

# The New Wave of Florida Energy: The Regulatory Path to Harnessing Marine Hydrokinetic Power

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**Andrew Thornquest \***

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## I. INTRODUCTION

American and international scientific groups have come to a consensus that human-induced climate change is a reality largely stemming from carbon-emissions.<sup>1</sup> Major international policy-making groups have believed this for years.<sup>2</sup> Florida and its miles of coastline are particularly endangered by climate change, as sea level rise has already begun to impact parts of the State.<sup>3</sup> At the same time, just off the shore of these threatened Florida beaches lies an untapped carbon-neutral energy source: marine hydrokinetic energy, more commonly referred to as wave energy. The Florida Department of Agriculture and Consumer Services' Office of Energy has identified wave energy as a major potential source of renewable energy for Florida.<sup>4</sup> Compared to the more commonly known renewable energy sources like wind and solar, wave energy is still in its infancy. However, various types of wave energy projects are being tested in Europe and America which are bringing this technology up to

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1. Fred Krupp, *A New Climate Change Consensus*, Wall Street Journal (Aug. 6, 2012) (available at <http://online.wsj.com/article/SB10000872396390444320704577569231537988226.html>).

2. IPCC, *2007: Summary for Policymakers*, In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, (S. Solomon et al. eds., IPCC 2007) (available at <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf>).

3. Curtis Morgan, *Rising Sea Comes at a Cost for South Florida Cities*, Miami Herald (Sept. 1, 2012) (available at <http://www.miamiherald.com/2012/09/01/2980388/rising-sea-come-at-a-cost-for.html>).

4. Fla. Dept. of Agric. & Consumer Serv., *Office of Energy Annual Report* (2011) (available at [http://www.freshfromflorida.com/offices/energy/docs/Office\\_of\\_Energy\\_Annual\\_Report\\_2011.pdf](http://www.freshfromflorida.com/offices/energy/docs/Office_of_Energy_Annual_Report_2011.pdf)).

speed with the more common renewable energy sources<sup>5</sup> In fact, Florida has just begun its first marine hydrokinetic energy project, through Florida Atlantic University (FAU), to determine how viable wave energy is for the state.<sup>6</sup>

Despite support for wave energy in Florida, the reality of economically converting marine hydrokinetic energy into electricity is still far off, due mostly to complicated permitting and regulatory schemes.<sup>7</sup> It is imperative for Florida and the Federal Government to come together and streamline their regulatory schemes for wave energy for Florida to embrace an energy source that can use the ocean's vast power.

This paper addresses wave energy's viability today and how Florida can encourage its development in the future. Part II will review the current state of wave energy technologies while Part III will specifically focus on FAU's current wave energy project that is in the initial permitting stages. FAU's project is used as an example of how wave energy projects are being developed in Federal waters. Part IV will detail Florida's regulation of wave energy projects. Finally, Part V will explore ways Florida and the Federal government can coordinate to encourage more wave energy projects off the shores of Florida's coast.

## II. MARINE HYDROKINETIC ENERGY TECHNOLOGY

In order to know how to improve wave energy, one must first understand what the state of marine hydrokinetic energy is today. Marine hydrokinetic energy, understood in the most basic sense, is a technology that captures energy from waves or from wind currents passing over the surface of the ocean.<sup>8</sup> Because waves are constantly rolling in coastal and offshore regions, wave energy is a viable energy source 24 hours a day,

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5. U.S. Dept. of the Int. Minerals Mgmt. Serv., *Technology White Paper on Wave Energy Potential on the Outer Continental Shelf 2* (2006) (available at [http://www.camelottech.com/CMFiles/Docs/OCS\\_EIS\\_WhitePaper\\_Wave.pdf](http://www.camelottech.com/CMFiles/Docs/OCS_EIS_WhitePaper_Wave.pdf)).

6. U.S. Dept. of the Int. Bureau of Ocean Energy Mgmt., *Marine Hydrokinetic Technology Testing on the Outer Continental Shelf Offshore Florida* (May 9, 2012) (available at [http://www.boem.gov/uploadedFiles/BOEM/Renewable\\_Energy\\_Program/State\\_Activities/FAU\\_InfoSession\\_EA\\_050912.pdf](http://www.boem.gov/uploadedFiles/BOEM/Renewable_Energy_Program/State_Activities/FAU_InfoSession_EA_050912.pdf)).

7. Fla. Dept. of Agric. & Consumer Serv., *supra* n. 4.

8. Ocean Energy Council, *Wave Energy Frequently Asked Questions*, <http://www.oceanenergycouncil.com/index.php/Wave-Energy/Wave-Energy.html> (accessed Dec. 11, 2012).

365 days a year.<sup>9</sup> While the intensity of wave energy varies with the size and duration of the waves, wave activity can accurately be predicted several days in advance.<sup>10</sup> Additionally, wave energy is an affordable source of energy with an average rate of seven and a half cents per kilowatt-hour (kWh).<sup>11</sup> In comparison, wind energy is approximately four and a half cents per kWh while large scale coal burning plants cost about two and a half cents per kWh.<sup>12</sup> Plus, wave energy production does not release carbon emissions like fossil fuels, or require nearly as much land area as wind energy.<sup>13</sup> Finally, wave energy is relatively abundant, with an estimated 23 gigawatts (GW) of wave energy available in the offshore regions of the United States.<sup>14</sup>

#### A. Methods of Collecting Marine Hydrokinetic Energy

There are currently four methods used to convert wave swells into useable energy: (1) terminator devices; (2) attenuator devices; (3) point-absorbers; (4) overtopping devices. Each of the four has distinct ways to convert energy, yet all four are very new technologies. The first three of the four listed-devices consist of an energy converting module that floats at or near the surface of the ocean, which is anchored by cables to the ocean floor.<sup>15</sup> The terminator devices have traditionally been located near the shore, but advances in technology now allow designs for terminator devices that will be located far offshore.<sup>16</sup> Existing attenuator devices in Europe have been placed near the shore, ranging from one to ten kilometers out in the ocean.<sup>17</sup> Point-absorbers are normally placed in

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9. *Id.*

10. U.S. Dept. of the Int. Minerals Mgmt. Serv., *supra* n. 5, at 2.

11. Ocean Energy Council, *supra* n. 8; U.S. Dept. of the Int. Minerals Mgmt. Serv., *supra* n. 5. The Ocean energy council has based their estimates on marine hydrokinetic energy projects currently running in the United Kingdom, while BOEM's numbers have used the UK numbers, but have largely supplemented them with a private study done by the Electric Power Research Institute off the coast of California.

12. *Id.*

13. *Id.*

14. *Id.*

15. U.S. Dept. of the Int. Minerals Mgmt. Serv., *supra* n. 5, at 3-7.

16. *Id.* at 3.

17. *Id.* at 5; Pelamis, *ScottishPower Renewables*, <http://www.pelamiswave.com/our-projects/project/2/ScottishPower-Renewables-at->

between the distances of terminators and attenuators, with experimental versions in the United States being placed roughly three miles off the coast.<sup>18</sup> Conversely, over-topping devices are wall-like structures placed in the surf, almost directly on-shore.<sup>19</sup> Regardless, each technology has a unique way of converting energy from the waves and currents of the seas.

### 1. Terminators

Terminator devices are normally used for near-shore collection of marine hydrokinetic energy, but in rare instances, some have been used in offshore collection.<sup>20</sup> Water enters the floating terminator through a submerged opening, trapping the air inside and pushing it up along with the level of the water, which in-turn pushes a turbine as the wave flows by.<sup>21</sup> One terminator device recorded twenty kWh of energy on average for a year along the California coast in a 2005 study, which priced the energy production at ten cents per kWh if used for consumer energy.<sup>22</sup> Estimations using this data, show a commercial project using multiple terminator devices in one area could produce up to 300,000 megawatts per hour (MWh).<sup>23</sup> The project will need underwater energy lines to send the energy produced from terminator devices to onshore storage and distribution centers.<sup>24</sup>

### 2. Attenuators

Attenuators are similar to terminator devices in that they use the rise and fall of the water level with each passing wave swell to drive a turbine like a piston.<sup>25</sup> The attenuators are anchored to the sea floor and sit atop the surface in long floating pontoons, oriented parallel to the motion of the waves.<sup>26</sup> When the wave swells pass through the devices, fore and

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EMEC; Pelamis, *CEO at Agucadoura*, <http://www.pelamiswave.com/our-projects/project/6/CEO-at-Agucadoura>, (accessed Jun 26th, 2013).

18. U.S. Dept. of the Int. Minerals Mgmt. Serv., *supra* n. 5, at 6.
19. *Id.* at 7.
20. *Id.* at 3.
21. *Id.*
22. *Id.* at 4.
23. *Id.*
24. Ocean Energy Council, *supra* n. 8.
25. *Id.*
26. U.S. Dept. of the Int. Minerals Mgmt. Serv., *supra* n. 5, at 4.

aft pontoons connected to a center pontoon with a bending joint rise and fall, and this rise and fall powers hydraulic pumps.<sup>27</sup> Unlike the terminators, attenuators are increasingly being used offshore of Scotland and Portugal and are developing commercial capacity.<sup>28</sup> The private company Pelamis's wave energy project off the shore of Portugal had the capacity to power 1,500 family homes in 2008 without the full number of attenuators from the planned installation.<sup>29</sup> Once completed, the Pelamis project will produce 21 MW of power.<sup>30</sup> A rate of ten cents per kWh is predicted for this type of technology on the west coast of the United States.<sup>31</sup>

### 3. Point Absorbers

Point absorber wave energy converters have a much smaller surface area than terminators and attenuators and collect their energy from a single point in wave swells.<sup>32</sup> The point absorber wave energy converter uses a floating buoy inside a fixed chamber that rises and falls with the wave currents powering electromechanical or hydraulic converters inside the apparatus.<sup>33</sup> Point absorbers are the technology of choice for the FAU wave energy project;<sup>34</sup> the current ceiling on the energy production potential of this kind of wave energy conversion is a one point twenty-five megawatt capacity commercial project off the coast of Spain.<sup>35</sup>

### 4. Overtopping Device

Overtopping devices act like miniature dams by using the force of the waves to push water into an elevated reservoir, then releasing the

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27. *Id.*

28. *Pelamis, supra* n 17.

29. Alok Jha, "Wave Snakes" Switch on to Harness Ocean's Power, <http://www.guardian.co.uk/environment/2008/sep/24/renewable.wave.energy.portugal> (Sept. 24, 2008).

30. *Id.*

31. U.S. Dept. of the Int. Minerals Mgmt. Serv., *supra* n. 5, at 5.

32. *Id.*

33. *Id.*

34. Susan H. Skempf, et. al. , *Southeast National Marine Renewable Energy Center*, Florida Energy Systems Consortium Annual Report, 273 (Nov 2011).

35. U.S. Dept. of the Int. Minerals Mgmt. Serv., *supra* n. 5, at 6.

collected reservoir waters back to the surface of the sea.<sup>36</sup> When the reservoir releases its cache, gravity pulls the falling water over turbines which spin and generate energy just like hydropower dams.<sup>37</sup> Due to the aggregation of many different waves into the reservoir, overtopping devices have the unique advantage of being able to produce higher amounts of energy than the strength of the energy the wave swells are carrying.<sup>38</sup> A 7 MW capable overtopping device, the WaveDragon™, has been tested off the coast of Wales, and an 11 megawatt version is available.<sup>39</sup> Normally, these types of wave energy converters are found in coastal, near-shore zones, but floating offshore versions exist as well.<sup>40</sup>

### *B. Environmental Impact*

No matter which wave energy converting technology a project uses, marine hydrokinetic energy offers many environmental benefits and relatively few drawbacks. When a developer proposes a test site or commercial wave energy farm in an offshore area, the environmental concerns include: visual and noise nuisances, wave reduction, marine animal and plant life impacts, marine habitat impacts, pollution discharge from construction, repair, and decommission, and surface use problems.<sup>41</sup>

#### *1. Impacts on Humans*

The main concerns for the human environment will be nuisance and land use related. Six factors determine how intense nuisance impacts will be from a wave energy project: (1) offshore distance of the project, (2) elevation of the shoreline observer, (3) weather conditions on the coast, (4) size and design of the devices, (5) color contrast between the devices and the water, and (6) the presence of other artificial devices in the sea and along the horizon.<sup>42</sup> Most wave energy converters have above-

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36. *Id.* at 7.

37. Ocean Energy Council, *supra* n. 8.

38. U.S. Dept. of the Int. Minerals Mgmt. Serv., *supra* n. 5, at 7.

39. *Id.*

40. *Id.*

41. *Id.* at 8.

42. George Hagerman, *Offshore Wave Power in the US: Environmental Issues* 18 (Electric Power Research Institute Dec. 21, 2004) (available at [http://oceanenergy.epri.com/attachments/wave/reports/007\\_Wave\\_Envr\\_Issues\\_Rpt.pdf](http://oceanenergy.epri.com/attachments/wave/reports/007_Wave_Envr_Issues_Rpt.pdf)).

water portions that need to be marked with highly visible paint and flashing lights, and have moving parts that emit mechanical sounds.<sup>43</sup> Fortunately, except on very clear days, most coastal communities' views will likely not be inconvenienced by wave energy devices because wave technologies must generally be located so far offshore.<sup>44</sup> Additionally, any cacophonous noises can be all-but-eliminated by careful design and acoustic muffling.<sup>45</sup>

As for the surface use impacts; shipping, recreational fishing, and commercial fishing industries could be affected by the use of ocean surface by the wave energy converters resulting in shifts in navigational paths to get to fishing grounds.<sup>46</sup> But, on the other hand, certain fish species will be attracted to the devices, benefitting the fishing industries by adding to the number of available fish.<sup>47</sup> Wave energy projects may also conflict with lucrative fossil fuel production that occurs along the coastal regions of the continental shelf.<sup>48</sup> Early consultations with existing or foreseeable future fishing, shipping, and fossil fuel projects could help avoid such conflicts.<sup>49</sup> Fortunately, marine hydrokinetic energy conversion requires almost no on-shore land use besides transmission lines, and only uses 1/200th the land area of wind energy projects.<sup>50</sup> Overall, the nuisance and land use impacts are minimal and are largely avoidable with proper planning.

## 2. Impacts on Marine Plants and Animals

On the other hand, the marine life environment will face more severe impacts from wave energy farms and projects than humans. Even though migratory species are only near wave energy project sites temporarily, this brief interaction can have negative results. While the noise above water will not be a large problem for humans, Underwater noise and electromagnetic frequencies could severely impact marine

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43. U.S. Dept. of the Int. Minerals Mgmt. Serv., *supra* n. 5, at 8.
  44. *Id.*
  45. Hagerman, *supra* n. 42 at 20.
  46. U.S. Dept. of the Int. Minerals Mgmt. Serv., *supra* n. 5, at 9.
  47. *Id.*
  48. Hagerman, *supra* n. 42 at 21.
  49. *Id.*
  50. Ocean Energy Council, *supra* n. 8.

mammals, like whales and dolphins, and some fish species.<sup>51</sup> Also, the above water lights and exposed surfaces could cause confusion and bird-strikes in the case of migratory sea-birds.<sup>52</sup> The wave energy devices themselves pose a special threat to whale migratory paths, as species like the gray whale travel close to the shore when migrating.<sup>53</sup> Large-scale marine hydrokinetic projects will force these migrating whales to swim around the project area, which takes these animals out of their instinctual migration paths.<sup>54</sup>

Plant and animal habitat will be affected too. The wave energy structures may decrease wave activity and alter erosion and sediment build-up cycles for near shore habitats, while the cables and floating energy devices may alter the ocean column just above the sea floor.<sup>55</sup> The decreased wave activity could cause algae species that are generally deterred by wave motion to grow.<sup>56</sup> During installation, maintenance, and decommissioning of the energy devices, oil, mechanical lubricants, sediment, and toxic chemicals could spill into the surrounding waters, harming nearby species.<sup>57</sup> These sea-floor disturbances are particularly dangerous for benthic marine life such as corals, sponges, and plants, which could be impacted for the duration of the wave energy project.<sup>58</sup>

Common to all of these impacts, positive and negative, is the need for further study of wave energy projects. Marine hydrokinetic energy is an emerging technology with very few projects in the United States; thus, there are only a few site specific environmental impact studies from these widely varying projects available as reference.<sup>59</sup> What is known, though, is that if wave energy projects catch on as a mainstream energy producer,

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51. George W. Boehlert et. al., *Ecological Effects of Wave Energy Development in the Pacific Northwest*, NOAA Technical Memorandum NMFS-F/SPO-92, at 60 (Oct. 11-12, 2007) (available at <http://spo.nmfs.noaa.gov/tm/Wave%20Energy%20NOAATM92%20for%20web.pdf>).

52. *Id.*

53. Hagerman, *supra* n. 42, at 9.

54. *Id.* at 11.

55. *Ecological Effects of Wave Energy Development in the Pacific Northwest*, at 70 *supra* n. 51.

56. Hagerman, *supra* n. 42, at 13.

57. *Ecological Effects of Wave Energy Development in the Pacific Northwest*, *supra* n. 51.

58. Hagerman, *supra* n. 42, at 11.

59. U.S. Dept. of the Int. Minerals Mgmt. Serv., *supra* n. 5 at 9.

the cumulative effects of multiple wave energy converters along our coasts will need to be monitored and managed.<sup>60</sup>

### III. FEDERAL REGULATION FOR FLORIDA MARINE HYDROKINETIC ENERGY

#### A. FAU Wave Energy Project

One of the few marine hydrokinetic energy projects in the United States is located 12 miles off the coast of Fort Lauderdale, Florida, and run by the Southeast National Marine Renewable Energy Center (SNMREC) out of the FAU.<sup>61</sup> This test project is the first of its kind in the state, and serves as a great real world example of the extensive federal regulations and multiple agencies involved in permitting a wave energy project. Because this project is seaward of Florida's 3 mile territorial sea boundary, it is on federal submerged lands as defined by the Outer Continental Shelf Lands Act; therefore, the project will be subject to Federal regulations.<sup>62</sup> However, Florida laws and regulations will still influence this project.<sup>63</sup>

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60. Ecological Effects of Wave Energy Development in the Pacific Northwest, *supra* n. 51.

61. Fla. A. U., *Project Application to the U.S. Department of the Interior Bureau of Ocean Energy Management, Regulation and Enforcement* (Aug. 23, 2011) (available at [http://www.boem.gov/uploadedFiles/BOEM/Renewable\\_Energy\\_Program/State\\_Activities/FAU-SNMREC%20Full%20REP%20IP%20Lease%20Project%20Application.pdf](http://www.boem.gov/uploadedFiles/BOEM/Renewable_Energy_Program/State_Activities/FAU-SNMREC%20Full%20REP%20IP%20Lease%20Project%20Application.pdf)).

62. Outer Continental Shelf Lands Act, 43 U.S.C. §§ 1331(a) (2006). This section of OCSLA defines the term 'outer Continental Shelf' means all submerged lands lying seaward and outside of the area of lands beneath navigable waters as defined in section 1301 of this title, and of which the subsoil and seabed appertain to the United States and are subject to its jurisdiction and control, Section 1301 of the "Submerged Lands Act" defines "lands beneath navigable waters" as follows: (2) all lands permanently or periodically covered by tidal waters up to but not above the line of mean high tide and seaward to a line three geographical miles distant from the coast line of each such State and to the boundary line of each such State where in any case such boundary as it existed at the time such State became a member of the Union, or as heretofore approved by Congress, extends seaward (or into the Gulf of Mexico) beyond three geographical miles."Florida has an unusual state boundary line for territorial waters, because on the Gulf of Mexico coast, the territorial line extends 3 leagues off the coast, and not 3 miles. This abnormality was spawned from the case *U.S. v. Louisiana*, 364 U.S. 502 (1960), which required the Supreme Court to construe

Developers of the SNMREC project proclaim their mission is to investigate ocean-based solutions to the nation's energy challenges.<sup>64</sup> The aim for the group is to “bridge the gap between concept and commercial deployment of ocean energy technologies by providing at-sea testing facilities and technology development” for marine hydrokinetic energy sources.<sup>65</sup> Their research areas include environmental, resource, economic, education, and technology topics.<sup>66</sup>

The project's initial testing step involves the deployment of two buoy-like structures; one buoy houses an electric turbine generator that has 3 to 7 meter long blades, lowered 5 and 50 meters under the surface of the water.<sup>67</sup> The second buoy is a telemetry buoy that collects and measures data about the ocean currents moving in the area.<sup>68</sup> While the finished project will collect the electric energy produced from the turbines at a facility on the shore, the initial testing buoys will send their electricity to a nearby ship through cables.<sup>69</sup>

The major regulatory agencies involved in this and future projects include: the Department of the Interior through the Bureau of Ocean Energy Management (BOEM); Federal Energy Regulatory Commission (FERC); and the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS).<sup>70</sup> The laws that will primarily affect the SNMREC project, and future wave energy projects, include, but are not limited to, the Outer Continental Shelf Lands Act (OCSLA), National Environmental Policy Act (NEPA), and the Federal Power Act (FPA).<sup>71</sup> The SNMREC project has cleared the first regulatory step, the environmental assessment through BOEM and deployed the first testing buoys from November 2011 to April 2012.<sup>72</sup>

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the conditions of the state of Florida when the state was readmitted to the Union after the Civil War.

63. Fla. Energy Systems Consortium, *supra* n. 34, at 276.

64. *Id.* at 272.

65. *Id.*

66. *Id.*

67. Fla. A. U., *supra* n. 61, at 9

68. *Id.*

69. *Id.* at 9–10.

70. Florida Energy Systems Consortium, *supra* n. 34, at 276.

71. *Id.*

72. Fla. A. U., *Southeast National Marine Renewable Energy Center*, <http://snmrec.fau.edu/news/2011-12-adcp-data-now-available> (accessed Nov. 5, 2012).

### B. FERC and BOEM's Sphere of Regulation

Two federal regulatory agencies implement laws affecting marine hydrokinetic energy projects like FAU's: FERC and BOEM. Both agencies claim regulatory authority under the Outer Continental Shelf,<sup>73</sup> but in 2009 they entered into a Memorandum of Understanding to attempt to co-regulate marine hydrokinetic energy projects.<sup>74</sup> Now, a tenuous and complicated bifurcation of regulatory authority exists where, generally, FERC issues licenses and BOEM issues leases.<sup>75</sup> This section describes the complex division of authority that has emerged.

#### 1. Federal Energy Regulatory Commission (FERC)

The United States Congress has explicitly reserved the regulation of offshore energy production to the federal government.<sup>76</sup> FERC has overseen hydropower in the United States for decades.<sup>77</sup> Expanding on this general authority over inland hydropower, since 2002, FERC has asserted its jurisdiction over offshore hydrokinetic energy projects.<sup>78</sup> As identified by the Outer Continental Shelf Land Act, a "person"<sup>79</sup> who wishes to run a marine hydrokinetic energy project must apply to FERC for a lease and license to operate its project.<sup>80</sup> Thus, any marine hydrokinetic energy projects off the coasts of U.S. territories will be

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73. Rachael E. Salcido, *Rough Seas Ahead: Confronting Challenges to Jump-start Wave Energy*, 39 *Envtl. L.* 1073, 1079 (2009) [hereinafter Salcido, *Rough Seas Ahead*].

74. *Id.*

75. Bureau of Ocean Energy Mgmt. & Fed. Energy Reg. Commn., *Guidelines on Regulation of Marine and Hydrokinetic Energy Projects on the OCS 6* (2d version July 19, 2012) (available at <http://www.ferc.gov/industries/hydropower/gen-info/licensing/hydrokinetics/pdf/mms080309.pdf>).

76. 43 U.S.C. § 1311(d).

77. Rachael Salcido, *Siting Offshore Hydrokinetic Energy Projects: A Comparative Look at Wave Energy Regulation in the Pacific Northwest*, 5 *Golden Gate U. Env'tl. L.J.* 109, 125 (2011) [hereinafter Salcido, *Siting Offshore Hydrokinetic Energy Projects*].

78. *Id.*

79. The Outer Continental Shelf Lands Act defines the term "person" to include, "in addition to a natural person, an association, a State, a political subdivision of a State, or a private, public, or municipal corporation." 43 U.S.C. § 1331(d)

80. Bureau of Ocean Energy Mgmt. & Fed. Energy Reg. Commn., *supra* n. 75, at 3.

nearly exclusively regulated by FERC, as the Submerged Lands Act limits BOEM's regulation to waters off *states* shores only.<sup>81</sup>

Despite this jurisdiction, FERC's regulatory power does have some important exceptions. Projects that involve experimental technology, which will run for a short period of time for educational, or data collection purposes, and from which the power generated will not interfere with an interstate electric grid, thus not constituting a project that "develops electric power" under the FPA — do *not* need a permit from FERC.<sup>82</sup> This is a particularly important exception because wave energy is very new and experimental in the United States; most of the future wave energy projects will be small scale test projects that fit this loophole. But, once marine hydrokinetic energy becomes a more viable source, every non-federal agency run project will need a permit from FERC, even projects in state waters.<sup>83</sup>

Another important exception to FERC's regulatory authority comes from entering into Memoranda of Understanding ("MOUs") with various states. Four states, Oregon<sup>84</sup>, Washington<sup>85</sup>, Maine<sup>86</sup> and California<sup>87</sup>, currently have MOUs with FERC that pertain directly to regulating marine hydrokinetic energy projects in state waters. These MOUs coordinate the

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81. *Id.*

82. *Verdant Power LLC*, 111 F.E.R.C. 61024, 2005 WL 853854 (April 14, 2005), *order on reh'g*, 112 F.E.R.C. P 61143, 2005 WL 1774094 (July 27, 2005). (FERC Commission holding Verdant Power LLC did not need a FERC license for their tidal energy project. Normally hydropower projects that produce a net gain of energy into the "national energy grid need to first obtain a FERC license. However, even though Verdant Power LLC would be plugging its experimental tidal energy project into the power grid, the project would not need a FERC license because the project would be producing "no net impact on the grid.")

83. Bureau of Ocean Energy Mgmt. & Fed. Energy Reg. Commn., *supra* n. 75, at 7.

84. Memo. of Understanding between the Federal Energy Reg. Commn. & the State of Or. (Mar. 26, 2008) (available at <http://ferc.gov/legal/maj-ord-reg/mou/mou-or-final.pdf>).

85. Memo. of Understanding between the Federal Energy Reg. Commn. & the State of Wa. (Jun. 4, 2009) (available at <http://ferc.gov/legal/maj-ord-reg/mou/mou-wa.pdf>).

86. Memo. of Understanding between the Federal Energy Reg. Commn. & the State of Me. (Aug. 19, 2009) (available at <http://ferc.gov/legal/maj-ord-reg/mou/mou-ma.pdf>).

87. Memo. of Understanding between the Federal Energy Reg. Commn. & the State of Cal. (May 18, 2010) (available at <http://ferc.gov/legal/maj-ord-reg/mou/mou-ca.pdf>).

regulatory actions between the respective state and FERC, which significantly helps to streamline, clarify, and speed up the proposed wave energy project.<sup>88</sup> However, MOUs between FERC and states have come under scrutiny in the context of inland hydropower.<sup>89</sup> In regards to marine hydrokinetic energy, stakeholders in the hydropower industry and other federal agencies worried that FERC could be “selling out” federal authority to the states.<sup>90</sup> Of course, parties may challenge MOUs between the states and FERC involving marine hydrokinetic energy if they believe the delegation of federal authority to states exceeds what Congress envisioned in the FPA.<sup>91</sup> As evidenced by the agreements between FERC and Oregon, Maine, Washington, and California, MOUs are an integral exception to FERC’s regulatory authority.<sup>92</sup> This growing trend of MOUs led one commentator to say that these MOUs are the best available answer for the federalism problems that arise when FERC attempts to regulate wave energy production in state waters.<sup>93</sup>

## 2. Bureau of Ocean Energy Management (BOEM)

BOEM is a largely non-controversial player for experimental marine hydrokinetic energy projects, and will most likely be the first stop for all prospective applicants in Florida and across the United States. BOEM, a division of the Department of Interior, has recently claimed regulatory power over siting ocean energy projects pursuant to the Energy Policy Act<sup>94</sup> (“EPAAct”).<sup>95</sup> The EPAAct has specific language that requires the Secretary of the Interior to regulate any actions on the outer

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88. Salcido, *Siting Offshore Hydrokinetic Energy Projects*, *supra* n. 77, at 152.

89. George William Sherk, *Approaching a Gordian Knot: The Ongoing State/federal Conflict Over Hydropower*, 31 Land & Water L. Rev. 349, 384 (1996).

90. *Id.*

91. *Id.*

92. *Supra*, nn. 85 – 88.

93. Mark Sherman, *Wave New World: Promoting Ocean Wave Energy Development Through Federal-State Coordination and Streamlined Licensing*, 39 *Envtl. L.* 1161, 1211 (2009).

94. The Energy Policy Act of 2005 was passed to make many changes to the energy production policy of the United States. Most importantly for this paper’s topic, the 2005 version of the EPAAct was the first version to explicitly recognize and mention wave and tidal energy. The EPAAct of 2005 is codified at 42 U.S.C. §§ 15801-16524 (2005).

95. Salcido, *Rough Seas Ahead*, *supra* n. 73 at 1079–80.

continental shelf that “produce or support production, transportation, or transmission of energy from sources other than oil and gas.”<sup>96</sup> Recently, BOEM has also added the requirement that marine hydrokinetic energy projects that have temporary or permanent attachments to the seabed in the outer continental shelf will also need a BOEM lease.<sup>97</sup> Furthermore, while BOEM operated under the name Minerals Management Service, it regulated offshore oil and gas drilling projects; thus, this agency’s experience regulating offshore energy production will be important and helpful in its new role as the permitter of wave energy test projects.<sup>98</sup>

BOEM issues three major types of permits that relate to marine hydrokinetic energy projects: commercial leases, limited leases, and research leases.<sup>99</sup> Commercial leasing is for large-scale projects that intend to produce consumable electricity and requires cooperation with FERC.<sup>100</sup> However, research and limited leases are entirely within the sphere of BOEM’s control.<sup>101</sup> Both limited and research leases first must be evaluated for competitive interests.<sup>102</sup> If there is a competitive interest in the requested area, BOEM will hold an auction for the rights to the lease;<sup>103</sup> if there is no competitive interest, BOEM will grant so long as the project meets requirements and an acquisition fee is paid.<sup>104</sup> BOEM uses a case-by-case evaluation for limited leases, and generally requires the marine hydrokinetic energy project to be limited to a time span of 5 years or less and generation of less than five megawatts of energy.<sup>105</sup> Case-by-case evaluation is used for research leases, too.<sup>106</sup> Additionally, research leases require the applicant to be: (1) a federal agency or a state

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96. Leases, Easements, and Right-of-way on the Outer Continental Shelf, 43 U.S.C. § 1337(P)(1)(c).

97. Bureau of Ocean Energy Mgmt. & Fed. Energy Reg. Commn., *supra* n. 75, at 6.

98. Salcido, *Rough Seas Ahead*, *supra* n. 73 at 1079–80.

99. Bureau of Ocean Energy Mgmt. & Fed. Energy Reg. Commn., *supra* n. 75, at 7–8.

100. *Id.* at 9.

101. *Id.*

102. Renewable Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf, 30 C.F.R. § 585.201 (2011).

103. *Id.* at § 585.211.

104. *Id.* at § 585.230.

105. Bureau of Ocean Energy Mgmt. & Fed. Energy Reg. Commn., *supra* n. 75, at 8.

106. *Id.*

interested in starting a renewable energy research project (2) to support the future production, transportation, or transmission of renewable energy (3) after a determination of “no competitive interest”.<sup>107</sup> It is important to note that leases are not only obtained by petitioning BOEM, BOEM may also solicit parties to apply for a marine hydrokinetic energy lease by sending out a notice regarding a specific area of interest in the *Federal Register*.<sup>108</sup> BOEM’s renewable energy regulations provide flexibility as to potential research lease terms; many lease terms and conditions are negotiated on a case-by-case basis between the Director of BOEM and the Governor of the requesting state or the head of the federal agency, or its designated representative.<sup>109</sup>

### 3. FERC and BOEM Cooperation

If the marine hydrokinetic energy project is commercial in nature, or if a project manager wants to convert a research lease to a commercial lease, then both a BOEM lease and FERC license are needed.<sup>110</sup> When addressing a license application, FERC and BOEM will make every effort to combine regulatory oversight and streamline this process pursuant to their MOU.<sup>111</sup> Still, there remain necessarily separate actions like the initial contact from prospective project manager to the regulators, and straddling projects.<sup>112</sup> BOEM must always be the first application, as its determination of whether the lease is competitive or non-competitive is required before the licensing process with FERC can start.<sup>113</sup> Once a lease is obtained, transmission line easements will be licensed by FERC, and then added to the lease by BOEM.<sup>114</sup> In sum, license and lease processes are expected to take one and a half to two and a half years.<sup>115</sup> Despite the promise of streamlining contained in the BOEM/FERC MOU, the many details of a specific wave energy project that need to be checked off by

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107. 30 C.F.R. § 585.238.

108. Bureau of Ocean Energy Mgmt. & Fed. Energy Reg. Commn., *supra* n. 75, at 9.

109. *Id.* at 4.

110. *Id.* at 7

111. *Id.*

112. *Id. Infra* n. 117.

113. *Id.* at 8.

114. *Id.*

115. *Id.*

two major federal agencies have left commentators skeptical of how efficient the permitting process will be when applied in practice.<sup>116</sup>

When a marine hydrokinetic energy project straddles the boundary line between state and federal waters, then both a BOEM lease and a FERC license are needed.<sup>117</sup> FERC licensing applies to wave energy projects in both state and federal waters, while a BOEM lease is only needed for the wave energy projects solely in federal waters.<sup>118</sup> Even if the FERC license for the state water portion of the marine hydrokinetic is obtained first, no priority will be given to the BOEM lease application once the project intends to enter into Outer Continental Shelf lands.<sup>119</sup> The earlier the wave energy project manager knows his or her project will be in both state waters and federal waters, the more streamlined this process will be; thus, it is imperative for project managers to know how close to the jurisdictional line their project will be.<sup>120</sup>

*C. Additional Federal Regulation as Illustrated through the FAU Project*

FERC and BOEM are the two main players in the federal regulation of wave energy projects, but many other considerations and authorities also affect a potential marine hydrokinetic energy project. FAU's NEPA Environmental Impact Statement illustrates which additional regulations might apply and how they might function in the hydrokinetic energy project permitting process.<sup>121</sup>

A NEPA analysis requires a "proposed action and alternatives plan" that details the anticipated contours of the development of marine hydrokinetic project plans, and contingency plans if trouble arises with the preferred plan.<sup>122</sup> While NEPA has no substantive mandates, the act requires developers to produce environmental planning documentation is an opportunity for stakeholder involvement and scrutiny of the impact on

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116. Sherman, *supra* n. 93, at 1208.

117. *Id.* at 14.

118. *Id.*

119. *Id.*

120. *Id.*

121. U.S. Dept. of the Int. Bureau of Ocean Energy Mgmt., *supra* n. 6, at 3, 26-28.

122. *Id.* at 4; NEPA 42 U.S.C. § 4332(c) (1970)

the environment of a given project as well as the feasibility of other alternatives.<sup>123</sup>

The developer also consulted four other major sources of regulatory law during this NEPA analysis. First, FAU, and thus likely future marine hydrokinetic energy projects, had to determine whether National Historic Preservation Act (NHPA) lands and structures would be affected.<sup>124</sup> The NHPA aims to have “historical and cultural foundations of the Nation ... preserved as a living part of our community life and development in order to give a sense of orientation to the American people.”<sup>125</sup> No such buildings will be affected by the FAU project; and it would be rare to find an offshore NHPA area., unless it was an historic structure like a shipwreck site.<sup>126</sup>

Second, the FAU project developer had to conduct an the Endangered Species Act (ESA), consultation, which requires the project manager to collaborate with the Fish and Wildlife Service (FWS) and NOAA’s National Marine Fisheries Service (NMFS) to assess the threat to listed species.<sup>127</sup> The FWS provides consultation to the developer about any potential impact, and mitigation of the potential impact, to listed threatened or endangered species, as defined under the Endangered Species Act.<sup>128</sup> NMFS provides consultation to the developer about any potential impact to endangered or threatened species, as well, but with a focus on fisheries and fish habitats.<sup>129</sup> NMFS will also provide the developer with consultation regarding a statute closely related to the Endangered Species Act; the Marine Mammal Protection Act of 1972, which aims to sustain marine mammal populations.<sup>130</sup> The FAU project poses little threat to corals and sea turtles, and no foreseeable threat to

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123. *Id.* .

124. 16 U.S.C. § 470f (1976).

125. *Id.* at § 470(b)(2).

126. U.S. Dept. of the Int. Bureau of Ocean Energy Mgmt., *supra* n. 6, at 26; 16 U.S.C. § 470f (1976)

127. Endangered Species Act, 16 U.S.C. §1536 (1988).

128. Fla. A. U., *supra* n. 61 at 22; 16 U.S.C. §§ 1532(6), 1532(20).

129. *Id.*

130. Fla. A. U., *supra* n. 61 at 22; Marine Mammal Protection Act, 16 U.S.C. § 1361.

mammals, fish, or birds.<sup>131</sup> There is also a Florida component to the ESA, discussed in part IV.

Third, the developers checked the projects compliance with the Magnuson-Stevens Fishery Conservation and Management Act.<sup>132</sup> The Magnuson-Stevens Act is the primary law for managing marine fisheries in federal waters.<sup>133</sup> NMFS ensures that developers do not disturb “essential fish habitats”, as defined by the Magnuson-Stevens Act, “in order to facilitate long-term protection of these habitats and to realize the full potential of the Nation’s fishery resources.”<sup>134</sup> FAU’s consultation with NMFS concluded that essential fishery habitats of snapper, grouper, golden crab, and shrimp would be negatively impacted by the buoy mooring system, but the effects would only be minor and temporary.<sup>135</sup>

Finally, the NEPA analysis addressed the Coastal Zone and Marine Act, but this regulation has been delegated solely to Florida, as it has with all 50 states, and will be discussed in part IV.<sup>136</sup> When a manager of a proposed marine hydrokinetic energy project sites his or her structures in federal waters, compliance with these major environmental laws would likely need to be assessed.

#### IV. STATE OF FLORIDA REGULATIONS

In contrast to the complicated and multi-layered federal regulatory scheme over marine hydrokinetic energy, Florida has no regulations for this type of energy production specifically. This is because no marine hydrokinetic energy projects exist, or have been proposed to be located entirely in state territorial waters. However, Florida has regulations that generally apply to activity in coastal areas. The state also has authority to regulate marine and land-based species, which will impact any future wave energy projects in Florida waters.

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131. U.S. Dept. of the Int. Bureau of Ocean Energy Mgmt., *supra* n. 6, at 27.

132. Magnuson Stevnson Act 16 U.S.C. §§ 1801–1891 (2006).

133. Eric Schwaab, *The Magnuson Act Thirty-five Years Later*, 17 Roger Williams U. L. Rev. 14, 15 (2012).

134. Fla. A. U., *supra* n. 61, at 22; 16 U.S.C. §§ 1801—1802 (2007).

135. U.S. Dept. of the Int. Bureau of Ocean Energy Mgmt., *supra* n. 6, at 28.

136. *Id.* at 3; Coastal Zone Mgmt. Act, 16 U.S.C. § 1451 (2012).

*A. Regulation by Coastal and Aquatic Management Areas (CAMA) and Florida Fish and Wildlife Commission (FWC)*

Some coastal lands in Florida are protected by the Department of Environmental Protection's division of Coastal and Aquatic Management Areas' authority, and these areas are *per se* unavailable for developments like marine hydrokinetic energy projects.<sup>137</sup> The statutory language of the aquatic preserves' protections is strong, stating that lands selected for designation as an aquatic preserve shall be set aside *forever* as sanctuaries for the benefit of future generations.<sup>138</sup> An aquatic preserve can be designated either as a biological preserve for preservation of unique plant and animal life, a scenic preserve for maintenance of scenic qualities, or a biological preserve to keep certain scientific values or qualities.<sup>139</sup> The Board of Trustees of the Internal Improvement fund are required to enact and enforce rules that limit activities within the preserves to traditional and lawful uses of the land, like fishing and recreation.<sup>140</sup> Despite the lawfulness of marine hydrokinetic energy projects, it would be impossible to argue that this new technology is a traditional use. There are limitations to aquatic preserve designation, however, as only state-owned submerged lands can be granted this statutory protection.<sup>141</sup> This leaves a large portion of the state waters off Florida's coast available for wave energy projects- including much of the land beyond the three nautical miles off the coast.

Along with aquatic preserve protections of certain Florida coastlines, the Florida Fish and Wildlife Commission (FWC), with concurrent power in regulation from the Department of Environmental Protection, has statutory authority to ban prospective marine hydrokinetic energy projects from areas where threatened or protected species live.<sup>142</sup> An "Endangered Species" is defined by Florida law as "any species of fish and wildlife naturally occurring in Florida whose prospects of survival are

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137. Aquatic Preserves, Fla. Stat. § 258.36 West 2012).

138. *Id.*

139. *Id.* at § 258.37(2) (biological), 258.37(3) (aesthetic), 258.37(4) (scientific).

140. *Id.* at § 258.43.

141. *Id.* at § 258.40.

142. Endangered and Threatened Species Act, Fla. Stat. § 379.2291 (2011); *Caribbean Conservation Corp., Inc. v. Florida Fish & Wildlife Conservation Comm'n.*, 838 So. 2d 492, 504 (Fla. 2003)

in jeopardy due to *modification or loss of habitat*; ... inadequacy of regulatory mechanisms; or other natural or manmade factors affecting its continued existence[.]”<sup>143</sup> The FWC promulgates rules to protect endangered and threatened species, including protecting their habitat.<sup>144</sup> Florida has a large number of endangered and threatened species in coastal areas, including sea turtles, 14 species of fish, 3 species of coral, and many dozens of other animals.<sup>145</sup> If any one of these species is present in a coastal area in which a marine hydrokinetic energy project plans to have transmission lines, or boat activity; then the FWC would be mandated to ensure the species and its habitat is not harmed, or the project will be denied.

### B. Coastal Management Plans

Florida’s coastal management plans are far more permissive where potential marine hydrokinetic energy projects are concerned. The Federal Coastal Zone Management Act (CZMA), requires Florida (and every other coastal state) to describe, the coastal land or water uses and natural resources that have a direct and significant impact on the coastal waters; and new energy facility planning.<sup>146</sup> Each state that adopts a coastal management plan must ensure that its coastal zone development is consistent with the plan and the state must also use its authority over submerged state lands in the interest of the public.<sup>147</sup> This acronym may have been used before, but I’m not sure it was defined. NOAA requires coastal management programs include policies and planning processes that map out coastal siting of energy facilities, in order for states to implement a marine hydrokinetic energy project while still being able to reserve the coastal area for multiple uses..<sup>148</sup>

As part of Florida’s coastal management plan (FCMP), the Department of Environmental Protection reserves the right to make final

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143. *Id.* at §379.2291(3)(b)(1) (emphasis added).

144. Marine Fisheries, Fla. Stat. §379.2401 (YEAR).

145. Fla. Fish & Wildlife Conser. Commn., *Florida’s Endangered and Threatened Species* 5 (Jan. 2013) (available at [http://myfwc.com/media/1515251/threatened\\_endangered\\_species.pdf](http://myfwc.com/media/1515251/threatened_endangered_species.pdf)).

146. Coastal Zone Management Act of 1972, 16 U.S.C. § 1455 (1972).

147. Laura Koch, *The Promise of Wave Energy*, 2 Golden Gate U. Env’tl. L.J. 162, 195–96 (2008).

148. *Id.*

consistency decisions on federal actions within state waters to ensure that all activities having reasonably foreseeable coastal effects are consistent with the enforceable policies of the federally-approved FCMP.<sup>149</sup> One of the federal actions expressly mentioned in FCMP to be a reviewable activity is outer continental shelf activity, including leasing decisions by BOEM, and any actions under the Federal Power Act.<sup>150</sup> In the context of a proposed wave power project, Florida will review federal actions on a proposed BOEM lease for consistency while evaluating the wave energy project's state environmental resource permit.<sup>151</sup> FERC licensing, on the other hand, does not have an analogous state regulation, so the Florida State Clearinghouse, a division of the Department of Environmental Protection meant to ensure consistency between federal and state actions, will conduct the final consistency decisions with regards to FERC activities.<sup>152</sup>

Even though there is not a marine hydrokinetic energy project operating in Florida waters yet, it is likely that all three of these Florida regulatory schemes would apply.. For efficiency's sake, it would be best for the Department of Environmental Protection and the Fish and Wildlife Commission to work together if and when a wave energy project comes to Florida waters. Otherwise, the already complicated federal permitting and leasing schemes may have a rival for headache inducing regulatory roadblocks.

#### V. IMPROVEMENTS TO ENCOURAGE MARINE HYDROKINETIC ENERGY DEVELOPMENT

In 2009, Florida's energy consumption was 63 percent oil and gas products and only 6 percent renewable energy, none of which was marine hydrokinetic energy.<sup>153</sup> Additionally, 84 percent of Florida's energy generation the year prior was from oil and gas, while only 2 percent was from renewable sources.<sup>154</sup> The Florida Department of Agriculture and

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149. Fla. Dept. of Env'tl. Prot., *Florida Coastal Management Program Guide*, 14 (updated Feb. 2012) (available at [http://www.dep.state.fl.us/cmp/publications/fcmp\\_guide\\_Feb\\_2012.pdf](http://www.dep.state.fl.us/cmp/publications/fcmp_guide_Feb_2012.pdf)).

150. *Id.* at 15.

151. *Id.* at 17.

152. *Id.*

153. Fla. Dept. of Agric. & Consumer Serv., *supra* n. 4, at 7.

154. *Id.* at 8.

Consumer Service's (DACS) Division of Energy states in its 2011 annual report that the most significant potential for growth in Florida's renewable energy sector is ocean current and ocean thermal energy conversion.<sup>155</sup> The report estimates that up to 4 to 10 gigawatts could be produced by marine hydrokinetic energy in Florida alone.<sup>156</sup> The same report then details that the principle barrier to developing this "significant potential" is permitting.<sup>157</sup>

In contrast, solar power has significantly expanded in recent years in Florida.<sup>158</sup> The Florida Legislature has even set out the following goals as statutory mandates: (1) Establish goals and strategies for increasing the use of solar energy in this state; (2) Aid and promote the commercialization of solar energy technology; (3) Identify barriers to greater use of solar energy systems in this state, and developing specific recommendations for overcoming identified barriers, with findings and recommendations to be submitted annually in the report to the Governor and Legislature.<sup>159</sup> Further, in 2006 the Florida Legislature passed Senate Bill 888, creating a solar rebate plan that encouraged Florida citizens to invest in solar energy panels to power their home.<sup>160</sup> After starting this solar rebate plan with 2.5 million dollars of funding, the Florida legislature increased the money granted to the plan each year from 2007 to 2009 by a total of 22.9 million dollars.<sup>161</sup> Yet, even with the success of this solar energy program, *no* future renewable energy grants are proposed by the Florida DACS Division of Energy.<sup>162</sup> This seems to indicate that the Florida is taking a step backwards in its attitudes towards renewable energy.

While investing in carbon-neutral, renewable solar energy is certainly good for climate change, in that solar is also a carbon-neutral renewable energy source, Florida needs to also encourage wave energy. Estimates suggest that if all types of marine hydrokinetic energy were added to the grid, this resource could account for ten percent of U.S.

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155. *Id.* at 13.

156. *Id.* at 16.

157. *Id.* at 13.

158. *Id.*

159. *Additional Functions of the Department of Agriculture and Consumer Services*, Fla. Stat. § 377.703(h)(1)–(3).

160. Fla. Dept. of Agric. & Consumer Serv., *supra* n. 4, at 24.

161. *Id.* at 24–25.

162. *Id.* at 27–29.

energy demands.<sup>163</sup> In fact, on the outer continental shelf of Florida's Atlantic Coast, the total wave energy resource available is estimated at 41 Terawatts<sup>164</sup> a year.<sup>165</sup> This lower estimate is still significant for the estimated wave energy resources on the outer continental shelf of Florida's Gulf Coast, with an estimate 23 Terawatts a year of energy available.<sup>166</sup>

With both solar and wave energy available in Florida and both resources reducing dependence on harmful fossil fuels, there is no reason to hold wave power to a lower standard.<sup>167</sup> Even on the crowded coastlines of Florida where many tenants are fighting for real estate, wave energy gives the unique benefit of both reducing carbon emissions while increasing energy supplies.<sup>168</sup> This means one wave energy project will not only produce global benefits in the form of reduced greenhouse gasses in the atmosphere, but also local benefits of offsetting energy needs of crowded coastal areas.<sup>169</sup> Unless unforeseen environmental harms begin to emerge in connection with wave energy projects, it is likely the popularity of offshore renewable energy will continue to grow.<sup>170</sup> As one commentator remarks, "Siting decisions should therefore be the result of an ongoing, active process grounded in available data--a process in which the participation of the scientific and ocean conservation communities, as well as local stakeholders, is vitally needed. Coastal states must be proactive about using their resources and authority to protect the public interest in sustainable wave energy development."<sup>171</sup>

One of the simplest means to encourage wave energy development in the United States is to make the permitting scheme significantly shorter and easier. The most drastic action available to

163. Salcido, *Rough Seas Ahead*, *supra* n. 73, at 1078.

164. A Terawatt is one unit of measurement for energy production to the 12th power. One Terawatt is equal to one trillion watts

165. Electric Power Research Inst., *Mapping and Assessment of the United States Ocean Wave Energy Resources: 2011 Technical Report* 4-3 (Dec. 1, 2011) (available at <http://www.epri.com/abstracts/pages/productabstract.aspx?ProductID=00000000001024637>).

166. *Id.* at 4-4.

167. Salcido, *Rough Seas Ahead*, *supra* n. 73, at 1105.

168. *Id.* at 1108.

169. Koch, *supra* n. 147, at 189.

170. *Id.* at 195.

171. *Id.* at 199.

achieve this goal is to eliminate FERC from the regulating realm of marine hydrokinetic energy production, in order to have unified authority in BOEM.<sup>172</sup> FERC has been criticized for not tailoring its licensing regime to the needs of wave power projects.<sup>173</sup> Instead FERC has opted to apply the same licensing scheme to wave energy as it does to inland hydropower projects; an approach that treats two energy producing technologies the same, even though they differ “in significant ways.”<sup>174</sup> In contrast BOEM already allocates leases and marine spatial planning for other energy projects on the outer continental shelf, putting it in a much better position to deal with the land-use conflicts that will arise with an emergence of wave energy projects.<sup>175</sup> The logical support for BOEM to be the sole federal regulatory authority even prompted questions from Congress, which asked why FERC should be involved with wave energy projects if BOEM is already the sole authority for wind and other similar renewable energy projects in the outer continental shelf.<sup>176</sup> Unfortunately, FERC was the first agency to act with regards to wave energy it issued a license for a project in the outer continental shelf of the United States well before BOEM promulgated any rules on wave energy.<sup>177</sup> FERC’s quick response and the recent MOU with BOEM all but ensure Congress will not enact legislation to preempt FERC’s claim by solving the potentially problematic overlapping regulatory authorities.<sup>178</sup>

A less dramatic solution than completely severing FERC from regulating marine hydrokinetic energy production is to give the states more power to issue licenses using FERC standards.<sup>179</sup> FERC is already entering into MOUs with states to streamline licensing wave energy projects.<sup>180</sup> These types of agreements should be encouraged for Florida, as an MOU with FERC will “support development by reinforcing the [state and FERC’s] interests in renewable energy development generally,

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172. Sherman, *supra* n. 93, at 1209.

173. Koch, *supra* n. 147, at 188.

174. *Id.*

175. Sherman, *supra* n. 93, at 1209.

176. Sen. Comm. on Energy & Natural Resources, *Alternate Energy-related Uses on the Outer Continental Shelf*, 110th Cong. 1 (June 7, 2007) (statement of Sen. Jeff Bingaman, Chairman).

177. Koch, *supra* n. 147, at 189.

178. Sherman, *supra* n. 93, at 1211.

179. Koch, *supra* n. 147, at 190.

180. See *supra* nn. 84–87.

the shared goal of encouraging pilot and demonstration projects for wave and hydrokinetic energy development, and a desire to clarify, streamline, and coordinate the regulatory approval process applicable in state waters.”<sup>181</sup> Florida needs to take this proactive approach to wave energy production in its waters by developing a comprehensive plan with FERC regarding licensing, instead of evaluating licensing project-by-project through FERC consultations after-the-fact.<sup>182</sup> Other federal statutes encourage this federalism approach, like the Coastal Zone Management Act, which provides incentives for states to manage their coastal environment.<sup>183</sup> Additionally, the CZMA could be used as a blueprint on how FERC’s licensing should strive to be consistent with state laws and planning in the state’s territorial waters.<sup>184</sup> States are better equipped than cumbersome federal authorities like FERC to manage the permitting process because. States recognize the value of streamlined permitting more than cumbersome federal authorities, and many states develop specialized and unique means to minimize inefficiencies.<sup>185</sup>

## VI. CONCLUSION

A smattering of experimental wave energy projects surrounding America’s coastline is a promising sign for domestic energy policy. Every region of the United States seems to be embracing wave energy as an integral source of energy generation; from Florida, to New Jersey, to Hawaii.<sup>186</sup> Renewable energy and carbon neutral energy production must continue to be goals that political, scientific, and cultural leaders push to achieve. Additionally, BOEM and FERC coming together to streamline their regulations and cooperate with states shows a willingness in federal government to encourage wave energy through promoting permitting efficiency. Of course, many flaws still remain with the regulatory scheme for offshore wave energy production, but a shift of public opinion from

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181. Salcido, *Siting Offshore Hydrokinetic Energy Projects*, *supra* n. 77, at 152.

182. Koch, *supra* n. 147, at 197.

183. 16 U.S.C. § 1455.

184. Salcido, *supra* n. 73, at 1100.

185. Sherman, *supra* n. 93, at 1217.

186. Electric Power Research Institute Final Report, *Mapping and Assessment of the United States Ocean Wave Energy Resource*, ix (Dec 2011)(available at <http://www1.eere.energy.gov/water/pdfs/mappingandassessment.pdf>).

favoring the cheapest energy production to favoring the most beneficial energy production for the public will help emphasize the need for further clarity in permitting and cooperative governance of resources. In fact, a recent public poll even shows a strong majority of Americans believe that reducing the dependency on foreign is more important than low gas prices.<sup>187</sup> Soon, the oceans around the United States can be an unyielding source of clean energy, rather than an unyielding reminder of climate change and the impending destruction it will bring with it.

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187. Rasmussen Pub. Polling, *63% Believe Reducing Dependence on Foreign Oil More Important than Low Gas Prices*, [http://www.rasmussenreports.com/public\\_content/business/gas\\_oil/february\\_2012/63\\_believe\\_reducing\\_dependence\\_on\\_foreign\\_oil\\_more\\_important\\_than\\_low\\_gas\\_prices](http://www.rasmussenreports.com/public_content/business/gas_oil/february_2012/63_believe_reducing_dependence_on_foreign_oil_more_important_than_low_gas_prices) (Feb. 27, 2012).