 65. An integral part of this process is the use of a drilling fluid. *Id.* Drilling fluids serve many functions, including lubrication and cooling of the drill bit, well stabilization, well pressure control, and removal of drilled rock and sand (cuttings). *Id.* Drilling fluids (or drilling muds) are a mixture of several components and can be water-based, oil-based or synthetic-based (olefins or ester-based). *Id.* at 65, 74.

34. The third stage is development and production. *Id.* at 55. This stage entails more drilling and well completions, as well as operational discharges associated with oil production operations and maintenance. *Id.* The largest discharge during this stage is produced water. *Id.* at 69–70. These are brines that are produced by the well from the subsurface of the geological formations. *Id.* at 70. Wells can produce a mixture of oil, produced water, and gas, with the percentage of each varying depending on the age of the well. *Id.* at 70–71.

35. The fourth stage involves decommissioning of platforms and pipelines. *Id.* at 55. The issues associated with this stage typically involve whether to abandon a platform in place, remove it completely, or sink it to the bottom of the sea. *See id.* at 99.

36. *See id.* at 85–94.

37. *See generally* FOREST & SOUSA, *supra* note 28, at 109–25 (discussing oil terrorism concerns in the Gulf of Guinea).

38. *See* United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 7 [hereinafter UNCLOS]; Protocol of 1978 Relating to the International

A final environmental impact has to do with atmospheric emissions. From that standpoint, the main impact is emissions of greenhouse gases from flaring and venting.[39]

III. OIL AND GAS IN THE GULF OF GUINEA

The Gulf of Guinea is located on the west central coast of Africa and encompasses the countries of Nigeria, Chad, Cameroon, Equatorial Guinea, Angola, Sao Tome and Principe, Gabon, and Congo.[40] From a marine ecology perspective, the region is also known as the Guinea Current Large Marine Ecosystem and encompasses all the coastal countries from Guinea Bissau in the North to Angola in the South.[41] About 40% of the people in the region live in coastal areas.[42]

The Gulf of Guinea has estimated reserves of 24 billion barrels of oil.[43] Estimates indicate that the Gulf of Guinea countries already account for 4.2% of world oil reserves and 6.5% of oil production in 2007.[44] However, this number is expected to grow, given that exploration is only now commencing in some

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Convention for the Prevention of Pollution From Ships, Feb. 17, 1978, 1340 U.N.T.S. 61, 62 [hereinafter MARPOL 73/78]. An example of a binational agreement is the Agreement of Cooperation regarding Pollution of the Marine Environment by Discharges of Hydrocarbons and Other Hazardous Substances, with Annexes, July 24, 1980. Agreement of Cooperation between the United Mexican States and the United States of America Regarding Pollution of the Marine Environment by Discharge of Hydrocarbons and Other Hazardous Substances, U.S.-Mex., July 24, 1980, 1241 U.N.T.S. 235. The agreement between the U.S. and Mexico was signed on July 24, 1980, after the Ixotoc catastrophe. *Id.*; Jorge A. Vargas, *The Gulf of Mexico: A Binational Lake Shared by the United States and Mexico. A Proposal*, 9 TRANSNAT'L LAW. 459, 478–79 & n.81 (1996). The Ixotoc was an exploratory well drilled by Petróleas Mexicanos (PEMEX), which had a catastrophic blowout, resulting in millions of gallons of oil spilled in the Gulf of Mexico during a span of ten months. *Id.* at 479 n.82. The oil affected the coast of Mexico, Texas, and Louisiana. *Id.*

39. PATIN, *supra* note 19, at 82.

40. FOREST & SOUSA, *supra* note 28, at 13.

41. Interim Guinea Current Commission, Regional Issues, http://igcc.gclme.org/index.php?option=com_content&task=view&id=16&Itemid=62 (last visited Feb. 8, 2009).

42. *Id.*

43. Servant, *supra* note 17, at 19.

44. BP, *supra* note 2, at 6, 8. As a region, Africa's oil reserves accounted for 9.5% of the world's reserves in 2007, compared to 7% in 1997. *Id.* at 7.

offshore areas.[45] For years, Nigeria has been a major exporter of oil, with Angola now joining the ranks of the major producers.[46] In regards to the U.S., West and Central African countries provide 12–15% of its oil supply.[47] That number is expected to grow to almost 25% by 2020.[48] China has also shown increasing interest in the region and now counts Angola as its top oil supplier.[49]

A significant amount of the region's growth in oil production will be from offshore lease blocks.[50] Some countries like Nigeria and Angola are already producing from offshore areas in the

45. *The Gulf of Guinea and U.S. Strategic Energy Policy: Hearing Before the Subcomm. on International Economic Policy, Export and Trade Promotion of the U.S. S. Comm. on Foreign Relations*, 108th Cong. (2004) [hereinafter *Hearing*] (statement of John R. Brodman, Assistant Secretary of Energy, Department of Energy). In the right circumstances, West Africa's five key producing countries (Nigeria, Angola, Gabon, the Republic of Congo Brazzaville, and Equatorial Guinea) may see their combined oil output increase by 2 to 3 million barrels a day in the next five to ten years. *Id.* Other countries in the region with promising offshore development include Senegal, Sierra Leone, and San Tome and Principe. *Id.*

46. BP, *supra* note 2, at 8. In 2007, Nigeria produced 2,356 thousand barrels per day of oil, while Angola produced 1,723 thousand barrels per day. *Id.* Nigeria is a long time member of OPEC while Angola recently joined OPEC in 2007. Organization of the Petroleum Exporting Countries, Brief History, http://www.opec.org/aboutus/history/history.htm (last visited Feb. 8, 2009).

47. *Hearing*, *supra* note 45 (testimony of David L. Goldwyn, Founder, Goldwyn International Strategies, LLC).

48. Perry, *supra* note 18. Oil from offshore Gulf of Guinea will probably play an important role in meeting the United States' stated goal of reducing dependency on Middle Eastern oil. GHAZVINIAN, *supra* note 6, at 12.

49. Perry, *supra* note 18; s*ee also* GHAZVINIAN, *supra* note 6, at 148–54 (detailing China's billion dollar loan guarantee to Angola and its major impact on Angola). Energy consumption in China grew by 7.7% in 2007. BP, *supra* note 2, at 2. There is concern that China will end up supporting African dictatorships and other authoritarian governments in order to obtain access to oil resources. Randall Peerenboom, *The Fire-Breathing Dragon and the Cute, Cuddly Panda: The Implication of China's Rise for Developing Countries, Human Rights, and Geopolitical Stability*, 7 CHI. J. INT'L L. 17, 43 (2006).

50. Servant, *supra* note 17. Former Exxon CEO Lee Raymond identified offshore Africa as one of the most promising areas in the world for future oil exploration. Fareed Zakaria, *Black-Gold Booster*, NEWSWEEK, Sept. 3, 2007, at 48.

Gulf of Guinea, while others are starting to conduct exploration activities.[51] By some estimates, West Africa already has up to 547 major offshore oil and gas structures.[52]

Oil from this region offers the added benefit that it is mostly light, sweet crude, which is cheaper and easier to refine. [53] In addition, contrary to some of the world's proven reserves, the countries of the Gulf of Guinea have so far welcomed foreign investment.[54] This is important for large multinationals trying to increase production.[55] It is also important for rapidly developing countries with large capital investment potential, such as China.[56] Still, probably the most important advantage offered by oil from the region is the fact that most of it is offshore.[57] This greatly reduces the probability of disruptions caused by political, social, or military conflicts.[58]

The Gulf of Guinea also has vast untapped natural gas reservoirs.[59] Nigeria has the world's seventh largest proven natural gas reserves.[60] Without including the gas being flared or reinjected, Africa holds about 8% of the world's proven reserves, but only accounts for about 5% of the world's production.[61]

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51. FOREST & SOUSA, *supra* note 28, at 14.

52. MORAKINYO ADEDAYO AYOADE, DISUSED OFFSHORE INSTALLATIONS AND PIPELINES: TOWARDS "SUSTAINABLE DECOMMISSIONING" 74–77 (Thomas Wälde ed. 2002).

53. GHAZVINIAN, *supra* note 6, at 9.

54. *Id.* at 10–11.

55. *See id.* at 10–12 (describing Africa's speed of growth in oil production and the potential to increase production as the underexplored regions are exposed).

56. *See id.* at 9–11 (outlining various attributes of the African oil boom, such as opportunity for profit and increased production, which are attractive to China for its potential investment capabilities).

57. *Id.* at 11.

58. *Id.* at 87–88.

59. *Hearing*, *supra* note 45 (statement of John R. Brodman).

60. BP, *supra* note 2, at 22. Nigeria has 5.3 trillion cubic meters of proven natural gas reserves. *Id*. By comparison, the U.S. has 5.98 trillion cubic meters. *Id.* However, most of this Nigerian gas is wasted by flaring due to lack of infrastructure. Energy Information Administration, Nigeria: Natural Gas, http://www.eia.doe.gov/emeu/cabs/Nigeria/NaturalGas.html (last visited Feb. 8, 2009). In fact, it has been estimated that Nigeria accounts for about 25% of the world's flaring. Steve Inskeep, *Gas Flaring Continues to Plague Nigeria*, NPR, Aug. 25, 2005, http://www.npr.org/templates/story/story.php?storyId=4797953.

61. *Hearing*, *supra* note 45 (statement of John R. Brodman, Assistant Sec. of Energy, Dep't of Energy).

In addition to oil and gas, the Gulf of Guinea has other valuable natural resources to offer. The area is very rich in commercially valuable fish.[62] It is also an important region for marine biodiversity.[63] Coastal mangroves, wetlands, and marine areas serve as important living environments for flora and fauna.[64]

The Gulf of Guinea coastline, along with neighboring coastlines in West Africa, would be directly affected by pollution from offshore oil and gas activities.[65] One of the major threats is a spill from an oil-carrying tanker originating from the Gulf of Guinea.[66] Many oil shipments from the Gulf of Guinea, especially from Nigeria, Angola, and Gabon, pass by the area known as the West African Marine Ecological Region on their way to the U.S. and other purchasers.[67] Fisheries dominate the economy of this area.[68] A major oil spill adversely impacting the fish population would have disastrous results for the regional economy.[69]

There is already talk of negative environmental effects directly related to offshore exploration in the area.[70] In the Angolan province of Cabinda, locals complain about their

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62. *See* Interim Guinea Current Commission, *supra* note 41.

63. UNITED NATIONS ENV'T PROGRAMME, REGIONAL PROFILE: WESTERN AFRICA REGION 6–9, http://www.unep.org/regionalseas/programmes/unpro/westernafrica/instruments/r_profile_wacaf.pdf (last visited Feb. 8, 2009) [hereinafter REGIONAL PROFILE]. In the larger West and Central Africa coastal region, 70% of the fish species are endemic. *Id.* at 8.

64. Interim Guinea Current Commission, *supra* note 41. For example, the Gulf of Guinea has sizable colonies of terns, noddies, and boobies. The West African manatee inhabits suitable areas from Senegal to Angola. REGIONAL PROFILE, *supra* note 63, at 8–9.

65. SANDRA KLOFF & CLIVE WICKS, IUCN COMM'N ON ENVTL, ECON. & SOC. POLICY, ENVIRONMENTAL MANAGEMENT OF OFFSHORE OIL DEVELOPMENT AND MARITIME OIL TRANSPORT 25–31 (2004), http://cmsdata.iucn.org/downloads/offshore_oil_eng.pdf.

66. *Id.* at 15.

67. *Id.* The region is composed of Mauritania, Senegal, Gambia, Guinea Bissau, Guinea, and Cape Verde. *Id.* at 14. It should be noted that in 2001 oil was also discovered offshore in the West African marine ecological region. *Id.* at 3.

68. *See id.*

69. *See id.* at 15.

70. *See* GHAZVINIAN, *supra* note 6, at 158.

beaches turning black with oil.[71] Although industry spokespersons point to natural sources as the culprit, the locals assert that the beach did not appear oily before offshore oil exploration began.[72]

Oil and gas activity is not the only environmental threat faced by the Gulf of Guinea and the larger West and Central African coastal region. Among other threats, perhaps the most important are land-based sources of pollution such as untreated urban sewage, solid waste disposal, and agricultural runoff.[73] Although the land-based threat is arguably greater, the threat from sea-based pollution from oil and gas is not insignificant, especially regarding fisheries.[74] The reality is that all significant threats to the area's marine environment need to be addressed.

IV. EXISTING LEGAL FRAMEWORK FOR ENVIRONMENTAL PROTECTION DURING OFFSHORE OIL AND GAS ACTIVITIES AND THEIR APPLICABILITY TO THE GULF OF GUINEA

As is the case for other regions of the world, offshore exploration and production in the Gulf of Guinea is subject to a combination of global, national, and regional legal instruments that regulate the activity.[75] Some of these instruments include environmental requirements aimed at protecting people and the biological environment.[76]

71. *See id.* at 157–58.

72. *See id.* at 158.

73. REGIONAL PROFILE, *supra* note 63, at 25.

74. *See id.* at 26. There is also a need for more environmental protection in the very near future. The West African offshore fields could be depleted in as fast as eight to fifteen years. KLOFF & WICKS, *supra* note 65, at 10.

75. *See generally* Zhiguo Gao, *Environmental Regulation of Oil and Gas in the Twentieth Century and Beyond: An Introduction and Overview*, in ENVIRONMENTAL REGULATION OF OIL AND GAS 3, 13 (Zhiguo Gao ed. 1998) (describing the legal framework for environmental regulation as a combination of international law and national legislation).

76. *See generally id.* at 13–18 (identifying environmental requirements in legal instruments and the purpose of the requirements).

A. Global Instruments

There are only a few global environmental instruments that directly or indirectly affect offshore oil and gas operations.[77] Of these, there are three key treaties of significance. [78]

1. 1972 London Dumping Convention[79]

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter regulates, *inter alia*, the intentional dumping at sea of offshore platforms.[80] The intentional disposal at sea of these structures is only allowed by permit from the contracting state having jurisdiction over the installation.[81]

The 1996 Protocol supersedes the 1972 Convention and entered into force on March 24, 2006.[82] Under the Protocol, all dumping is prohibited unless it falls under the Annex 1 list,[83] or under the force majeure exceptions in Article 8.[84] Annex 1 wastes need to be permitted before dumping.[85] Offshore platforms being decommissioned are included in Annex 1.[86]

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77. *Id.* at 13–17 (identifying six such global environmental instruments).

78. *Id.* at 14–16. In regards to degradation of marine environments by offshore oil and gas platforms, Agenda 21 calls for States to "assess[] existing regulatory measures to address discharges, emissions and safety and assess[] the need for additional measures[.]" United Nations Conference on Environment and Development, *supra* note 23, para. 17.30(c).

79. Of the Gulf of Guinea countries, Cameroon, Chad, Congo, and Sao Tome and Principe have not consented to the 1972 London Convention. *See* International Maritime Organization [IMO], Status of Conventions, http://www.imo.org/includes/blastDataOnly.asp/data_id%3D24388/status-x.xls (last visited Feb. 8, 2009).

80. *See generally* Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Dec. 29, 1972, 1046 U.N.T.S 138, 145 (regulating dumping at sea). The Convention defines dumping as including the "deliberate disposal at sea of vessels, aircraft, platforms or other man-made structures at sea." *Id.* at 140.

81. *See id.* at 141.

82. IMO, London Convention 1972, http://www.imo.org/home.asp?topic_id=1488 (last visited Feb. 8, 2009).

83. 1996 Protocol to the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Annex 1, Nov. 7, 1996, 36 I.L.M. 1, 21.

84. *Id.* at 11.

85. *Id.* at 10.

86. *Id.* at 21.

The Protocol also prohibits incineration of wastes or other matter at sea.[87] "Wastes or other matter" is defined broadly as "material and substance of any kind, form or description."[88] "Incineration at sea" means deliberate disposal of wastes by thermal destruction, but does not include wastes generated during the normal operation of the platform.[89]

However, Article 1.4.3 indicates that "[t]he disposal or storage of wastes or other matter directly arising from or related to the exploration, exploitation and associated off-shore processing of seabed mineral resources is not covered by the provisions of this Protocol."[90] Thus, application of this Protocol to wastes from offshore E & P activities is limited.

2. 1973/1978 MARPOL Convention[91]

The Convention for the Prevention of Pollution from ships 1973/78 (MARPOL) mainly addresses operational and accidental discharges from ships.[92] Annex I also applies to fixed and floating drilling rigs and platforms.[93] The main requirement for these offshore facilities is the prohibition against discharging oil or oily mixtures, with a few exceptions.[94] However, this arguably only applies to discharges that are similar and analogous to discharges from ships.[95] MARPOL itself indicates that the term

87. *Id.* at 10.

88. *Id.* at 9.

89. *Id.*

90. *Id.* at 8.

91. Of the Gulf of Guinea countries, Cameroon and Chad have not consented to any of the MARPOL Annexes. *See* Status of Conventions, *supra* note 79.

92. *See generally* MARPOL 73/78, *supra* note 38, at 62 (recognizing the need to regulate pollution from ships and oil tankers).

93. *Id.* at 212.

94. *See id.* at 202–03, 205 (describing the prohibition against discharging oil or oily mixtures and exceptions to the prohibition).

95. Sergei V. Vinogradov & Jay Paul Wagner, *International Legal Regime for the Protection of the Marine Environment Against Operational Pollution from Offshore Petroleum Activities*, in ENVIRONMENTAL REGULATION OF OIL AND GAS INDUSTRY 93, 106 (Zhiguo Gao ed. 1998) (arguing MARPOL 73/78 only applies to platforms when they perform activities that are similar to ships). The International Maritime Organization has interpreted MARPOL Annex I, Regulation 21 as only applying to "machinery space drainage". *Id.* at 105–06.

"discharge" does not include "[r]elease of harmful substances directly arising from the exploration, exploitation and associated off-shore processing of sea-bed mineral resources . . ."[96]

A special case is the recent development of floating production, storage, and offloading vessels (FPSOs).[97] They are large ships equipped with oil processing and storage capabilities.[98] With a FPSO, oil produced from the well is processed and stored in the vessel itself. The FPSO can then transfer the oil to tankers, which deliver the oil to the buyers.[99] Contrary to traditional production platforms, which pump the oil to shore via pipelines, a FPSO stores a large quantity of oil onboard.[100] However, FPSOs are largely treated in MARPOL as floating platforms. For example, MARPOL defines "oil tanker" as "a ship constructed or adapted primarily to carry oil in bulk in its cargo spaces . . . ."[101] Because FPSOs do not carry or deliver the oil anywhere (they only store it), they do not fall under the definition of oil tanker.[102] Thus, many of the design requirements for oil tankers, such as double hulls, do not apply to FPSOs.[103] The Marine Environment Protection Committee of the International Maritime Organization issued guidelines for the application of Annex I to FPSOs.[104] These guidelines recommended that states apply some of the oil tanker requirements to FPSOs, but acknowledged that the individual

96. MARPOL 73/78, *supra* note 38, at 185.

97. GHAZVINIAN, *supra* note 6, at 84–85. By some estimates, there are at least six FPSOs operating in offshore West Africa, with more expected to come online in the future. *Id.* at 87.

98. *Id.* at 84–85 (discussing FPSOs as "the size of several football fields" where crude oil is "brought [in] for processing" and "stored in containers").

99. *Id.*

100. *See id.* (describing FPSOs with containers storing in excess of 2 million barrels rather than using pipelines).

101. MARPOL 73/78, *supra* note 38, at 197.

102. IMO, Marine Env't Prot. Comm., *MARPOL Annex I Requirements to Floating Production, Storage and Offloading Facilities (FPSOs) and Floating Storage Units (FSUs)*, Annex 32, Resolution MEPC.139(53), at 4, MEPC 53/24/Add.2 (July 22, 2005) [hereinafter *Guidelines for FPSOs*].

103. *Id.* at 7–8.

104. *Id.* at 2.

states are not required by MARPOL to do so.[105] Thus, FPSOs are only required to meet most of the requirements of ships of 400 gross tonnage and above other than oil tankers.[106]

Annex IV, which regulates the discharge of sewage, applies to offshore platforms with more than ten persons.[107] Annex V, which regulates the discharge of garbage, applies to all offshore platforms.[108] Annex V specifically prohibits the disposal of garbage from "fixed or floating platforms engaged in the exploration, exploitation and associated offshore processing of seabed mineral resources, and from all other ships when alongside or within 500 metres of such platforms."[109]

Annex VI was promulgated in 1997 and addresses air pollution.[110] Although platforms and drilling rigs are included as ships, the Annex does not apply to emissions solely related to its drilling, production, or processing functions.[111] Thus, the Annex does not cover flaring of produced gas.[112]

105. *Id.*

106. MARPOL 73/78, *supra* note 38, at 212.

107. *Id.* at 257.

108. *Id.* at 264.

109. *Id.* The term "garbage" is defined, in part, as "all kinds of victual, domestic and operational waste excluding fresh fish and parts thereof, generated during the normal operation of the ship . . ." *Id.* at 263. However, the disposal of food wastes is allowed if the platform is more than twelve nautical miles from shore and the food has been ground to a size no greater than twenty-five millimeters. *Id.* at 264.

110. Protocol of 1997 to Amend the International Convention for the Prevention of Pollution from Ships, 1973, as Modified by the Protocol of 1978 Relating Thereto, Sept. 26, 1997, MP/CONF.3/34.

111. *See* Addition of Annex VI to the International Convention for the Prevention of Pollution from Ships, 1973, as Modified by the Protocol of 1978 Relating Thereto, Regulation 19, S. TREATY DOC. No. 108–07 (1998).

112. *Id.*

3. 1982 Convention on the Law of the Sea[113]

The Law of the Sea Convention of 1982 is a comprehensive global instrument that seeks to allocate resources and responsibilities associated with the world's oceans.[114] It assigns the limits of state ownership in the Continental Shelf and assigns an "Exclusive Economic Zone" to each coastal state.[115] Part XII of the Convention specifically addresses marine environmental protection.[116] Regarding offshore oil activities, it aims to minimize to the fullest extent possible

> pollution from installations and devices used in exploration or exploitation of the natural resources of the seabed and subsoil, in particular measures for preventing accidents and dealing with emergencies, ensuring the safety of operations at sea, and regulating the design, construction, equipment, operation and manning of such installations or devices. . .[117]

UNCLOS calls for states to cooperate on a global and regional basis to develop and implement any instruments and protocols necessary to carry out its marine protection requirements.[118]

Article 208, entitled *Pollution from Seabed Activities Subject to National Jurisdiction,*[119] states:

> 1. Coastal States shall adopt laws and regulations to prevent, reduce and control pollution of the marine environment arising from or in connection with seabed activities subject to their jurisdiction and from artificial

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113. All of the Gulf of Guinea countries have signed the United Nations Convention on the Law of the Sea (UNCLOS). *See* Status of the United Nations Convention on the Law of the Sea, of the Agreement Relating to the Implementation of Part XI of the Convention and of the Agreement for the Implementation of the Provisions of the Convention Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, http://www.un.org/Depts/los/reference_files/status 2008.pdf (last visited Feb. 8, 2009 (listing the dates of signature for all countries that have signed UNCLOS as of Nov. 7, 2008).

114. Vinogradov & Wagner, *supra* note 95, at 99.

115. *Id.* at 101.

116. UNCLOS, *supra* note 38, at 100.

117. *Id.* at 101.

118. *Id.* at 102.

119. *Id.* at 104–05.

> islands, installations and structures under their jurisdiction, pursuant to articles 60 and 80.
>
> 2. States shall take other measures as may be necessary to prevent, reduce and control such pollution.
>
> 3. Such laws, regulations and measures shall be no less effective than international rules, standards and recommended practices and procedures.
>
> 4. States shall endeavor to harmonize their policies in this connection at the appropriate regional level.
>
> 5. States, acting especially through competent international organizations or diplomatic conference, shall establish global and regional rules, standards and recommended practices and procedures to prevent, reduce and control pollution of the marine environment referred to in paragraph l. Such rules, standards and recommended practices and procedures shall be re-examined from time to time as necessary.[120]

In essence, UNCLOS establishes a framework for later protocols and instruments dealing with control of marine pollution.[121] However, it does not provide the specifics of how the goals will be accomplished. Rather, its main importance is in requiring regional harmonization and standards, as well as assigning and allocating responsibility among states.[122]

120. *Id.*

121. *See* BERNARD TAVERNE, PETROLEUM, INDUSTRY AND GOVERNMENTS: AN INTRODUCTION TO PETROLEUM REGULATION, ECONOMICS AND GOVERNMENT POLICIES 292 (Thomas W. Wälde ed. 1999) (explaining that the Convention is only concerned with allocating responsibilities for designing rules and standards).

122. *Id.*

B. National Laws

The countries of the Gulf of Guinea have national laws that address petroleum exploration and development.[123] However, national laws specifically addressing environmental protection requirements for offshore oil and gas activities are rare, with Angola being a notable exception.[124] Usually, environmental concerns related to offshore E & P are dealt with in the country's petroleum laws or by general language in licenses or contracts.[125] The language usually consists of general goals and principles, and does not offer many specific requirements.[126]

Even in countries with detailed environmental ideals and principles, enforcement of these environmental laws is usually seen as lacking.[127] In the case of Angola, which has detailed and comprehensive regulations of offshore operational discharges,[128] the enforcement gap appears to be a result of insufficient marine pollution knowledge as well as a shortage of monitoring

123. *See, e.g.*, *id.* at 267, 268–70 (noting the laws of Angola and Nigeria).

124. *See, e.g.*, Connie Frizzell, *Insider's Perspective: Creating a Culture of Maritime Security in the Gulf of Guinea*, STRATEGIC INSIGHTS, Jan. 2007, http://www.ccc.nps.navy.mil/si/2007/Jan/frizzellJan07.pdf (noting the lack of environmental protection laws in the region); HEIDI CURRIE, SHAHEEN MOOLA & DOMINGAS PAIM, BENGUELA CURRENT LARGE MARINE ECOSYSTEM PROGRAMME, REPORT ON THE ASSESSMENT OF THE STATUS OF THE ABIDJAN CONVENTION IN THE BENGUELA REGION AND IMPLICATIONS FOR THE BENGUELA CURRENT COMMISSION 18–20 (2007), http://www.bclme.org/factfig/docs/Report%20to%20the%20BCLME%20on%20Abidjan%20Convention%20-%202%20Nov%202007.pdf (explaining the laws of Angola).

125. Gao, *supra* note 75, at 35.

126. *Id.* For example, Nigeria's Model Production Sharing Contract of 1995 is almost silent on environmental considerations. *Id.* at 36.

127. *See* Kit Armstrong, *Managing Environmental Legal Risks in Oil and Gas Exploration and Production Activities*, *in* ENVIRONMENTAL REGULATION OF OIL AND GAS 364, 359–89 (Zhiguo Gao ed. 1998) (noting that implementation and enforcement is uneven in many countries); CURRIE ET AL., *supra* note 124, at 31 (noting significant gaps in enforcement in South Africa, Angola, and Namibia); Kristin Reed, *Environmental Law Enforcement and the Survival Mentality*, U.C. BERKLEY NEWSCENTER, http://www.berkeley.edu/news/students/2003/angola/6.shtml (describing the enforcement of environmental law in Angola as "non-existent").

128. Angola has a specific law called "Decree on Environmental Protection for Petroleum Activities, No. 39/00" aimed at ensuring that oil and gas activities are conducted in a manner that is protective of the environment. CURRIE ET AL., *supra* note 124, at 19.

capacity.[129] Thus, the reality is that the countries in the region suffer from a lack of governmental resources to develop comprehensive regulatory scheme or to enforce the existing rules.[130]

Relying on national law alone has several disadvantages. Generally, such reliance allows inconsistent regulations on areas common to different countries.[131] Because the ecosystem is shared between countries, one country's less stringent limitations will also affect neighboring countries.[132] The national approach could also offer area nations the incentive to make less stringent environmental regulations with the hope of attracting more foreign investment.[133] This may be particularly true of foreign national oil companies and small independent operators that do not have corporate responsibility initiatives or corporate environmental minimum requirements.[134]

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129. *Id.* at 33; NKOSI LUYEYE, BENGUELA CURRENT LARGE MARINE ECOSYSTEM PROGRAMME, A REVIEW OF THE IMPACTS OF SEISMIC SURVEYING AND TOXICITY OF OIL PRODUCTS ON THE EARLY LIFE HISTORY STAGES OF PELAGIC FISH, THE BENTHOS AND THE PELAGIC ECOSYSTEM WITH POTENTIAL APPLICATION TO THE SARDINELLA FISHERY (SARDINELLA AURITA) IN THE ANGOLAN WATERS 27–28 (2005), http://www.bclme.org/projects/docs/LMR-CF-03-12%20(final%20report).doc.

130. Vinogradov & Wagner, *supra* note 95, at 139; *see also* E & P FORUM/UNEP, ENVIRONMENTAL MANAGEMENT IN OIL AND GAS EXPLORATION AND PRODUCTION: AN OVERVIEW OF ISSUES AND MANAGEMENT APPROACHES 24–25 (1997) [hereinafter E & P FORUM/UNEP] (explaining the infrastructure needed for environmental protection).

131. *See* Gao, *supra* note 75, at 39 (noting that environmental regulatory approaches are not always mutually exclusive and that "[t]hey may overlap with one another, or even be used together in some jurisdictions"). *But cf.* Vinogradov & Wagner, *supra* note 95, at 137 (noting that regional approaches allow for coordinated efforts in common interest areas).

132. *See, e.g.*, Vinogradav & Wagner, *supra* note 95, at 118 (explaining that because pollutants are "inherently mobile", pollution does not respect political boundaries).

133. *See* Zakia Afrin, *Foreign Direct Investments and Sustainable Development in the Least-Developed Countries*, 10 ANN. SURV. INT'L & COMP. L. 215, 219 (2004).

134. *See* E & P FORUM/UNEP, *supra* note 130, at 23 (explaining that while some individual companies have established their own guidelines, government regulations remain the cornerstone of environmental protection). A sizable number of West Africa offshore leases have gone to small, independent operators with little or no operational experience, and a few with dubious track records. GHAZVINIAN, *supra* note 6, at 218–24.

One possible path forward could be for the international community to support individual governments in development of national environmental rules specifically addressing offshore E & P.[135] However, it would be more efficient for these countries to first put together a regional framework. The international community could then support the implementation of the framework in the individual states. In addition, Article 208 of UNCLOS would seem to require a regional approach in the establishment of rules, standards, and recommended practices.[136]

A regional framework levels the playing field by providing a minimum floor for environmental regulation.[137] It can also provide an additional mechanism to supplement individual government enforcement efforts that are at best insufficient, and at worst subject to corruption.[138] For example, OSPAR requires signatory countries to publish discharge data, which can allow neighboring countries and non-governmental organizations to exert an indirect influence on national enforcement.[139]

C. The Regional Approach

An exclusively national approach to preventing offshore pollution in the Gulf of Guinea suffers from serious flaws. Similarly, existing global instruments have serious coverage gaps regarding offshore E & P operations.[140] The possibility of a new global instrument developed specifically for offshore E & P

135. *See* Armstrong, *supra* note 127, at 364.

136. *See* UNCLOS, *supra* note 38, at 104–05.

137. *See id.* (requiring that states establish regional rules that are no less effective than international standards).

138. *See* SUSAN ROSE-ACKERMAN, CORRUPTION AND GOVERNMENT: CAUSES, CONSEQUENCES, AND REFORM 18–19 (1999) (discussing how corruption affects the enforcement of environmental regulations in developing countries).

139. *See* OSPAR COMMISSION, PRINCIPLES OF THE COMPREHENSIVE STUDY ON RIVERINE INPUTS AND DIRECT DISCHARGES, http://www.ospar.org/documents/DBASE/DECRECS/Agreements/98-05e_RID%20principles.doc (requiring the annual reporting of discharge data); Vinogradov & Wagner, *supra* note 95, at 138–39 (explaining that the data is made available to NGOs).

140. Vinogradov & Wagner, *supra* note 95, at 135.

operations is unlikely.[141] Therefore, a regional approach is arguably the best method for protecting the region from environmental harms related to petroleum activities.[142]

Using a regional approach to achieve protection of the seas is not a new concept.[143] For example, the North Sea region has for a long time been governed by different regional conventions and protocols aimed at preventing pollution from oil-related activities.[144] The first one, known as the "Bonn Agreement", was signed in 1969 following a major release of oil from a grounded vessel.[145] More conventions were signed in later years, culminating in the 1992 adoption of the OSPAR Convention.[146]

The OSPAR Convention's principles include the "precautionary principle" and "polluter pays principle."[147] It also requires the application of "best available techniques" (BAT) and "best environmental practice" (BEP), including clean technology.[148] Finally, it established the OSPAR Commission, which issues binding decisions and recommendations that can be very technical and detailed.[149] The OSPAR approach has

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141. *See id.* at 137.

142. *Id.; see also* P.H. Sand, *The Rise of Regional Agreements for Marine Environment Protection*, *in* FAO ESSAYS IN MEMORY OF JEAN CARROZ: THE LAW AND THE SEA (1987), *available at* http://www.fao.org/docrep/s5280T/s5280t0y.htm (documenting the increased use of regional agreements for marine protection). From an ecological standpoint, a regional approach is also preferred because the effects of pollution are usually felt on a regional basin level. *See* Interim Guinea Current Commission, *supra* note 41 (explaining that environmental data are difficult to synthesize because of their spatially fragmented character).

143. *See* Sand, *supra* note 142 (tracing the history of the regional approach from the 1969 Bonn Agreement for Cooperation in Dealing with Pollution of the North Sea by Oil).

144. *See* Vinogradov & Wagner, *supra* note 95, at 123–27 (explaining the history of regulation in the region through the 1974 Paris Convention on the Prevention of Marine Pollution from Land-based Sources, the 1986 Protocol to the Convention, and the 1992 OSPAR Convention).

145. *See* Sand, *supra* note 142 (noting that the 1969 Bonn Agreement followed the "Torrey Canyon" accident).

146. Convention for the Protection of the Marine Environment of the North-East Atlantic, Sept. 22, 1992, 32 I.L.M. 1069 [hereinafter OSPAR].

147. *Id.* at 1076.

148. *Id.* The terms "best available techniques" and "best environmental practice" are defined in Appendix 1 of the OSPAR Convention. *Id*. at 1098–99.

149. *Id.* at 1079.

proven very successful in addressing pollution from oil and gas offshore activities.[150] Created to supersede the Oslo and Paris Conventions, OSPAR has developed a remarkable body of protocols and decisions that, contrary to most regional instruments, include detailed operational requirements and limitations. [151] The approach has been successful in consistently regulating discharges to the North Sea.[152]

The Baltic Sea region was also one of the first to have a regional instrument for the prevention of marine pollution.[153] The original 1974 Helsinki Convention made specific mention of offshore E & P activities.[154] The 1992 Convention now addresses discharges from offshore E & P activities in more detail.[155] Annex VI of the Convention is titled "Prevention of Pollution From Offshore Activities" and sets specific environmental requirements for these operations.[156] Similar to OSPAR, the Helsinki Commission issues detailed recommendations, and include both numerical and categorical discharge limitations.[157]

Other Regional areas are now covered under the United Nations Environment Programme (UNEP) Regional Seas

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150. *See* OSPAR COMM'N, ANNUAL REPORT 2002–2003, VOL. 1, 36 (2003), http://www.ospar.org/documents/dbase/publications/p00195_Annual%20report%202002_2003%20V1.pdf (discussing the progress made in pursuing the Offshore Strategy). For example, the offshore discharge of dispersed oil into the sea has gone from close to 15,000 tonnes per year in 1992 to less than 10,000 tonnes per year in 2001. *Id.* at 37.

151. *See, e.g.*, OSPAR Decision 2000/2 on a Harmonized Mandatory Control System for the Use and Reduction of the Discharge of Offshore Chemicals (as amended by OSPAR Decision 2005/1), OSPAR 00/20/1-E, Annex 15 (June 30, 2003), http://www.ospar.org/v_measures/get_page.asp?v0=od00-02e.doc&v1=1 (relating to a decision setting forth operation requirements for offshore activities).

152. *See* OSPAR COMM'N, *supra* note 150, at 36–37 (stating the progress made in preventing and eliminating offshore pollution).

153. Vinogradov & Wagner, *supra* note 95, at 118–19.

154. Convention on the Protection of the Marine Environment of the Baltic Sea Area art.10, Mar. 22, 1974, 1507 U.N.T.S. 167, 172 [hereinafter 1992 Convention].

155. *See id.* (setting forth additional procedures and measures relating to prevention of pollution from offshore activities).

156. *Id.*

157. *See, e.g.*, Helsinki Commission, HELCOM Recommendation 18/2, §§ VI–VIII, (Mar. 12, 1997), http://www.helcom.fi/Recommendations/en_GB/rec18_2/ (specifying certain categorical discharge limitations).

Programme.[158] The UNEP Regional Seas Programme was started in 1974 for the purpose of providing a holistic approach to marine protection.[159] This includes issues such as marine and coastal pollution, coastal development, and ecosystem protection.[160] Hence, the scope of conventions under the Regional Seas Programme is broader than the scope of OSPAR or the Helsinki Convention.[161] There are currently thirteen Regional Seas programs and five partner programs, including the North-East Atlantic and the Baltic Sea regions.[162] Most of these regions have action plans that are usually supported by a regional Convention.[163] These action plans have met varying degrees of success.[164] The supporting conventions were meant to provide a framework for future protocols that would detail the actual requirements.[165] However, only a few of the conventions have developed a robust body of protocols and annexes to complement the instrument itself. [166]

158. *See* United Nations Environment Programme, Regional Seas Programme, http://www.unep.org/regionalseas/programmes/default.asp (last visited Feb. 8, 2009) (listing the regions covered under the UNEP Regional Seas Programme).

159. *See* Armstrong, *supra* note 127, at 361. The scope of the program includes the marine environment, coastal zones, and related inland waters. United Nations Environment Programme, *supra* note 158.

160. *See* United Nations Environment Programme, *supra* note 158 (stating the key issues for the Regional Seas Programme).

161. *Compare id.* (listing a broad set of key issues, including coastal development, ecosystems, and biodiversity), *with* OSPAR, *supra* note 146, at 1069, and 1992 Convention, *supra* note 154, at 197 (both noting a scope more limited to pollution from land-based and offshore pollution).

162. United Nations Environment Programme, *supra*, note 158.

163. *Id.*

164. *See* Vinogradov & Wagner, *supra* note 95, at 138.

165. Sand, *supra* note 142.

166. Vinogradov & Wagner, *supra* note 95, at 118–19. Two such examples are the Barcelona Convention and the Kuwait Convention. The Convention for the Protection of the Mediterranean Sea Against Pollution, *came into force* Feb. 12, 1978, 1102 U.N.T.S. 45; Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment from Pollution**,** *came into force* Apr. 24, 1978, 1140 U.N.T.S. 155. Both have developed protocols specifically addressing pollution from offshore petroleum activities. *See* United Nations Environment Programme, *supra* note 158 (listing protocols for protection from pollution resulting from exploration and exploitation in the Mediterranean and Kuwait regions).

The West and Central Africa region, which encompasses the Gulf of Guinea, has a Convention under the Regional Seas Programme called the Abidjan Convention.[167] The Abidjan Convention was adopted in 1981 to "take all appropriate measures . . . to prevent, reduce, combat and control pollution of the Convention area and to ensure sound environmental management of natural resources, using for this purpose the best practicable means at their disposal, and in accordance with their capabilities."[168] The Abidjan Convention is an established instrument of international cooperation in the area.[169] It has as members every coastal country from Mauritania to Namibia.[170] Thus, using it as a basis for developing offshore standards has the added benefit of covering areas in West Africa outside the Gulf of Guinea that may experience increased offshore activity in the future.[171]

What is already required by the Abidjan Convention regarding offshore E & P? Article 8, for example, is titled "Pollution From Activities Relating to Exploration and Exploitation of the Sea-bed" and states:

> The Contracting Parties shall take all appropriate measures to prevent, reduce, combat and control pollution resulting from or in connection with activities relating to the exploration and exploitation of the sea-bed and its subsoil subject to their jurisdiction and from artificial islands, installations and structures under their jurisdiction.[172]

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167. United Nations Environment Programme, *supra* note 158; Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region, *opened for signature* Mar. 23, 1981, 20 I.L.M. 746 [hereinafter Abidjan Convention].

168. Abidjan Convention, *supra* note 167, at 748.

169. United Nations Environment Programme, *supra* note 158 (noting that fourteen countries in the region have ratified the convention and a number of others are in the process of ratifying it).

170. Abidjan Convention, *supra* note 167, at 747.

171. *See* KLOFF & WICKS, *supra* note 65, at 3 (discussing oil exploration in other areas of the West Africa coast).

172. Abidjan Convention, *supra* note 167, at 749.

The wording of Article 8 is meant to include offshore oil and gas E & P activities.[173] However, the language of Article 8 is very general.[174] There is no indication of what appropriate measures means.[175] Similarly, the general obligations language of Article 4 is equally vague.[176] Article 4 talks about taking "all appropriate measures" and using "best practicable means" but fails to further define these terms.[177] By contrast, the OSPAR Convention uses general terms such as "best available techniques" and "best environmental practice" but later goes on to define what these terms mean.[178] With the Abidjan Convention language, each state could come up with very different interpretations of what "appropriate measures" means.[179]

Other non-binding Abidjan documents do not offer much help. Both the conference resolution and Regional Seas Programme Action Plan are mostly silent on pollution from offshore E & P.[180]

The only related item is in the Action Plan, which calls for "regular surveys of oil slicks in offshore waters" as part of regional environmental assessments.[181] However, these surveys are likely aimed at shipping activities in the area.[182]

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173. *See id.* (referring to "activities relating to the exploration and exploitation of the sea-bed and its subsoil. . .").

174. *See id.* (using undefined terms, such as "appropriate measures" to describe the obligations of the contracting parties).

175. *Id.*

176. *See id.* (using undefined terms such as "appropriate measures" and "best practicable means").

177. *Id.*

178. OSPAR, *supra* note 146, at 1098–99.

179. *See* Abidjan Convention, *supra* note 167, at 749 (using terms such as "appropriate measures" without defining the types of measures that would be deemed appropriate).

180. *See* Conference of Plenipotentiaries on Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region, *resolutions adopted by the Conference*, Mar. 23, 1981, 20 I.L.M. 734; *see also* Action Plan for the Protection and Development of the Marine Environment and Coastal Areas of the West and Central African Region, *adopted* Mar. 23, 1981, 20 I.L.M. 738.

181. *Id.* at 741–42.

182. *See id.* at 739 (noting particular protection of coastal area development).

However, the Abidjan convention contains other articles besides Article 8 that affect offshore E & P—most notably, Article 13 titled "Environmental Impact Assessment", which states:

> 1. As part of their environmental management policies, the Contracting Parties shall develop technical and other guidelines to assist the planning of their development projects in such a way as to minimize their harmful impact on the Convention area.
>
> 2. Each Contracting Party shall endeavour to include an assessment of the potential environmental effects in any planning activity entailing projects within its territory, particularly in the coastal areas, that may cause substantial pollution of, or significant and harmful changes to, the Convention area.
>
> 3. The Contracting Parties shall, in consultation with the Organization, develop procedures for the dissemination of information concerning the assessment of the activities referred to in paragraph 2 of this article.[183]

The broad language of "projects within its territory" would include offshore E & P projects.[184] Thus, if these projects may cause substantial pollution to the water, or significant and harmful changes to it, contracting states "shall endeavour" to do an environmental assessment during the planning stage.[185] However, the addition of the word "endeavour" after "shall" greatly weakens this requirement.[186] The Merriam-Webster online dictionary defines the word as "to strive to achieve or reach"; "to attempt (as the fulfillment of an obligation) by exertion of effort" and lists the word "attempt" as a synonym.[187] Thus, states only have to attempt to do an environmental assessment for these projects.

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183. Abidjan Convention, *supra* note 167, at 750.

184. *Id.*

185. *Id.*

186. *Id.*

187. *Endeavour*, MERRIAM-WEBSTER ONLINE DICTIONARY, http://www.merriam-webster.com/dictionary/endeavor (last visited Feb. 8, 2009).

The "shall endeavour" language is also present in Article 11, which deals with specially protected areas.[188] It states that "[c]ontracting [p]arties shall endeavour to establish protected areas, such as parks and reserves, and to prohibit or control any activity likely to have adverse effects on the species, ecosystems or biological processes in such areas."[189] The bar to action here is lower than in Article 13, as only a likelihood of adverse effects is necessary.[190] The language of Article 13 is enough to allow a state to limit or prohibit all offshore E & P activities in specially protected areas such as marine reserves.[191] However, states are only required to make an effort toward this end.[192]

Articles 5 and 6, which address pollution from ships, do not contain the word "endeavour".[193] Instead, Article 5 requires that parties "shall take all appropriate measures in conformity with international law to prevent, reduce, combat and control pollution in the Convention area caused by normal or accidental discharges from ships. . ."[194] "Ship" is not defined in the Convention, but likely should be read the same as in MARPOL, which includes fixed or floating platforms.[195] Regardless, even if "ship" includes offshore platforms, the requirement to use measures "in conformity with international law" means that offshore E & P discharges not currently covered by global instruments such as MARPOL are similarly not covered by Article 5 of the Abidjan Convention.[196]

Currently, there is only one protocol to the Convention that relates to cooperation in combating pollution in cases of emergency.[197] The Protocol includes a requirement to maintain marine contingency plans, either individually or in conjunction

188. Abidjan Convention, *supra* note 167, at 749.

189. *Id.*

190. *Id.* at 749–50. Compare this language to the language of Article 13, which requires "substantial pollution" or "significant and harmful changes". *Id.* at 750.

191. *See id.*

192. *Id.* (referencing "shall endeavour" language).

193. *Id.* at 748.

194. *Id.*

195. MARPOL 73/78, *supra* note 38, at 185.

196. *Id.*; Abidjan Convention, *supra* note 167, at 749.

197. *See* Protocol Concerning Co-operation in Combating Pollution in Cases of Emergency, Mar. 16, 1981, 20 I.L.M. 756.

with other parties.[198] Other requirements include emergency reporting and ability to call for assistance from other signatories during marine emergencies.[199] In addition to dealing with ship or tanker accidents, the Protocol also requires Parties to address marine emergencies that could arise at offshore E & P platforms, such as well blowouts.[200]

After a slow start, development of the Convention has recently accelerated.[201] The latest Convention meeting occurred on June 2008, when South Africa hosted an Extraordinary Meeting of the Contracting Parties to the Abidjan Convention.[202] The aim of the Extraordinary Meeting was precisely to find ways to revitalize the Convention.[203]

198. *Id.* at 759.

199. *Id.* at 758–59.

200. *Id.* at 757.

201. REGIONAL PROFILE, *supra* note 63, at 4. There were no meetings of the Parties or Steering Committee between 1988 and 2002. *Id.* A Regional Coordinating Unit hosted by Cote d'Ivoire was established in 1996. *Id.* at 19–20. In 1998, UNEP reorganized the Secretariat for both the Abidjan Convention and the Nairobi Convention, creating a Joint Implementation Unit for both. U.N. Env't Programme [UNEP], *Report of the Eighth Meeting of the Contracting Parties to the Convention for Cooperation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region*, ¶ 51, Annex XV ¶3, U.N. Doc. (DEPI)/WAF/CP.8/10 (Nov. 12, 2007). Building on this, the Eighth Conference of the Parties was held in November 2007, in conjunction with the Nairobi Convention Fifth Conference of the Parties. *Id.* ¶ 2. South Africa, which asked to join the Abidjan Convention in 2000 and ratified it in 2002, hosted this Joint Conference of Parties. *Id.* ¶ 2, Annex XV ¶ 2. One of the main aims of the COP will be to better coordinate with the ongoing "Large Marine Ecosystems" projects currently being implemented by different international organizations. *Id.* at Annex XV ¶7. There is also a push to get more countries to ratify the Abidjan Convention. United Nations Environment Programme, Extraordinary Meeting of the Contracting Partiesto the Abidjan Convention, http://www.unep.org/AbidjanConvention/Extraordinary_Meeting/index.asp (last visited Feb. 8, 2009) [hereinafter Extraordinary Meeting]. As of November 20, 2008, fourteen out of twenty-two contracting parties had ratified. United Nations Environment Programme Abidjan Convention Contracting Parties, http://www.unep.org/AbidjanConvention/The_Convention/Contracting_Parties/index.asp (last visited Feb. 8, 2009).

202. *See* Extraordinary Meeting, *supra* note 201.

203. *Id.*

The Abidjan Convention parties are considering more protocols.[204] These include protocols addressing land-based pollution, transboundary movements of hazardous waste, and dumping of wastes.[205] Of these, a protocol addressing land-based pollution seems to be closest to being adopted.[206]

There is no formal consideration of a protocol for offshore oil and gas activities.[207] However, during the Eighth Meeting of the Contracting Parties, a representative of the World Wildlife Fund made a presentation on oil and gas.[208] In his presentation, the representative identified environmental risks associated with oil and gas exploration, production and transportation. He then listed several strategic options to address the environmental challenges posed by oil and gas.[209] The two strategic options highlighted were planning and use of a regional regulatory framework.[210] Similarly, this Comment concludes that in order to adequately address all possible environmental harms from offshore development, a protocol is needed to expand on the language of Article 8 of the Abidjan Convention.

204. REGIONAL PROFILE, *supra* note 63, at 28.

205. *Id.*

206. *See* Extraordinary Meeting, *supra* note 201 (reasoning that the Abidjan Convention dealt with land-based pollutions and the continued meetings of the participating countries from that Convention help enforce the likelihood that it may be the first adopted protocol). A second draft was presented at the November 2007 Joint COP in South Africa. UNEP, *Second Draft Protocol to the Abidjan Convention Concerning Land-Based Sources and Activities (LBS/A) in the West and Central African Region*, U.N. Doc. (DEPI)/WAF/CP.8/7 (Aug. 28, 2007).

207. *See* REGIONAL PROFILE, *supra* note 63, at 28 (noting only land-based protocols are planned to be drafted).

208. *See* PAUL SIEGEL, MARINE CONSERVATION ADVISOR, WORLD WILDLIFE FUND, PEOPLE, PETROL, & THE SEA: CHALLENGES, OPPORTUNITIES & TOOLS (2007), http://www.unep.org/AbidjanConvention/docs/WWF%20Oil%20and%20Gas%20Presentation.ppt (last visited Feb. 8, 2009).

209. *Id.*

210. *Id.*

V. POSSIBLE CONTENTS OF A NEW REGIONAL PROTOCOL FOR OFFSHORE PETROLEUM ACTIVITIES

The Abidjan Convention provides an effective framework for regional action, but a specific protocol must be created to deal with offshore E & P environmental issues. The most efficient way to create this new protocol would be to first choose an existing regional protocol or set of industry guidelines as a blueprint.[211] Then, this blueprint can be updated with more recent information and modified to meet the needs of the West African region.[212] Such a protocol would need to address all the environmental issues associated with the offshore E & P project cycle—from licensing to decommissioning.

A. Choosing the Right Blueprint

Although some of the Gulf of Guinea countries have world-class oil reserves, the government resources necessary to completely write a detailed protocol are probably limited.[213] One option may be for the region to turn to accepted industry practices. The E & P Forum represents the oil industry worldwide and in combination with UNEP has come up with industry guidelines that could be used as a starting point for a regional protocol.[214] Alternatively, the region could use other regional instruments as a template for a new offshore protocol. Using an existing regional instrument as a blueprint is less burdensome than the alternative.[215]

For technical standards, the OSPAR documents have served as the basis for several regional efforts.[216] In addition, the OSPAR Commission is currently playing a supporting role for

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211. *See* E & P FORUM/UNEP, *supra* note 130, at 22 (describing effective application of environmental legislation).

212. *See, e.g.*, *id.* at 23 (explaining how the European Union tailored a plan to its needs).

213. *See id.* at 24–25 (describing numerous examples of infrastructure and resources required to implement such a protocol).

214. *Id.* at preface, 22 (describing effective application of environmental legislation).

215. *Id.* at 24 (referring to creating a protocol from scratch).

216. Vinogradov & Wagner, *supra* note 95, at 138.

the Abidjan Convention.[217] However, the OSPAR model itself is unlikely to work for the Gulf of Guinea. At a basic level, OSPAR was arguably able to work because the countries involved had a robust environmental regulatory system to start from.[218] In comparison, the regulatory systems in the Gulf of Guinea countries are not nearly as mature.[219] Even the countries that do have some regulation that is more than general statements have problems enforcing them.[220] In addition, both the OSPAR and Helsinki Conventions rely heavily on issued recommendations by their respective commissions.[221] These recommendations detail very specific technical requirements for the parties.[222] In contrast, the Abidjan Convention does not have a strong central body that could perform a similar role.[223]

Therefore, these countries need another model to work from. There are two other regional instruments under the UNEP Regional Seas Programme that specifically address offshore oil E & P: the 1989 Kuwait Protocol and the 1994 Mediterranean

217. United Nations Environmental Programme, Western Africa, http://www.unep.org/regionalseas/programmes/unpro/westernafrica/default.asp (last visited Feb. 8, 2009).

218. Vinogradov & Wagner, *supra* note 95, at 123–27. The 1992 OSPAR Convention superseded the 1974 Paris Convention, which applied to discharges from offshore platforms. *Id.*

219. *Compare* TAVERNE, *supra* note 121, at 267, 268–70 (discussing the laws of Angola and Nigeria), *with* Convention for the Prevention of Marine Pollution from Land-Based Sources, June 4, 1974, 13 I.L.M. 352.

220. Gao, *supra* note 75, at 39.

221. *See* OSPAR, *supra* note 146, at 204–06; 1992 Convention, *supra* note 154, at 1097.

222. *See* sources *supra* note 221.

223. *Compare* Abidjan Convention, *supra* note 167, *with* OSPAR, *supra* note 146, *and* 1992 Convention, *supra* note 154. However, any new offshore protocol would require the Convention Parties to address a limited number of technical issues such as approved testing methods for discharge parameters. *See, e.g.*, OSPAR Agreement 2005/15 Replacing Agreement 1997/16 on OSPAR Reference Method of Analysis for the Determination of the Dispersed Oil Content in Produced Water, Offshore Oil and Gas Industry: Decisions, Recommendations and Other Agreements, January 1, 2007, http://www.ospar.org/documents/dbase/decrecs/agreements/05-15e_reference %20method%20oil%20in%20produced%20water.doc.

Offshore Protocol.[224] Of these, the Kuwait Protocol seems to be the best choice for an Abidjan Protocol for two reasons: (1) both regions are made up solely of developing countries[225] and (2) the Mediterranean Offshore Protocol has only been ratified by three countries and is thus not yet in force.[226] However, because the Kuwait Protocol is almost twenty years old,[227] it should be supplemented by items from the other three offshore regional instruments (OSPAR, Helsinki, and Mediterranean).[228]

B. Specific Recommendations

1. Licensing and Environmental Impact Assessments

Articles III and IV of the Kuwait Protocol deal with licensing of operators and requirements to perform environmental impact assessments (EIAs).[229] Article III requires that any offshore operation has to be conducted under a license from a competent state authority.[230] The state authority can impose conditions on operators to protect the marine environment.[231] The license also requires compliance with all relevant laws and regulations.[232] Article IV requires operations that could cause "significant risks of pollution" to submit an EIA to the state authority before the

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224. Protocol Concerning Marine Pollution Resulting from Exploration and Exploitation of the Continental Shelf, Mar. 29, 1989, 2065 U.N.T.S 91 [hereinafter Kuwait Protocol]; Protocol for the Protection of the Mediterranean Sea Against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil, Oct. 14, 1994, UNEP(OCA)/MEDIG.4/4 (last visited Feb. 8, 2009) [hereinafter Mediterranean Offshore Protocol].

225. UNITED NATIONS DEV., HUMAN DEVELOPMENT REPORT 2007/2008 229–32 (2007), http://hdr.undp.org/en/media/HDR_20072008_EN_Complete.pdf.

226. United Nations Environment Programme, Mediterranean—Governing Instruments, http://www.unep.org/regionalseas/Programmes/unpro/mediterranean/instruments/default.asp (last visited Feb. 8, 2009) [hereinafter UNEP Governing Instruments].

227. Kuwait Protocol, *supra* note 224, at 69.

228. OSPAR, *supra* note 146; 1992 Convention, *supra* note 154; UNEP Governing Instruments, *supra* note 226.

229. Kuwait Protocol, *supra* note 224, at 93.

230. *Id.*

231. *Id.*

232. *Id.*

operation can be considered for a license.[233] The state decides when such an assessment is required and what its scope will be.[234] A summary of the assessment is distributed to the other contracting parties to the Protocol for comment.[235] Even if the state determines that no EIA is required (i.e., no significant risks of pollution exist), it can still require the licensee to perform a marine survey of the area before the operation begins.[236]

This approach should be a reasonable one to take in any future offshore protocol under the Abidjan Convention. The Abidjan Convention already requires EIAs in some circumstances.[237] Production Sharing Agreements (PSAs), which tend to say very little about environmental protection, would be complemented by a licensing program similar to the one described in the Kuwait Protocol.[238]

2. Seismic Surveys

Offshore, oil-containing geological formations must be found before drilling for oil can begin. Oil exploration typically begins with the use of seismic surveys.[239] Arguably, the high energy waves associated with seismic activity may harm fish and other marine life.[240] There have not been enough studies, however, to show a definite harm to marine life.[241] Still, the race to find oil in Africa means that a large number of seismic surveys are being conducted in the region; thus, the possible risks from these operations cannot be ignored.[242]

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233. *Id.*

234. *Id.*

235. *Id.*

236. *Id.* at 94.

237. Abidjan Convention, *supra* note 167, at 750.

238. Gao, *supra* note 75, at 35.

239. PATIN, *supra* note 19, at 60.

240. *See id.* at 61.

241. *See id.*

242. *Industry at a Glance*, WORLD OIL, Oct. 2007, at 158. The Africa region trails only the United States in the number of seismic crews working. *Id.*

In Article XI, the Kuwait Protocol requires that seismic survey operations take into account any guidelines issued by the regional organization under the Kuwait Convention.[243] Additional information about seismic surveys has been accumulated since the Kuwait Protocol was created almost twenty years ago.[244]

Other regions of the world already have guidelines for protecting marine life that apply during the performance of seismic surveys.[245] The Joint Nature Conservation Committee, an advisory group to the government of the United Kingdom, published guidelines for minimizing disturbance of marine mammals by seismic surveys.[246] The guidelines include requirements that apply before, during, and after seismic operations.[247] Key among these is the use of Marine Mammal Observers that look and listen for marine mammals in the vicinity of the work.[248] If marine mammals are observed within 500 meters of the survey area, the seismic survey should be delayed until the marine mammals move out of the area.[249] A future Abidjan protocol should include a requirement to use Marine Mammal Observers, as well as inclusion of the 500 meter rule.

243. Kuwait Protocol, *supra* note 224, at 97–98. The Regional Organization for the Protection of the Marine Environment—Kuwait (ROPME) issued guidelines on the conduct of seismic operations during the seventh meeting of the ROPME council in February 1990. ROPME, Regional Legal Instruments, http://www.ropme.net/pages/legal.htm (last visited Feb. 8, 2009).

244. *See* PATIN, *supra* note 19, at 62–63.

245. *See, e.g.*, JOINT NATURE CONSERVATION COMM., GUIDELINES FOR MINIMISING ACOUSTIC DISTURBANCE TO MARINE MAMMALS FROM SEISMIC SURVEYS (2004), http://www.jncc.gov.uk/pdf/Seismic_survey_guidelines_200404.pdf.

246. *Id.*

247. *Id.* § 1.

248. *Id.* § 3.

249. *Id.* § 2.

3. Siting of Installations

Article V of the Kuwait Protocol requires states to consider the impact of offshore installations on lawful navigation, fishing and existing subsea infrastructure such as cables and pipelines.[250] It also briefly mentions taking steps to protect "sites of special ecological and cultural interests."[251]

These siting concerns are reasonable, and should be included in the licensing process. However, the Kuwait framework could be enhanced regarding its protection of "specially protected areas" as defined by Article 11 of the Abidjan Convention.[252] In contrast to the Kuwait Protocol, the Mediterranean Offshore Protocol devotes a full article to specially protected areas.[253] For proposed operations in such areas, the Mediterranean Offshore Protocol requires performing an EIA; it also includes special provisions for monitoring, removal of installations, and more stringent discharge prohibitions.[254] These Mediterranean Offshore Protocol provisions should be incorporated into an offshore protocol for the Abidjan Convention.

4. Safe and Fit for Purpose

Article VI of the Kuwait Protocol requires each state to ensure that every offshore installation in its jurisdiction has been certified as safe and fit for purpose.[255] However, the Gulf of Guinea states do not have the bureaucratic resources to oversee a broad field certification program.[256] Even if the protocol requires certification by a third party, the states would be hard-

250. Kuwait Protocol, *supra* note 224, at 94.

251. *Id.*

252. Abidjan Convention, *supra* note 167, at 749.

253. Mediterranean Offshore Protocol, *supra* note 224, art. 21.

254. *Id.*

255. Kuwait Protocol, *supra* note 224, at 94.

256. *See generally* Ricardo Soares de Oliveira, *Strategic Resources, International Politics, and Domestic Governance in the Gulf of Guinea*, GLOBAL PUB. POLICY INST. 179, 181 (2006) (stating that despite the booming oil industry, the Gulf of Guinea states are plagued by a record of bad governance and most are "ranked amongst the world's ten most corrupt [states] in the world").

pressed to corroborate it.[257] Thus, the protocol should only include a limited design and procedure certification process that focuses on basic safety and operability requirements, such as the ones required by Article VII of the Kuwait Protocol.[258] Article VII requires offshore operations to be in accordance with "good oilfield or other relevant industry practice".[259] The article requires blowout preventers and other safety equipment to be tested periodically, use of lights and other warning instruments, and proper training for operators.[260] All these should be incorporated into an offshore protocol for the Abidjan Convention in the form of a basic certification process that looks at whether the design and relevant procedures are consistent with good oilfield and other relevant industry practice. This process should be administered by UNEP. The protocol should also reiterate that all oil tankers and transport vessels used in the area must comply fully with applicable MARPOL requirements.

Requirements for FPSOs should also be added. As discussed earlier, most of the MARPOL oil tanker requirements do not apply to FPSOs.[261] Consequently, old single hull oil tankers could be converted to FPSOs.[262] Thus, even a small collision could result in a large release of oil from a single hull FPSO.[263] An offshore protocol for the Abidjan Convention should require a double hull for newly built FPSOs. For existing FPSOs, the protocol should incorporate measures and plans to minimize the risk of collisions.[264]

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257. See *id.* at 181 (highlighting the corruption, problems with economic activity, and state failure present in many of the Gulf of Guinea states).

258. Kuwait Protocol, *supra* note 224, at 94–95.

259. *Id.*

260. *Id.*

261. *Guidelines for FPSOs*, *supra* note 102.

262. Richard D'Souza, *FPSO Deployment Promising for US Gulf of Mexico: Dealing with the Lack of Infrastructure*, OFFSHORE, May 01, 1999, at 62.

263. DET NORSKE VERITAS, INC., FREQUENCY ANALYSIS OF ACCIDENTAL OIL RELEASES FROM FPSO OPERATIONS IN THE GULF OF MEXICO 163 (2001), www.gomr.mms.gov/homepg/offshore/fpso/Risk_Assessment.pdf.

264. James B. Regg, *Floating Production, Storage, and Offloading Systems in the Gulf of Mexico OCS: A Regulatory Perspective*, OFFSHORE TECH. PROGRAM, May 1999, at

5. Contingency Planning

Article VIII of the Kuwait Protocol requires operators to prepare a "Contingency Plan" to deal with accidents and emergencies.[265] This requirement should be included in an offshore protocol, or the existing protocol for emergencies should be amended to include it. Either way, the language should specifically address FPSOs. More planning and resources should be required for FPSOs due to the larger potential spill volume in the case of a spill.[266]

6. Drilling Discharges[267]

The Kuwait Protocol addresses drilling discharges in Article IX.[268] The Protocol prohibits the discharge of oil-based drilling fluids, but allows the discharge of drilled rock and sand (cuttings) associated with oil-based drilling fluids.[269] The only limitation on these cuttings is that they must be "effectively treated to minimize their oil content before being appropriately disposed off [sic]."[270] By contrast, the OSPAR Commission prohibits the use of diesel-based fluids.[271] For other oil-based

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1, http://www.gomr.mms.gov/homepg/whatsnew/speeches/Otc10701.pdf (addressing standards and guidelines to minimize the risk of FPSOs in the Gulf of Mexico).

265. Kuwait Protocol, *supra* note 224, at 95.

266. DET NORSKE VERITAS, INC., *supra* note 263.

267. The three types of drilling fluids or muds are water-based, oil-based or synthetic-based (olefins or ester). PATIN, *supra* note 19, at 74. Of the three types of muds, oil-based muds have the greatest environmental harm if discharged into the environment. *Id.* at 73–74. Many drilling muds have biocides added to them, which are chemicals that prevent the development of microorganisms in the drilling mud. When discharged, these chemicals can have a lethal effect on marine life. *Id.* at 77. The impacts from drilling mud discharges are exacerbated when there are benthic communities near the area of discharge. *Id.* at 276–77. Benthic communities are composed of organisms that live in the upper layer of bottom sediments. Fathom, Deep Ocean: Session 2—Vertical Life Zones and Biodiversity,http://www.fathom.com/course/10701050/session2.html (last visited Feb. 8, 2009). Drilled rock and sand (cuttings) discharged over benthic communities can reduce the oxygen available for these organisms. PATIN, *supra* note 19, at 276.

268. Kuwait Protocol, *supra* note 224, at 96–97.

269. *Id.* at 96.

270. *Id.*

271. OSPAR Decision 2000/3 on the use of Organic-Phase Drilling Fluids (OPF) and the discharge of OPF-contaminated Cuttings, Offshore Oil and Gas Industry:

drilling fluids, the Commission limits the oil content in drill cuttings to 1% by weight on dry cuttings.[272] As another point of comparison, the Mediterranean Offshore Protocol prohibits diesel-based fluids and limits the oil-in-cuttings content for all other oil-based fluids to 100 g/Kg, or 10% by weight.[273] Because of the possible impacts on benthic communities from oily cuttings,[274] an offshore protocol for the Abidjan Convention should include a stringent but achievable limit for oil-based fluids, and a prohibition on diesel-based drilling fluids. The U.S. Environmental Protection Agency (EPA) examined different cuttings treatment systems while setting oil-in-cuttings limits and found that the 95th percentile for the best systems was below 7% by weight.[275] Therefore, a 7% by weight limit should be used for oil-based drilling fluids, along with a prohibition on use of diesel-based drilling fluids.

Article IX of the Kuwait Protocol prohibits water-based drilling fluids from containing persistent systemic toxins.[276] An offshore protocol for the Abidjan Convention should expand on this by identifying substances that cannot be used in water based muds or by limiting the amount of some toxic substances in water-based muds. For example, for the western Gulf of Mexico, the EPA limits the amount of mercury and cadmium in barite (a common drilling fluid additive).[277]

A recent development following the promulgation of the

Decisions, Recommendations and Other Agreements, OSPAR 00/20/1-E, Annex 18, June 30, 2000, http://www.ospar.org/document/dbase/decrecs/decisons/od00-03e.doc.

272. *Id.*

273. Mediterranean Offshore Protocol, *supra* note 224, Annex V.

274. *See* PATIN, *supra* note 19, at 339–40.

275. U.S. ENVTL. PROT. AGENCY, DEVELOPMENT DOCUMENT FOR FINAL EFFLUENT LIMITATIONS GUIDELINES AND STANDARDS FOR SYNTHETIC-BASED DRILLING FLUIDS AND OTHER NON-AQUEOUS DRILLING FLUIDS IN THE OIL AND GAS EXTRACTION POINT SOURCE CATEGORY VII-17 (2000), http://www.epa.gov/waterscience/guide/sbf/final/dd/finalddpart2 [hereinafter EPA DEVELOPMENT DOCUMENT].

276. Kuwait Protocol, *supra* note 224, at 97.

277. U.S. ENVTL. PROT. AGENCY, FINAL NPDES GENERAL PERMIT FOR NEW AND EXISTING SOURCES AND NEW DISCHARGERS IN THE OFFSHORE SUBCATEGORY OF THE OIL AND GAS EXTRACTION CATEGORY FOR THE WESTERN PORTION OF THE OUTER CONTINENTAL SHELF OF THE GULF OF MEXICO (2007), http://www.epa.gov/region6/water/npdes/genpermit/gmg290000finalpermit2004.pdf [hereinafter EPA PERMIT]. The permit limits mercury to 1 mg/Kg and Cadmium to 3 mg/Kg. *Id.*

Kuwait Protocol has been the creation of synthetic-based drilling fluids that have the durability of oil-based muds but have lower toxicity.[278] The OSPAR Commission set a target of 1% by weight for oil content of cuttings from synthetic-based muds.[279] If the 1% target cannot be achieved, it allows national authorities to set higher limits after a case-by-case consideration of "toxicity, biodegradability and liability to bioaccumulate of the drilling fluid concerned and of the hydrography of the receiving environment."[280] The Commission seems to have used a more lenient approach to encourage the use of synthetic-based muds over oil-based muds.[281] Following this logic, the oil-in-cuttings limit for synthetic-based muds should be higher than the corresponding oil-based mud limit. The Mediterranean Offshore Protocol sets the limit for oil-in-cuttings at 10% by weight, which is higher than the proposed limit of 7% by weight for oil-based muds.[282] Thus, 10% by weight would be a reasonable limit for synthetic-based muds in an offshore protocol for the Abidjan Convention.

7. Produced Water and Other Aqueous Discharges

Article IX of the Kuwait Protocol addresses operational discharges from offshore oil installations.[283] For discharges of produced water, the protocol requires that the oil content be no greater than 40 milligrams per liter (mg/L) as a monthly average and 100 mg/L for single sample maximum.[284] In comparison, the OSPAR Commission set a limit for oil in produced water at 30 mg/L.[285] The Helsinki Convention

278. *See generally* J.M. NEFF, S. MCKELVIE & R. C. AYERS, MINERALS MANAGEMENT SERVICE, ENVIRONMENTAL IMPACTS OF SYNTHETIC BASED DRILLING FLUIDS vii (2000), http://www.gomr.mms.gov/PI/PDFImages/ESPIS/3/3175.pdf.

279. OSPAR, *supra* note 146, at 1098.

280. *Id.*

281. *See generally id.* at preface (noting the Commission's stance on muds).

282. Mediterranean Offshore Protocol, *supra* note 224, Annex V.

283. Kuwait Protocol, *supra* note 224, at 96.

284. *Id.*

285. OSPAR Recommendation 2006/4 Amending OSPAR Recommendation 2001/1 for the Management of Produced Water from Offshore Installations, Offshore Oil and Gas Industry: Decisions, Recommendations and Other Agreements, OSPAR 06/23/1-

suggests a limit of 15 mg/L for produced water but allows 40 mg/L if 15 mg/L cannot be met.[286] Thus, 40 mg/L for produced water seems to be a reasonable maximum for an offshore protocol.

With the exception of machinery space drainage in "Special Area[s]", the Kuwait Protocol treats all other discharges not associated with drilling the same as produced water (40/100 mg/L) limits.[287]

However, other regional instruments suggest that such discharges should be treated differently. The Mediterranean Offshore Protocol, for example, requires that all machinery space drainage be limited to a maximum of 15 mg/L.[288] In the U.S. portion of the western Gulf of Mexico, the EPA limits most operational discharges to a no sheen limit.[289] A West Africa offshore protocol need not go that far but should at least expand the 15 mg/L machine space drainage limitation to all areas, not just specially protected ones.

8. Garbage and Sewage

Regarding garbage and sewage, the Kuwait Protocol essentially recites the existing requirements under MARPOL 73/78 and the London Convention.[290] Similarly, a new Abidjan protocol should: (1) reiterate the prohibition against the intentional dumping of wastes covered by the London Protocol;[291] (2) reiterate the limitations on discharge of sewage under MARPOL Annex IV;[292] and (3) reiterate the prohibition

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E, Annex 15, June 30, 2006, http://www.ospar.org/documents/dbase/decrecs/recommendations/06-04e_Rec%20amending%20Rec%2001-1.doc.

286. 1992 Convention, *supra* note 154, at 229.

287. Kuwait Protocol, *supra* note 224, at 96.

288. Mediterranean Offshore Protocol, *supra* note 224, art. 10.

289. EPA PERMIT, *supra* note 277.

290. Kuwait Protocol, *supra* note 224, at 97.

291. Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter, 1972 and its 1996 Protocol, LC-LP.1/Circ.22, http://www.imo.org/blastDataOnly.asp/data_id%3D22916/22.pdf.

292. MARPOL 73/78, *supra* note 38, Annex IV.

against the discharge of Garbage under MARPOL Annex V.[293] All these requirements are for the most part widely accepted principles.

9. Chemical Use

Article XI of the Kuwait Protocol requires operators of offshore installations to prepare a "Chemical Use Plan".[294] Such plan must identify chemicals to be used, maximum concentrations, and discharge location.[295] The Protocol gives the competent state authority the power to regulate further.[296] Such a requirement appears reasonable and should also be included in any future Abidjan offshore protocol.

10. Flaring

Atmospheric emissions from oil and gas activities also impact the environment.[297] From that standpoint, the main impact is emission of greenhouse gases from flaring and venting.[298] As previously mentioned, Nigeria's flaring from oil and gas activities, some of it offshore, is of global proportions.[299]

Despite its significance, not much attention has been given to the issue of flaring from offshore operations.[300] The Kuwait Protocol is silent on this issue.[301] However, it is fair to say that these impacts will be studied more as global agreements on climate change are implemented in the future.[302]

In the U.S. Outer Continental Shelf, flaring and venting must be documented and reported to the Minerals Management

293. *Id.* Appendix V.

294. Kuwait Protocol, *supra* note 224, art. XI.

295. *Id.*

296. *Id.*

297. PATIN, *supra* note 19, at 82–85.

298. *Id.* at 82.

299. *Hearing*, *supra* note 45, at 50 (statement of J. Stephen Morrison, Director of Africa Programs, Center for Strategic and International Studies).

300. PATIN, *supra* note 19, at 82.

301. Kuwait Protocol, *supra* note 224, at 97–98.

302. *See* Hickey, *supra* note 26, at 17.

Service.[303] Prior government approval is required in some situations where the flaring would exceed a defined number of hours.[304] The regulations also require consideration of the effect on onshore areas.[305]

A future offshore Abidjan protocol should require that the vast majority of produced gas be either sold to market or reinjected into the underground formation. Flaring and venting should be mostly for emergency venting and operational safety. Prior government approval should be required for continuous flaring or venting of produced gas, unless in quantities authorized by national regulation. Such an approach prevents wasteful disposition of resources while minimizing environmental risks.[306]

The protocol should also require states to cooperate in performing more scientific studies on the flaring issue. In addition to greenhouse gas emissions, such studies should also look at possible harm to coastal areas from unburned hydrocarbon emissions and smoke.[307]

11. Decommissioning

After offshore oil and gas production ceases, the remaining environmental issue is what to do with abandoned platforms.[308] There are somewhere between 380 and 547 major offshore oil and gas structures in West Africa.[309] Plans must be in place about what to do once operation of these structures is no longer commercially viable.[310]

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303. 30 C.F.R. § 250.1105 (2007). The main driving factor appears to be prevention of resource loss rather than environmental risk mitigation. *Id.*

304. *Id.* In addition, where the operator wants to flare or vent produced gas from low-pressure storage and production vessels in quantities over 50 thousand cubic feet per day, the flaring or venting is only allowed if gas recovery is determined to be "small and uneconomic". NTL No. 2006-N06 (Dec. 19, 2006).

305. 30 C.F.R. § 250.1105.

306. *Id.*

307. *See, e.g.*, Control of Emissions From New Marine Compression-Ignition Engines at or Above 30 Liters per Cylinder, 72 Fed. Reg. 235, 69,522 (Dec. 7, 2007).

308. AYOADE, *supra* note 52, at 1–7.

309. *Id.* at 75.

310. *See id.* at 5.

Article XIII of the Kuwait Protocol addresses decommissioning of offshore facilities.[311] The Protocol requires removal of offshore installations in two situations: for the safety of navigation and to protect fishing. The Protocol also prohibits the deposition of abandoned platforms on the seabed of the continental shelf.[312] However, abandoned platforms have been successfully converted into subsea artificial reefs in the Gulf of Mexico.[313] Thus, a future Abidjan offshore protocol could prohibit seabed deposition of abandoned offshore platforms unless the operator obtains a license to do so from the competent state authority. An EIA should be required as part of this licensing process.

12. Discharge Data Reporting

The Kuwait Protocol does not include a requirement to report discharge information.[314] However, discharge and release reporting can be an effective tool to compel environmental compliance.[315] The protocol should include a requirement for operators to submit discharge information to the jurisdictional state. The state should then be required to make the data available to the public. Releasing this data would allow international NGOs to apply public pressure for continual improvement.[316] For situations where the state environmental agency does not have the resources to manage the data, the protocol should allow for an international organization to fill that void.[317] UNEP would be best suited for the role because of its past involvement with the Abidjan Convention.[318]

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311. Kuwait Protocol, *supra* note 224, art. XIII.

312. *Id.* at 98.

313. LES DAUTERIVE, MMS RIGS TO REEFS POLICY, PROGRESS AND PERSPECTIVE 5 (2000), http://www.gomr.mms.gov/PDFs/2000/2000-073.pdf.

314. Kuwait Protocol, *supra* note 224, at 93–98.

315. ROBERT V. PERCIVAL ET AL, ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 302–04 (5th ed. 2006).

316. *Developments in the Law—International Environmental Law*, 104 HARV. L. REV. 1484, 1565 (1991).

317. *Id.* at 1563–65.

318. UNEP currently serves as the Secretariat for the Abidjan Convention. United Nations Environment Programme, The Convention, http://www.unep.org/Abidjan Convention/The_Convention/index.asp.

VI. OBSTACLES TO DEVELOPMENT AND IMPLEMENTATION OF AN OFFSHORE PROTOCOL

As previously mentioned, the Abidjan Convention has suffered from slow implementation in the past.[319] However, there appears to be a recent effort to push its agenda forward.[320] Still, significant obstacles remain to the further development of the convention and any associated future protocols.[321] A recent assessment of the Abidjan Convention implementation found concerns related to funding, coordination, and limited human resources.[322] The development and implementation of an offshore protocol will likely face the same obstacles. Efforts to address the funding issue are underway following the Abidjan Convention Joint Conference of Parties.[323] The other two concerns are perhaps more complex.

The significant obstacles to further implementation of the Abidjan Convention program translate into a lack of commitment. To illustrate, there are several countries, including Angola, that have yet to ratify the Abidjan Convention.[324] There is a feeling among some diplomats that countries may be suffering from "international agreement fatigue."[325] Countries also have to prioritize how to spend their limited government resources and may choose to address other problems.[326]

The way to surpass these obstacles may lie in finding ways to pool resources. There are already several marine ecology projects underway in the region under the auspices of UNEP, as well as Commissions set up for each of the three "Large Marine Ecosystems."[327] Coordinating these ongoing activities with the

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319. REGIONAL PROFILE, *supra* note 63, at 27–31.

320. UNEP, *Report of the Executive Director of the United Nations Environment Programme to the Eight Meeting of the Contracting Parties to the Abidjan Convention*, paras. 40–42, UNEP(DEPI)/WAF/CP.8/3 (Aug. 10, 2007) [hereinafter *UNEP Report*] (last visited Feb. 8, 2009).

321. CURRIE ET AL., *supra* note 124, at 30.

322. *Id.*

323. *UNEP Report*, *supra* note 232, para. 41.

324. Abidjan Convention Contracting Parties, *supra* note 201.

325. CURRIE ET AL., *supra* note 124, at 30.

326. *Id.* at 30, 31.

327. UNEP Report, *supra* note 321, para. 40.

Abidjan Convention program would provide a way to share knowledge and personnel, thus preventing duplicate efforts. These efforts could also help alleviate the current need for marine pollution monitoring and enforcement by pooling available resources.[328]

Efforts to regulate offshore discharges also need to be coordinated with the recently established Gulf of Guinea Commission.[329] Created in 2003, the Gulf of Guinea Commission has as its purpose the protection of the region's energy resources.[330] Recently, Nigeria's president called on this Commission to "move fast to secure the region's energy resources to benefit their peoples" and to holistically address environmental issues arising from their exploitation.[331]

Although establishment of the Gulf of Guinea Commission is a good development, it cannot address pollution from offshore activities by itself. First of all, it has a limited membership—eight countries.[332] Membership seems to be limited to those countries with the most oil producing potential.[333] However, a major pollution event from offshore E & P could affect other countries in the area that do not have as many oil resources.[334] Thus, the Commission's efforts may be seen as lacking legitimacy if the body itself only consists of the producers.[335] In addition, the Commission is still finding its place and figuring

328. CURRIE ET AL., *supra* note 124, at 31–32.

329. FOREST & SOUSA, *supra* note 28, at 161.

330. *Id.* at 161. The Commission has eight members and recently established a headquarters in Luanda. GulfOilandGas.com, *Gulf of Guinea Oil Grp Moves Ahead; Has 5% of World Output*, http://www.gulfoilandgas.com/webpro1/main/mainnews.asp?id=3487 (last visited Feb. 8, 2009).

331. *Nigerian President Calls for Urgent Action in Gulf of Guinea*, EARTH TIMES, Sept. 6, 2007, http://www.earthtimes.org/articles/show/103354.html.

332. FOREST & SOUSA, *supra* note 28, at 161.

333. GulfOilandGas.com, *supra* note 330.

334. *See supra* pp. 17–18.

335. *See, e.g.*, L. Chinedu Arizona-Ogwu, *Nigeria And The Multinationals' Intention: Oil Interest Or Social Influence?*, NIGERIANS IN AMERICA, Aug. 18, 2008, http://www.nigeriansinamerica.com/articles/2824/2/Nigeria-And-The-Multinationals-Intention-Oil-Interest-Or-Social-Influence/Page2.html (showing how oil producing countries are prone to governmental corruption).

out its purpose.[336] Also, the other goals of the Commission may "swallow up" the environmental aspect.[337] Such issues could include: security concerns; agreements on offshore lease delineation; controlling the influence of consumer countries in the region, such as China; oversight of anticorruption initiatives; and other economic considerations.[338] Finally, the Commission's goal of producing oil for the benefit of the people might conflict with environmental considerations that may require reduced or no activity in sensitive marine areas or other restrictions that could limit the amount of oil recovered and the speed of development.[339] Still, the Commission could foster regional cooperation in an area that has historically suffered from mutual mistrust.[340] The Commission could also push its agenda forward by supporting the development of an offshore protocol for the Abidjan Convention.

Continuing UNEP involvement is an additional key to surpassing any obstacles. UNEP currently fulfills the role of Secretariat for the Abidjan Convention.[341] However, efforts are currently underway to transfer the Secretariat function from UNEP to Cote d'Ivoire.[342] While this would be a positive development regarding regional revitalization of the Convention, there is still a significant role for UNEP to play if an offshore

336. *See, e.g.*, Emmanuel Kendemeh, *West Africa: Gulf of Guinea Commission Goes Functional*, CAMEROON TRIBUNE, Aug. 28, 2006, http://www.afrika.no/Detailed/12644.html (detailing how the Gulf of Guinea Commission was still defining itself as a functional body many years after the group's creation).

337. *See generally* RAYMOND GILPIN, CTR. FOR CONTEMPORARY CONFLICT, ENHANCING MARITIME SECURITY IN THE GULF OF GUINEA (2007) (explaining the Gulf of Guinea Commission's commitment to a variety of important and broad issues).

338. *See id.* (explaining the solidified role of the Gulf of Guinea Commission).

339. *See* W. CORBETT DABBS, OIL PRODUCTION AND ENVIRONMENTAL DAMAGE (1996) http://www.american.edu/TED/projects/tedcross/xoilpr15.htm (last visited Feb. 8, 2009) (explaining how oil production conflicts with environmental issues).

340. *See* FOREST & SOUSA, *supra* note 28, at 99, 100 (showing the unrest in the Gulf of Guinea).

341. The Convention, *supra* note 318.

342. United Nations Environment Programme, Update on the Special Conference of Contracting Parties of the Abidjan Convention COP 9, http://www.unep.org/AbidjanConvention/COP_9/index.asp (last visited Feb. 8, 2009).

protocol is to be successful.[343] One area of continued UNEP involvement would be to help states in gathering and analyzing environmental data.[344] Another key area is to provide training of state environmental officials.[345] For an offshore protocol to succeed, it is critical that states have adequate knowledge and resources to implement and enforce the requirements. This includes enacting national laws that complement the offshore protocol, monitoring ongoing operations, and enforcing laws against repeat offenders. The states must have trained officials if the protocol is to achieve its goals.[346] UNEP has the expertise and regional involvement to provide this training.

VII. CONCLUSION

Oil and gas E & P in the Gulf of Guinea is in some ways only just beginning. More projects are likely to follow in coming years.[347] Offshore E & P may eventually encompass the rest of the West Africa coastal area. The speed of this development will be fast if the price of oil stabilizes at reasonably high levels.[348] Unfortunately, the law seldom adapts so quickly to change.[349]

The current global environmental law framework has significant gaps regarding offshore E & P. These gaps must be filled by regional, multinational, and national legal frameworks. A regional approach is the most promising because it maximizes efficiencies and benefits.

For the Gulf of Guinea and the greater West Africa region, the best regional approach is to develop and implement a protocol for offshore E & P activities under the Abidjan

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343. *See Developments in the Law*, *supra* note 316, at 1564–65 (showing the benefits of a centralized international agency).

344. *See id.* at 1565 (describing the role that a centralized monitoring system could have).

345. *Id.* at 1576.

346. *See id.* (emphasizing the need to train state officials).

347. Misereor, Oil in the Gulf of Guinea, http://www.misereor.org/en/issues-themes/resources-and-energy/oil-in-the-gulf-of-guinea (last visited Feb. 8, 2009).

348. *Id.*

349. *See, e.g.*, Andrew C. Revkin, *Panel of Experts Find That Anti-Pollution Laws are Outdated*, N.Y. TIMES, Jan. 30, 2004, at A15 (showing how U.S. environmental laws have failed to keep up).

Convention. Such a protocol could address all the environmental risks associated with offshore E & P activities. That effort would support the Convention's overall goal: protection of the marine and coastal environment of West and Central Africa.

There is no question that offshore E & P will play a significant part in allowing us to meet our current and future energy demands. The concern is whether it can help us achieve energy security and economic progress without sacrificing the environment. Appropriate regulatory controls are necessary to achieve the right balance between economic development and environmental protection. The selected regulatory controls must require sustainable development of offshore oil and gas resources. Only when sustainability is achieved can we ensure that in the process we do not jeopardize the next generation's right to a healthy environment.

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