Streamlining the Hydropower Licensing Process: What's Up with the Dam Licensing?

"A river is more than an amenity, it is a treasure. It offers a necessity of life that must be rationed among those who have power over it."[1]

I. INTRODUCTION

On April 14, 2017, Energy Secretary Rick Perry requested that the Department of Energy (DOE) conduct a study to examine electricity markets and reliability.[2] Four months later, the DOE released a 181-page report evaluating the present trajectory of the U.S. electricity system and providing policy recommendations to promote grid resiliency.[3] Among other things, the report recommended encouraging the Federal Energy Regulatory Commission (FERC) to revisit the hydropower licensing process in order to minimize regulatory burden.[4]

The paramount reason that the United States is not further developing hydropower is the burdensome licensing process.[5] To remedy the inefficient licensing

1. New Jersey v. New York, 283 U.S. 336, 342 (1931).

2. *See* U.S. DEP'T. OF ENERGY, STAFF REPORT TO THE SECRETARY ON ELECTRICITY MARKETS AND RELIABILITY 1 (2017), https://www.energy.gov/sites/prod/files/2017/08/f36/Staff%20Report%20on%20Electricity%20Markets%20and%20Reliability_0.pdf [https://perma.cc/AJ9Y-REQY] (explaining why Secretary Perry requested study). The Secretary directed the DOE to focus on how the changing nature of electricity generating processes challenges the original policy assumptions that shaped the creation of the wholesale electricity market. *See id.* The Secretary also requested that the DOE examine wholesale energy capacity markets' effect on grid reliability, and the extent to which regulatory burdens, as well as other policies, are responsible for the "premature retirement of baseload power plants." *See id*. Baseload power plants produce energy at sustained levels throughout the day and therefore protect against power grid disruptions. *See id.* at 5.

3. *See id*. at 1-2; *see also* Stinson Leonard Street, *DOE Issues Lon-Awaited Staff Report on Electricity Markets and Reliability*, BREAKING ENERGY (Aug. 29, 2017), http://breakingenergy.com/2017/08/29/doe-issues-lon-awaited-staff-report-on-electricity-markets-and-reliability/ [https://perma.cc/78BH-NJ2S] (summarizing DOE's recommendations). Infrastructure resilience is defined as the ability to anticipate, adapt to, and recover from disruptive events. *See* U.S. DEP'T. OF ENERGY, *supra* note 2, at 63 (discussing grid resilience).

4. *See* U.S. DEP'T. OF ENERGY, *supra* note 2, at 127 (explaining recommendations). The report specifically encourages FERC to reduce the regulatory burden for small hydroelectric projects and pumped storage. *See id.*

5. *See, e.g.*, U.S. DEP'T OF ENERGY, HYDROPOWER VISION: A NEW CHAPTER FOR AMERICA'S 1ST RENEWABLE ELECTRICITY SOURCE 51 (2016), https://energy.gov/sites/prod/files/2016/10/f33/Hydropower-Vision-10262016_0.pdf [https://perma.cc/M3BF-62R4] (stating hydropower can benefit from reduced regulatory uncertainty); Megan Hansen et al., *The Regulatory Noose: Logan City's Adventures in Micro-Hydropower*, ENERGIES, June 2016, at 2-3 (stating complex regulations discourage development and comparing hydropower regulations to other renewable energy regulations); Gina S. Warren, *Small Hydropower, Big Potential: Considerations for Responsible Global Development*, 53 IDAHO L. REV. 149, 173-74 (2017) (explaining regulatory burden hinders development).

process the Obama Administration enacted the Hydropower Regulatory Efficiency Act of 2013 (HREA).[6] Why then, in 2017, did the DOE recommend that FERC revisit the licensing process with the purpose of streamlining it?[7]

Hydroelectric power is a proven, reliable resource that creates electricity without burning fossil fuels and thus does not contribute to global climate change.[8] If hydropower is so efficient, why not utilize it to a greater degree?[9] One possible explanation is that increased awareness of the negative externalities of dams has caused a dam removal movement.[10] However, at the same time, a growing number of activists have been pushing for the use of non-powered dams (NPD), which are small dams that do not currently produce electricity.[11] The answer seems to be that NPDs are subject to the same complex licensing process as large-scale dams.[12]

This Note begins by detailing the rise of large and small hydropower facilities in the United States.[13] The Note then explains the different statutes that influence the hydropower licensing process and summarizes the licensing process itself.[14] This Note then tracks the history of the government's efforts to streamline hydropower licensing, culminating with a discussion of the HREA.[15] After explaining the HREA, this Note analyzes its end result.[16] Finally, this Note offers

6. *See* Hydropower Regulatory Efficiency Act of 2013, Pub. L. No. 113-23, 127 Stat. 493; Emily Rietman, Comment, *Alternative Solutions to Power Oversupply in the Pacific Northwest*, 45 ENVTL. L. 207, 226-27 (2015) (explaining HREA enacted to streamline hydropower licensing).

7. *See infra* Section II.E.2 (discussing results of HREA).

8. *See* Lea Kosnik, *The Potential of Water Power in the Fight Against Global Warming in the U.S.*, 36 ENERGY POL'Y 3252, 3252 (2008) (discussing global climate change, development, and capacity of hydropower resources); *see also* Kevin Young & Linda C. Ciocci, *Electric Generation: Hydropower an Integral Part of Renewables, Has Growth Prospects*, NAT. GAS & ELECTRICITY, Nov. 2014, at 9, 9-10 (describing hydroelectric production benefits).

9. *See infra* Section III.A (discussing effect of overly burdensome regulations).

10. *See* Catherine Cumming, Note, *The Hydropower Regulatory Efficiency Act: Not Giving a Dam for Negative Externalities or Stakeholder Oversight*, 16 MINN. J.L. SCI. & TECH. 917, 923-29 (2015) (discussing opinions concerning societal and environmental externalities of dams); *see also* Jody Freeman, *The Uncomfortable Convergence of Energy and Environmental Law*, 41 HARV. ENVTL. L. REV. 339, 361 (2017) (explaining origins of environmental movements).

11. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 95 (indicating powering NPDs best avenue for adding hydropower capacity on per-dam basis); Dan Tarlock, *Hydro Law and the Future of Hydroelectric Power Generation in the United States*, 65 VAND. L. REV. 1723, 1760-62 (2012) (discussing small hydro viability); Gina S. Warren, *Hydropower: Time for a Small Makeover*, 24 IND. INT'L & COMP. L. REV. 249, 250-54 (2014) (discussing reports detailing viability of small hydropower).

12. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 136-38 (listing major statutes governing hydropower development); Warren, *supra* note 11, at 260-67 (highlighting lengthy hydropower licensing and suggesting improvements); Cumming, *supra* note 10, at 931-32 (asserting overregulation disincentive to hydropower development).

13. *See infra* Sections II.A.1-2 (explaining growth of hydropower in United States).

14. *See infra* Sections II.B.2-3, II.C (explaining licensing and statutes influencing hydropower regulation).

15. *See infra* Sections II.D-E (analyzing efforts to increase hydropower licensing efficiency).

16. *See infra* Section III.A (discussing results and implications of HREA).

three routes Congress can take to begin expediting the small hydropower licensing process.[17]

II. HISTORY

A. Rise of Hydropower in the United States

1. Hydropower Generally

Hydropower is the oldest, most abundant, and most efficient renewable energy source in the United States.[18] Throughout its short history, the United States has built over 80,000 dams.[19] In the late 1800s, a group of business leaders realized that falling or flowing water could turn the turbines of a generator.[20] Following this discovery, the New Deal era emphasized construction and production within the United States and induced a boom in dam construction.[21] Accordingly, the United States constructed a majority of its large hydropower facilities during the New Deal era.[22]

17. *See infra* Section III.B (justifying removal of regulation and exploring new study).

18. *See* Tarlock, *supra* note 11, at 1724 (discussing benefits of hydropower); Warren, *supra* note 11, at 249 (explaining hydropower).

19. *See* Mark James et al., *Undamming the Federal Production Tax Credit: Creating Financial Incentives for Dam Trading and Dam Removal*, 53 IDAHO L. REV. 93, 100-01 (2017) (indicating hydroelectric power generation not dominant motivation in dam building); Cumming, *supra* note 10, at 920 (discussing energy capacity of U.S. dams); *see also* Office of Energy Efficiency & Renewable Energy, *History of Hydropower*, U.S. DEP'T OF ENERGY, https://energy.gov/eere/water/history-hydropower [https://perma.cc/T5HA-FUQW] (graphing rise of United States' use of hydropower). The United States built a majority of dams for purposes other than hydropower, including, but not limited to: irrigation, navigation, supporting municipal water supplies, and flood control. *See* Kosnik, *supra* note 8, at 3256 (identifying existing outlets for hydropower facilities). The purpose and location of the nation's dams vary because of water availability, precipitation schedules, and geography. *See* BOUALEM HADJERIOUA ET AL., OAK RIDGE NAT'L LAB., AN ASSESSMENT OF ENERGY POTENTIAL AT NON-POWERED DAMS IN THE UNITED STATES 6-8 (2012), https://energy.gov/sites/prod/files/2013/12/f5/npd_report_0.pdf [https://perma.cc/MPN8-QSXX] (providing map to view hydrologic regions of United States). The United States first harnessed hydropower to operate mills. *See* Gina S. Warren, *Hydropower: It's A Small World After All*, 91 NEB. L. REV. 925, 929 (2013) (explaining reasons for early American hydropower development). Early Americans settled along rivers to take advantage of the moving water, and dams were seen as a way to become energy independent from England. *See id.*

20. *See* Tarlock, *supra* note 11, at 1728 (discussing scientific advancement leading to modern hydropower). The realization took place after Thomas Edison created the steam-powered electric generator. *See id.*

21. *See* Cumming, *supra* note 10, at 923 (explaining rise of hydropower).

22. *See* James et al., *supra* note 19, at 102 (addressing different periods of dam building); Cumming, *supra* note 10, at 923 (discussing large, complicated dam construction). During this period, hydroelectric production became a fundamental part of a majority of the large publicly-financed dams in the West. *See* Tarlock, *supra* note 11, at 1732-33 (indicating importance of hydroelectric generation to New Deal programs). The facilities created during the New Deal period include the Hoover Dam, Wilson Dam, and Central Valley Project. Cumming, *supra* note 10, at 923. The Niagara Falls dam was the first major hydroelectric dam in the United States. *See The History of Hydropower Development in the United States*, U.S. BUREAU OF RECLAMATION (Feb. 3, 2016), https://www.usbr.gov/power/edu/history.html [https://perma.cc/T8YG-3AUJ] (highlighting rise of hydropower generally). The Niagara Falls dam produced power for the first hydro powered street lights in the United States. *See* Kosnik, *supra* note 8, at 3253.

Hydropower relies on the energy that water creates as it moves through narrow channels and into turbines.[23] The potential energy capacity of moving water varies depending on the volume of water stored or the change in elevation from one point to another.[24] The momentum of the moving water spins a turbine that in turn transfers kinetic energy to a generator.[25] Hydropower generates electricity with an extremely efficient conversion rate of 90%, whereas other renewables average only 50%.[26]

Although most dams use this method to create electricity, dams come in a vast array of sizes and harness moving water in many ways.[27] The three types of hydropower facilities are impoundments, diversions, and pumped storage facilities.[28] An impoundment facility uses a dam to store water in a reservoir and generates electricity by periodically releasing water from the reservoir to spin a turbine that activates a generator.[29] A diversion directs only a portion of a river through a narrow channel and does not always require a dam.[30] A pumped storage facility moves water from one reservoir to another reservoir at a higher elevation to store energy when energy costs are low, and releases that water downhill through turbines to produce cost efficient electricity when energy costs are high.[31]

Despite the existence of more than 80,000 dams, hydroelectric power only accounts for between 6% and 8% of overall energy production in the United States.[32] This is partly because, of the tens of thousands of dams installed over

23. *See* Carlos M. Marquez, II, Note, *Federal Power Act Limitations on FERC Dam Decommissioning Authority: Shielding Preexisting Licensees and Revisiting Trust Funds to Protect the Public Interest*, 27 COLO. NAT. RESOURCES, ENERGY & ENVTL. L. REV. 157, 164 (2016) (explaining electricity production result of water velocity, position, or both). The narrow channel through which water passes is called a penstock. *See id.*

24. *See Hydropower Explained*, U.S. ENERGY INFO. ADMIN. (June 13, 2017), https://www.eia.gov/energyexplained/index.cfm?page=hydropower_home [https://perma.cc/E23C-RKL2] (explaining how moving water creates electricity).

25. *See* Marquez, *supra* note 23, at 164-65 (detailing electrical generation process). The kinetic energy causes the generator's internal wires to spin around magnets and produce electricity. *See id.* at 165.

26. *See* Hansen et al., *supra* note 5, at 2 (comparing power conversion efficiency). The high conversion rate of hydroelectric plants means that once they are built they convert energy into electricity much more efficiently than other renewable energy sources. *See id.*

27. *See* Marquez, *supra* note 23, at 165 (indicating dams built in variety of forms and sizes); Office of Energy Efficiency & Renewable Energy, *Types of Hydropower Plants*, U.S. DEP'T OF ENERGY, https://energy.gov/eere/water/types-hydropower-plants [https://perma.cc/ZFS6-A4NH] (explaining three different types of hydropower facilities).

28. *See* OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, *supra* note 27 (describing hydropower facilities).

29. *See id.* (explaining impoundments most common type of hydroelectric plants). Impounding facilities can generate electricity "either to meet changing . . . needs or to maintain a constant reservoir level." *See id.*

30. *See id.* Diversions are sometimes referred to as run-of-river facilities. *See id.*

31. *See id.*

32. *See* James et al., *supra* note 19, at 100 (identifying amount of registered dams in United States); Warren, *supra* note 11, at 249 (discussing hydropower potential). The 6.3% of U.S. energy produced by hydropower in 2014 amounted to 259,367,000 megawatt-hours of electricity. *See* Marquez, *supra* note 23, at 160. That amount of electricity is enough to power over twenty-three million homes. *See id.*

600,000 miles of rivers, the United States only uses around 2,500, or 3%, to produce electricity.[33] The 2,500 hydroelectric dams account for 48% of overall renewable energy generation.[34]

The average U.S. hydropower plant is sixty-four years old.[35] Over 500 hydroelectric licenses will expire within the next twenty years.[36] If the licenses expire, and the plants no longer function, the United States could lose 6,000 megawatts of non-federal hydropower within the next five years.[37] The United States is now in a position where its dams are in need, or approaching the need, of significant investment.[38]

The 1970s' environmental movement produced laws that began to constrain the operation and use of dams.[39] This was due in part to the policies of the early twentieth century, which shaped hydropower, focusing on economic development and national defense as opposed to environmental impacts.[40] While dam opponents existed during the dam construction boom, it was not until later when public opinion about the utility and environmental impact of dams shifted that

33. *See* Cumming, *supra* note 10, at 920 (indicating low proportion of dams produce electricity). Hydropower represents "only a fraction" of waterway development. *See* HADJERIOUA ET AL., *supra* note 19, at vii.

34. *See* Marquez, *supra* note 23, at 160 (explaining proportion of total energy powered by hydropower).

35. *See* Elizabeth Ingram, *DOE Report on the Electric Grid Provides Valuable Perspectives on Hydropower in U.S.*, HYDROWORLD (Aug. 25, 2017), http://www.hydroworld.com/articles/2017/08/doe-report-on-the-electric-grid-provides-valuable-perspectives-on-hydropower-in-u-s.html [https://perma.cc/VV88-3UKH] (discussing long-term value of hydropower plants). Army Corps of Engineers' dams are over fifty years old on average. *See* James et al., *supra* note 19, at 102. The average age of Bureau of Reclamation dams is almost sixty years. *See id.* Also, many non-federal dams are also reaching the mid-century mark. *See* KELSI BRACMORT ET AL., CONG. RESEARCH. SERV., R42579, HYDROPOWER: FEDERAL AND NONFEDERAL INVESTMENT 14 (2015) (quantifying non-federal dams' fifty-year licenses set to expire in near future).

36. *See* Marquez, *supra* note 23, at 161 (listing consequences of expiring licenses).

37. *See* Cumming, *supra* note 10, at 934 (portraying age of hydropower dams). The amount of hydropower up for relicensing is expected to double over the next ten years. *See id.*

38. *See* James et al., *supra* note 19, at 102 (describing different phases of U.S. dam development). Although many licenses are up for renewal, with routine maintenance the average expected life of a hydropower facility is over 100 years. *See* Ingram, *supra* note 35. The plausibility of operating a hydropower facility for over 100 years is reinforced by the number of facilities eligible to enter the Hydro Hall of Fame annually. *See id.* To be eligible a facility must operate continuously for over 100 years. *Id.*

39. *See* Tarlock, *supra* note 11, at 1735-36 (discussing changing opinion of dams). In the 1970s, President Carter created a "hit list" for large dams he considered environmentally destructive and wasteful. Sam Kalen, *Historical Flow of Hydroelectric Regulation: A Brief History*, 53 IDAHO L. REV. 1, 2 & n.4 (2017) (identifying end of era of constructing large dams). Carter created the list with the intention of removing the dams that he saw as wasteful. *See id.*

40. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 71 (characterizing rise of hydropower laws). As a result of rising awareness of environmental impacts, the government began to pass laws focused on safe and environmentally sound dam operation. *See id.* at 71-72.

dam opponents began to see changes in policy.[41] In general, current public perception of large hydropower dams is negative.[42] General public perception is negative because the potential negative externalities resulting from damming a waterway include the altering of flow regimes, the degradation of water quality, and increased fish mortality.[43] Regardless of public condemnation, large dams are not necessary to create a significant amount of clean, renewable hydropower.[44]

2. Small Hydropower Generally

Although the United States is unlikely to significantly develop large conventional hydropower, small hydropower facilities can satisfy a substantial portion of U.S. energy needs without the negative externalities associated with large dams.[45] All fifty states have small dams without hydropower facilities.[46] Small hydropower can be placed on just about any running water source, but the vast majority of the most plausible and efficient sites are those that involve installing a hydropower facility on an existing NPD.[47]

Intuitively, it makes sense that installing a hydropower facility at an existing NPD would add little additional ecological impact.[48] The installation of a hydropower facility on an existing dam minimally affects the ecosystem because

41. *See* Cumming, *supra* note 10, at 924 (explaining shift in public opinion supported dam removal movement). One side of the public opinion believes hydropower is costly and environmentally damaging. *See* Kalen, *supra* note 39, at 2. The other side believes dams stabilize grid operations and offer reserve generation, peaking power production, and balancing generation. *See id.*

42. *See* JORDAN LOFTHOUSE ET AL., UTAH STATE UNIV., INST. OF POLITICAL ECON., RELIABILITY OF RENEWABLE ENERGY: HYDRO 3 (2015), http://www.usu.edu/ipe/wp-content/uploads/2015/11/Reliability-Hydro-Full-Report.pdf [https://perma.cc/PY6U-YQUV] (discussing large-scale hydropower). The caveat to a movement against building new dams is the fact that most of the attractive large-scale dam sites have already been built, making new growth in large hydropower unlikely. *See id*.

43. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 93-94 (explaining potential negative results of dam construction). Other potential problems are a loss of connectivity in the system, sediment transport issues, land loss, scenic impairment, pollution, and aquatic ecosystem modification. *See id.* at 94; Tarlock, *supra* note 11, at 1736-38 (listing and explaining possible negative externalities of dams). Initial dam construction activities substantially contribute to their environmental impacts. *See* Tasneem Abbasi & S.A. Abbasi, *Small Hydro and the Environmental Implications of its Extensive Utilization*, 15 RENEWABLE & SUSTAINABLE ENERGY REV. 2134, 2139 (2011) (describing negative environmental impacts).

44. *See* Kosnik, *supra* note 8, at 3255 (indicating small hydropower facilities can produce large quantities of power). The negative impacts of hydropower greatly diminish as the hydropower dam gets smaller. *See id.* Hydropower facilities generating less than thirty megawatts produce emissions-free energy without the substantial number of potential negative externalities associated with large hydropower dams. *See id.*

45. *See* Warren, *supra* note 19, at 926 (commenting on potential future of hydropower development).

46. *See* LOFTHOUSE ET AL., *supra* note 42, at 4 (pointing out potential of NPDs in United States). A majority of dams in the United States are small. *See* Cumming, *supra* note 10, at 923 (discussing history of U.S. dams); *see also* James et al., *supra* note 19, at 147 (explaining dam-building phases in United States).

47. *See* Warren, *supra* note 5, at 153, 170 (reinforcing viability of powering NPDs).

48. *See* Bob Petz, *Assessing the Untapped Hydroelectric Potential of Existing Non-Powered Dams*, ECOLOGY (Apr. 29, 2012), http://www.ecology.com/2012/04/29/untapped-hydroelectric-power-dams/ [https://pe

the original dam construction is what causes major environmental degradation.[49] Moreover, compared with large conventional hydropower, small hydropower facilities require less water flow, take up less space, and do not require reservoirs.[50]

On a per-dam basis, powering NPDs has the greatest potential for increasing hydropower capacity.[51] An NPD's power potential is equivalent to twelve nuclear power plants.[52] Developers originally constructed the NPDs that would be targeted for hydropower generation facilities for other purposes such as navigation, flood control, water supply, and recreation.[53] Developers can add power generation capabilities to the NPD's existing infrastructure without interfering with the NPD's original purpose.[54] Therefore, the negative environmental impact resulting from construction would be minimal because the dam would not require significant alteration.[55]

The DOE deems grid reliability and resiliency paramount factors in protecting the U.S. power grid.[56] The United States designed its grid management principles when generation could be scheduled relatively precisely to meet the appropriate energy production demand.[57] Unfortunately, increasing renewable energy sources that produce varying amounts of energy throughout the day, such as wind and solar, interfere with proper grid management, threatening grid reliability and resiliency.[58] Wind and solar energy are unpredictable because minimal energy

rma.cc/ZDW3-DLKX] (listing NPD power potential); *see also* U.S. DEP'T OF ENERGY, *supra* note 5, at 57 (mentioning limited ecological impact). Putting hydropower facilities on existing dams decreases the construction costs and allows the power to be brought online faster. *See* Petz, *supra*.

49. *See* Shannon Morrissey, Note, *FERC and USACE: The Necessity of Coordination in Implementation of the Hydropower Regulatory Efficiency Act*, 48 U.C. DAVIS L. REV. 1581, 1588 (2015) (arguing powering NPD not harmful to environment).

50. *See* Warren, *supra* note 5, at 151 (pointing out positives of small hydro).

51. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 95 (discussing sustainable hydropower).

52. *See* Young & Ciocci, *supra* note 8, at 10 (explaining NPD power potential). The power potential is 12,000 megawatts. *Id.* at 9-10. This power can be attained without substantial greenhouse gas emission because hydropower generation does not require the combustion of fossil fuels. *See* Morrissey, *supra* note 49, at 1588 (discussing sustainability of hydropower). Hydropower production is renewable because it uses the natural hydrologic cycle to produce energy instead of finite resources. *Id.*

53. *See* James et al., *supra* note 19, at 99 (indicating NPDs created for purposes other than power); *see also* OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, *supra* note 27 (listing other purposes for NPD creation).

54. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 148 (identifying possible conflicts avoidable).

55. *See id.* (explaining minimal construction required to alter existing NPDs); Abassi & Abassi, *supra* note 43, at 2139 (highlighting construction's negative externalities); James et al., *supra* note 19, at 99 (discussing intended uses of NPDs); *see also* OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY, *supra* note 27 (discussing reasons dams created).

56. *See supra* notes 2-4 and accompanying text (summarizing DOE report). The DOE reevaluated energy policies after the 2003 power blackout in North America. *See* James, *supra* note 19, at 128 (discussing grid reliability).

57. *See* James et al., *supra* note 19, at 129-30 (expounding grid reliability concerns regarding variable energy resources).

58. *See id.*

is produced on cloudy days or days with no wind.[59] Dependable baseload generation, or the ability to produce energy at sustained levels, alleviates this issue by protecting grid reliability and resiliency.[60]

Hydropower provides inexpensive baseload generation.[61] Some hydropower facilities can also attain maximum output relatively quickly, providing essential back-up generation during electrical outages.[62] Attaining maximum output quickly allows hydropower facilities to meet fluctuating energy demands throughout the day.[63] Furthermore, in addition to providing baseload generation, and therefore supporting a resilient and reliable grid, hydropower development will also create a large number of hydropower-related jobs.[64] If powering small NPDs avoids the extensive ecological problems associated with large dams, is relatively cheap, and will positively impact the energy grid, why is there virtually no effort to develop NPDs?[65]

B. Small Hydropower Regulatory Process

1. Effect of Licensing Inefficiencies

An outdated licensing scheme makes small hydropower projects cost-prohibitive and unattractive to investors.[66] The current licensing process requires a small hydropower facility to go through the same complex, time-consuming licensing process as a major project the size of the Hoover Dam.[67] The small

59. *See* Marquez, *supra* note 23, at 167 (indicating other renewables unreliable).

60. *See* U.S. DEP'T OF ENERGY, *supra* note 2, at 5 (explaining importance of baseload power production). Baseload generation plants typically have low fuel costs and use fuel efficiently. *See id.*

61. *See* Morrissey, *supra* note 49, at 1587 (evaluating attractive characteristics of hydropower). The most expensive part of producing hydroelectric power is building a dam. Lea Kosnik, *Balancing Environmental Protection and Energy Production in the Federal Hydropower Licensing Process*, 86 LAND ECON. 444, 450 (2010) (describing fiscal reliability of hydropower dams). Once a dam is built, the "maintenance and operation costs are minimal"; therefore, hydropower is extremely cost-effective. *See id.*

62. *See* Office of Energy Efficiency & Renewable Energy, *Benefits of Hydropower*, U.S. DEP'T OF ENERGY, https://energy.gov/eere/water/benefits-hydropower [https://perma.cc/T6F6-2QTC] (listing benefits of hydropower).

63. *See* Young & Ciocci, *supra* note 8, at 9 (justifying importance of hydropower). Due to its flexibility in power production, hydropower allows for intermittent energy sources like wind and solar to be integrated into the grid. *See id.*

64. *See* Michael R. Pincus et al., *Hydro Power*, *in* ENVIRONMENT, ENERGY, AND RESOURCES LAW: THE YEAR IN REVIEW 2016, at 171, 171 (AM. BAR ASS'N 2017), https://www.jw.com/wp-content/uploads/2017/05/YIR-2016.pdf [https://perma.cc/Q63C-RDN9] (discussing possible results of hydropower development); *see also* Morrissey, *supra* note 49, at 1588 (estimating possible number of jobs created). Jobs affiliated with hydropower include project development, construction, and maintenance. Morrissey, *supra* note 49, at 1588.

65. *See infra* Section II.B.1 (explaining impediments to NPD development).

66. *See* Warren, *supra* note 19, at 926 (indicating regulatory scheme hinders small hydropower development).

67. *See* Warren, *supra* note 11, at 250 (labeling hydropower regulatory process expensive and time consuming). The process costs more than the technology itself and takes an extensive amount of time to complete. *See id.*

hydropower licensing process also takes longer and costs more money than the licensing process of other renewables.[68] Furthermore, regulatory costs can account for as much as 30% of the total project cost.[69] These factors all hinder the development of small hydropower.[70]

The antiquated and inefficient licensing system causes the lack of small hydropower development.[71] The licensing process makes it difficult to estimate the cost of powering an NPD, and the cost of complying with FERC regulations can exceed the cost of the facility itself.[72] Therefore, uncertainty in the licensing process, and the overall complexity of creating a revenue-generating facility, adversely affects developers' and investors' incentive to power NPDs.[73]

2. Principal Statutes Impacting Small Hydropower Development

Several federal statutes regulate hydropower development.[74] Congress originally enacted the statutes to protect the environment and mitigate the damage caused by large hydropower projects.[75] While originally enacted to protect the environment, the regulations increase the development costs for projects—regardless of size—and hinder small hydropower development.[76]

The Federal Water Power Act, later renamed the Federal Power Act (FPA), was the first national policy geared directly towards hydropower development

68. *See* Cumming, *supra* note 10, at 931 (discussing hydropower development); *see also* Warren, *supra* note 11, at 260 (elaborating on small hydropower licensing). Powering NPDs does not require new dams or the creation of large reservoirs, and therefore should not be subject to the same extensive regulatory process as large hydropower projects. *See* Warren, *supra* note 11, at 260. It took approximately fifteen years from application to operation for the twenty-nine hydropower projects that came online between 2005 and 2013. *See* Ingram, *supra* note 35 (evaluating DOE findings of lengthy and complicated process). In the fall of 2017, FERC had sixteen licensing decisions that had been pending for more than ten years, and thirteen that had been pending for five to ten years. Mary Anne Sullivan & Zachary Launer, *How FERC is Streamlining Hydropower Licensing*, LAW360 (Nov. 17, 2017), https://www.law360.com/articles/986387/how-ferc-is-streamlining-hydropower-licensing [https://perma.cc/5SWW-NN27] (describing new FERC policy statement).

69. *See* LOFTHOUSE ET AL., *supra* note 42, at 16 (evaluating developer's difficulty finding funding). Hydropower projects require a lot of up-front capital and take a long time to return initial investments. *See id*. at 12. Some older small dams exist solely because removing them would be too expensive. *See* James et al., *supra* note 19, at 144 (discussing aging infrastructure). Powering small NPDs would create revenue that could pay for the removal of other small NPDs not suitable for energy production. *See id.*

70. *See* Warren, *supra* note 19, at 926 (discussing regulatory hindrances); Cumming, *supra* note 10, at 931-32 (stating licensing costs disincentive development).

71. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 51 (stating regulations hinder development).

72. *See* James et al., *supra* note 19, at 105 (pointing out estimating cost of powering NPDs difficult to calculate); Cumming, *supra* note 10, at 931-32 (discussing costs of licensing).

73. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 51 (describing effect of antiquated regulatory process).

74. *See* LOFTHOUSE ET AL., *supra* note 42, at 18-19 (summarizing primary federal statutes regulating hydropower development); *see also Federal Statutes*, FED. ENERGY REG. COMMISSION (Aug. 15, 2018), https://www.ferc.gov/legal/fed-sta.asp [https://perma.cc/YX7X-GHJW] (listing all statutes FERC must comply with).

75. *See* LOFTHOUSE ET AL., *supra* note 42, at 18 (explaining negative effect of regulation).

76. *See id*. The policies discourage projects that have minimal environmental effects by making it difficult to acquire a license. *See id.*

regulation.[77] Congress enacted the FPA in response to the drastic increase of hydropower projects during the early 1900s.[78] The FPA codified hydropower permitting and licensing processes.[79] Moreover, the FPA gives FERC exclusive regulatory and licensing authority over all hydropower facilities that develop and transmit power.[80]

Almost all hydropower projects require a license, or an exemption from licensing, from FERC.[81] The three types of authorizations FERC grants are conduit exemptions, 10-megawatt exemptions, and licenses.[82] The FERC licensing process is the most detrimental factor to the development of small hydropower.[83]

77. *See* Federal Water Power Act, ch. 285, 41 Stat. 1063 (1920) (codified as amended at 16 U.S.C. §§ 791a-823d (2018)); Freeman, *supra* note 10, at 360 (mentioning reasons FPA enacted); Warren, *supra* note 19, at 933 (noting novelty of FPA). Congress enacted the Federal Water Power Act in 1920, amended it in 1935 and 1986, and renamed it the FPA. *See* Warren, *supra* note 19, at 933 (stating reason for FPA to establish comprehensive plan for nation's waters); Morrissey, *supra* note 49, at 1589 (summarizing roots of FPA). Congress's 1986 amendments, effectuated through the Electric Consumers Protection Act, require FERC to give equal consideration to both the environment and potential power capabilities when licensing a site. *See* Megan Hooker, *Recreation and Aesthetics in the Public Interest: History and Overview of Hydropower License Denials by the Federal Energy Regulatory Commission*, 29 J. ENVTL. L. & LITIG. 87, 90 (2014) (discussing FPA amendments and requirement plans best adapted to both goals). FERC must attach appropriate conditions to licenses in order to protect, or mitigate damage to, wildlife and the environment. *See* Heather Payne, *A Long Slog: What A Ten Year Hydroelectric Relicensing Process Demonstrates About Public Participation and Administrative Regulation Theories*, 53 IDAHO L. REV. 41, 54 (2017) (discussing FERC licensing and monitoring process).

78. *See* Morrissey, *supra* note 49, at 1589 (explaining why FPA enacted).

79. *See id.*

80. *See* James et al., *supra* note 19, at 108 (outlining FERC jurisdiction). The FPA gives FERC jurisdiction over the nation's new and preexisting non-federal hydropower resources located on navigable waters or affecting interstate commerce. *See id.*; *Small/Low-Impact Hydropower Projects: Do I Need Approval From Ferc?*, FED. ENERGY REG. COMMISSION, https://www.ferc.gov/industries/hydropower/gen-info/licensing/small-low-impact/get-started/authorization.asp [https://perma.cc/HR7H-TZBY] (listing FERC authorizations). FERC's regulatory authority supersedes state regulatory authority. *See* First Iowa Hydro-Elec. Coop. v. Fed. Power Comm'n, 328 U.S. 152, 162 (1946) (stating FERC interpretation of FPA supersedes state law).

81. *See* 16 U.S.C. § 817 (2018) (listing projects requiring FERC authorization). A project needs a license or an exemption if the project:

> [i]s located on a navigable waterway of the United States; [o]ccupies lands of the United States; [u]ses surplus water or waterpower from a government dam; or [i]s located on a stream over which Congress has Commerce Clause jurisdiction, is constructed or modified on or after August 26, 1935, and affects the interests of interstate or foreign commerce.

Small/Low-Impact Hydropower Projects: Do I Need Approval from Ferc?, *supra* note 80 (providing licensing requirement guidance).

82. *See Small/Low-Impact Hydropower Projects*, FED. ENERGY REG. COMMISSION, https://www.ferc.gov/industries/hydropower/gen-info/licensing/small-low-impact.asp [https://perma.cc/QAL7-6GZ9] (outlining specific FERC authorizations).

83. *See supra* note 5 and accompanying text (stating licensing process hurdle to hydropower development). Due to the significant impact of the FERC licensing process, this Note discusses the licensing process in further detail. *Infra* Section II.C (discussing FERC licensing process).

Congress enacted the Clean Water Act (CWA) to combat water pollution by, in relevant part, regulating "the discharge of pollutants into the navigable waters."[84] While hydropower dams do not pollute rivers, they must still comply with the CWA as they generally discharge water from one side of the dam to the other.[85] Consequently, hydropower facilities must obtain a section 401 water quality certificate from the state before they can acquire a license or conduct any activity on the site.[86] FERC cannot issue a license until the proper state authority has issued, or waived, the water quality certificate.[87] The water quality certificate issued by the state authority may include state terms and conditions that FERC must include in the eventual license.[88] The section 401 water quality certification process is usually extremely time-consuming and further complicates hydropower licensing.[89]

Similarly, Congress enacted the National Environmental Policy Act (NEPA) to balance human development with environmental protection.[90] NEPA requires a developer to create a detailed statement of the proposed project's environmental impacts.[91] The process begins with scoping, wherein FERC analyzes the project and decides whether the developer must prepare a Categorical Exclusion

84. *See* Clean Water Act § 101(a), 33 U.S.C. § 1251(a) (2018) (identifying CWA's purpose); Warren, *supra* note 19, at 943 (describing CWA origin). Congress originally passed the Federal Water Pollution Control Act in 1948, and changed the name to the CWA after amending it in 1972. *See* Warren, *supra* note 19, at 943.

85. *See* Warren, *supra* note 19, at 944 (describing CWA specifications relevant to hydropower); *see also* S.D Warren Co. v. Me. Bd. of Envtl. Prot., 547 U.S. 370, 375-76 (2006) (determining "discharge" encompasses water from dams despite lack of pollutants).

86. *See* 33 U.S.C. § 1341(a)(2) (requiring state consultation); Warren, *supra* note 19, at 944 (outlining section 401 permit requirements under CWA). Some dams may also require section 404 certification because their construction requires dredging and the movement of other material in the waterway. *See* 33 U.S.C. § 1344; Morrissey, *supra* note 49, at 1597 (describing section 404 requirements). Because a majority of NPDs can be powered without any significant infrastructure change, this Note will not discuss section 404. *See supra* note 48 and accompanying text (explaining powering NPDs requires little change to existing structure).

87. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 137 (describing CWA process). States have significant power over hydropower licensing because of the necessity of a state permit before FERC can proceed. *See* Thomas Russo, *Required State-Level Natural Gas and Hydropower Approvals Threatening Growth*, NAT. GAS & ELECTRICITY, Nov. 2017, at 29, 29 (asserting states "hijacked . . . and weaponized" licensing process).

88. *See* Russo, *supra* note 87, at 29 (highlighting state control over process); *see also* Warren, *supra* note 19, at 944 (outlining state power over CWA process). States have increasingly used the section 401 water quality certification process to influence government-controlled development. *See* Warren, *supra* note 19, at 944-52 (emphasizing FERC must incorporate conditions into permit and describing state influence).

89. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, AD13-9-000, REPORT ON THE PILOT TWO-YEAR HYDROELECTRIC LICENSING PROCESS FOR NON-POWERED DAMS AND CLOSED-LOOP PUMPED STORAGE PROJECTS AND RECOMMENDATIONS PURSUANT TO SECTION 6 OF THE HYDROPOWER REGULATORY EFFICIENCY ACT OF 2013, at 41-42 (2017), https://www.ferc.gov/legal/staff-reports/2017/final-2-year-process.pdf [https://perma.cc/R9MD-XB23] (explaining time consuming section 401 process). A section 401 water quality certification takes an average of 411 days and a median of 356 days from application to issuance or waiver. *See id.* at 42.

90. *See* National Environmental Policy Act of 1969, Pub. L. No. 91-190, § 101, 83 Stat. 852, 852 (1970) (setting forth goals of new policy).

91. *See* FED. ENERGY REGULATORY COMM'N., HYDROPOWER PRIMER: A HANDBOOK OF HYDROPOWER BASICS 20 (2017), https://www.ferc.gov/legal/staff-reports/2017/hydropower-primer.pdf [https://perma.cc/XDA3-U6F8] (examining NEPA process and detailing factors agencies must consider).

(CATEX) document, an environmental analysis (EA), or an environmental impact statement (EIS).[92] The developer documents the initial scoping process and then releases it to the public for comment and revision.[93]

NEPA's procedural requirements can consume great amounts of time and be financially draining.[94] Drafting and producing an EA or an EIS can take up to two and five years, respectively.[95] In addition to the potentially extensive time commitment, hiring the experts necessary to properly prepare an EA or EIS can cost upwards of $250 an hour.[96] For potential small hydropower facilities, the extended compliance time frame coupled with the cost of compliance can make projects unattractive and dissuade development.[97]

3. Other Statutes Complicating Hydropower Development

While FPA, CWA, and NEPA are the major complex regulations bogging down hydropower development, there are numerous other laws that can potentially hinder small hydropower development.[98] The Fish and Wildlife Coordination Act requires FERC to consult with state agencies regarding the conservation of, and a project's effect on, wildlife resources.[99] The Act also requires subsequently issued licenses to contain provisions for the protection of wildlife based on the state agencies' recommendations.[100]

92. *See* FED. ENERGY REGULATORY COMM'N, *supra* note 91, at 21 (describing scoping process); FED. ENERGY REGULATORY COMM'N, HYDROPOWER LICENSING—GET INVOLVED 10-11 (2016), https://www.ferc.gov/resources/guides/hydropower/hydro-guide.pdf [https://perma.cc/F6HB-YMHH] (explaining scoping); Hansen et al., *supra* note 5, at 4 (detailing possible NEPA requirements). If the project will not have any significant environmental impact, then it may be categorically excluded and the developer merely produces a CATEX. *See* Hansen et al., *supra* note 5, at 4. For projects that will have an environmental impact, an EA is required. *Id.* If the EA indicates the project will produce significant impact an EIS is required to identify the project's specific effects on the environment, and any potential alternatives. *Id.*

93. *See* FED. ENERGY REG. COMM'N., *supra* note 91, at 21 (explaining scoping requirements). The public commenting period can change the type of statement prepared or result in further analysis of the site if the comments identify issues not originally taken into account. *See id.* The public commenting period can also result in revisions to the final EA or EIS if the comments highlight new issues. *See id.*

94. *See* Hansen et al., *supra* note 5, at 4-5 (stressing NEPA procedural timeframes costly). Many of the documents required to satisfy NEPA are also needed to comply with FERC requirements. *See id.* at 4. Although this appears to be killing two birds with one stone, unfortunately many of the documents must be prepared and submitted separately. *See id.* This requirement results in wasted money, time, and effort by the entity proposing the project as well as the agencies involved in creating the documents. *See id.*

95. *See id.* (estimating time and costs of compliance).

96. *See id.* at 5 (providing examples of costs).

97. *See id.* Paying consultants and experts, over a possibly protracted period of time, is part of the overall cost of compliance. *See id.* With costs of equipment included, compliance for an EIS can reach upwards of hundreds of thousands of dollars. *See id.* EA compliance can reach into the tens of thousands of dollars. *See id.*

98. *See supra* note 74 and accompanying text (mentioning mass amount of federal regulation).

99. *See* Fish and Wildlife Coordination Act, § 1, 16 U.S.C. § 661 (2018); U.S. DEP'T OF ENERGY, *supra* note 5, at 137 (summarizing act).

100. U.S. DEP'T OF ENERGY, *supra* note 5, at 137 (describing Fish and Wildlife Coordination Act's requirements).

Another regulation with the potential to hinder small hydropower development, the National Historic Preservation Act (NHPA) requires FERC to consider how a proposed project might affect historic property.[101] Historic properties are man-made objects that are at least fifty years old.[102] Because many of the nation's dams are relatively old, any development of NPD's will likely result in some change to the existing infrastructure, and will therefore trigger the NHPA.[103] The extensive analysis, coordination, and possible planning needed to mitigate effects to historic property takes time and money, which adds to possible unprofitability of small hydropower projects and further deters development.[104]

Similarly, during the licensing process, under the Endangered Species Act (ESA) the Fish and Wildlife Service (FWS) must determine if the proposed project could negatively impact endangered or threatened species or their habitats.[105] If FWS determines that endangered species may be present in the area, FERC "may be required to prepare a biological assessment" of the area to determine the possible impacts of the project.[106] Depending on the multitude of factors involved in the biological assessment, compliance can be costly and time-consuming.[107]

101. *See* National Historic Preservation Act § 3, 54 U.S.C. §§ 300308, 306108 (2018) (defining historic property and precluding federal funding until historic property considered); LOFTHOUSE ET AL., *supra* note 42, at 19 (criticizing NHPA's effect on hydropower licensing). The NHPA was intended to protect the nation's historic sites, but it results in an unnecessary impediment to licensing small hydropower developments by adding yet another layer of paperwork. *See* LOFTHOUSE ET AL., *supra* note 42, at 19. Once the developer or FERC identifies historic structures, developers must pay experts to analyze the project's possible impacts to the structures. *See* Hansen et al., *supra* note 5, at 6.

102. *See* Hansen et al., *supra* note 5, at 6 (focusing on NHPA's wide-ranging impediment to small hydropower development). Developers must compensate for the long licensing process by accounting for objects that are forty-five years old as well. *See id.* FERC must take into account any structure that is eligible for protection. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 137 (asserting FERC bound by provisions of NHPA).

103. *See* Hansen et al., *supra* note 5, at 6 (stating small NPD infrastructure in good condition).

104. *See id.* (discussing NHPA impediments). The NHPA process requires professional analysis, public input, specialized advice from industry leaders, and most importantly, more time and money. *See id.*

105. *See* Endangered Species Act § 7, 16 U.S.C. § 1536 (2018) (establishing base interagency cooperation requirements); U.S. DEP'T OF ENERGY, *supra* note 5, at 137 (summarizing ESA).

106. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 137 (summarizing ESA requirements). FWS frequently requires biological assessments when the project is not located in an area that is critical to the endangered species habitat, but is close to the habitat. *See* Hansen et al., *supra* note 5, at 6 (explaining possible long and wide-ranging biological assessments). Some surveys must take place during specific seasons if, for example, the species possibly impacted is migratory and only present during a certain time of the year. *See id.* FWS and state wildlife agencies must concur with the findings of the biological assessment, which can necessitate potentially lengthy negotiations between the agencies. *See id.*

107. *See* Hansen et al., *supra* note 5, at 6 (outlining potential impediments). FERC generally waits to issue a license until FWS has reviewed the biological assessment and issued a corresponding opinion. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 137. The opinion of the biological assessment usually contains terms and conditions and FERC generally includes those terms and conditions in the license. *See id.*

Alone, none of the previously discussed federal regulations are specifically to blame for the difficulties of efficiently developing small hydropower.[108] Nevertheless, the interlocking web of the hydropower regulatory system spells death by a thousand cuts for small hydropower development.[109] Given the effect that the fore mentioned regulations have on small hydropower licensing, it is necessary to fundamentally understand the licensing process to appreciate the government's attempts to expedite it.[110]

C. FERC Hydropower Licensing

Pursuant to the FPA, FERC issues licenses and exemptions from licensing for hydropower projects.[111] FERC issues both new and original licenses—the former for a facility renewing a license, and the latter for a facility seeking its first license.[112] The renewal process can be just as time consuming and expensive as the original licensing process.[113]

FERC offers one path through the exemption process and three paths through the licensing process—the Integrated Licensing Process (ILP), the Traditional Licensing Process (TLP), and the Alternative Licensing Process (ALP).[114] Before a project enters any of the processes, the developer may obtain a preliminary permit from FERC.[115] A preliminary permit gives the developer priority over other potential developers as well as three years to assess the feasibility of the project at the site.[116]

108. *See* Hansen et al., *supra* note 5, at 7 (concluding complexity of regulatory system impediment to small hydropower development).

109. *See supra* note 5 and accompanying text (listing sources stating regulatory system paramount reason small hydropower not developed).

110. *See infra* Section II.C (explaining licensing process).

111. *See* Federal Power Act § 23(b), 16 U.S.C. § 817 (2018) (giving hydropower licensing responsibility to FERC); *Small/Low-Impact Hydropower Projects: Do I Need Approval From Ferc?*, *supra* note 80 (providing differences between licenses and exemptions); *supra* note 81 (discussing when FERC license necessary).

112. *See* FED. ENERGY REGULATORY COMM'N, *supra* note 92, at 4; Cumming, *supra* note 10, at 933-34 (differentiating between new and original licenses). New and original licenses are granted for terms of thirty to fifty years. *See* FED. ENERGY REGULATORY COMM'N, *supra* note 92, at 4; Cumming, *supra* note 10, at 933. Because the United States built most of its hydropower dams in the mid-1900s, many dams will require new licenses in the near future. *See* Cumming, *supra* note 10, at 934.

113. *See* Cumming, *supra* note 10, at 934 (stating cost and timing problems with relicensing); *see also* James et al., *supra* note 19, at 109 (reiterating licensing process complex and time consuming). The license renewal process allows stakeholders and the public to influence the terms of the new license. *See* Rick Eichstaedt et al., *More Dam Process: Relicensing of Dams and the 2005 Energy Policy Act*, ADVOC., JUNE/JULY 2007, at 33, 33 (discussing web of bureaucracies involved in relicensing).

114. *See* James, *supra* note 19, at 110-11 (detailing FERC exemption process); *Licensing Processes*, FED. ENERGY REG. COMMISSION (May 1, 2017), https://www.ferc.gov/industries/hydropower/gen-info/licensing/matrix.asp [https://perma.cc/LGC2-EP9E] (outlining three licensing processes in detail). FERC's default licensing process is the ILP. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 138 (summarizing licensing process).

115. *See* Federal Power Act § 4(f), 16 U.S.C. § 797(f) (2018) (providing FERC authority to issue preliminary permit); *see also* FED. ENERGY REGULATORY COMM'N, *supra* note 92, at 4 (summarizing preliminary permits).

116. *See* FED. ENERGY REGULATORY COMM'N, *supra* note 91, at 29 (explaining effect of having preliminary permit). FERC issues a preliminary permit for the developer to conduct feasibility studies, environmental studies,

The 2005 Energy Policy Act added the ILP.[117] The ILP front-loads as much of the licensing process as possible to identify and resolve potential issues in the beginning of the process.[118] The ILP best suits complex projects that require in-depth studies and coordination with stakeholders in the pre-filing phase.[119]

In 1985, responding to inefficient original licensing, FERC revised the licensing process and created the TLP.[120] The TLP, counter to the ILP, generally involves little to no FERC engagement in the pre-filing stage.[121] FERC's limited involvement in the TLP makes the process better suited for less complex projects that require minimal studies and analysis.[122]

and consult with possible stakeholders. *See id.* A preliminary permit does not authorize the developer to break ground or alter the site in any manner. *See id.* The developer typically prepares an application for an original license during the three-year period. *See* Cumming, *supra* note 10, at 933 (summarizing preliminary permit goals). If the developer is unable to prepare a license application in three years, upon a showing of a good faith attempt and reasonable diligence, FERC may grant the developer a two-year extension. *See* 16 U.S.C. § 798(b); FED. ENERGY REGULATORY COMM'N, *supra* note 91, at 29 (mentioning extension standard). A developer may file for a preliminary permit before applying for a license, but must conduct the FERC mandated pre-filing process before applying for a license. *See* FED. ENERGY REGULATORY COMM'N, *supra* note 91, at 30 (listing pre-filing requirements). In order to fulfill the pre-filing process requirements, the developer must inform and adequately consult with all of the potential stakeholders. *See id.* At the conclusion of the pre-filing process, the applicant has a complete license application and enters into one of the three licensing processes. *See id.* at 31.

117. *See* Energy Policy Act of 2005, Pub. L. No. 109-58, § 241, 119 Stat. 594, 674 (2005); Sonya F.P. Ziaja, *Rules and Values in Virtual Optimization of California Hydropower*, 57 NAT. RES. J. 329, 343 (2017) (asserting origin of Energy Policy Act).

118. *See* Kalen, *supra* note 39, at 38 (analyzing ILP). FERC involvement in the ILP is hands on, and continues throughout the entire licensing process. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 138 (summarizing benefits of ILP). The ILP merges pre-filing consultation and the NEPA process to resolve disputes at the outset and maximizes opportunity for federal and state agencies to coordinate. *See id.*; *see also* FED. ENERGY REGULATORY COMM'N, *supra* note 91, at 32 (laying out ILP steps and timeline).

119. *See* FED. ENERGY REGULATORY COMM'N, *supra* note 91, at 32 (characterizing FERC coordination during ILP).

120. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, REPORT ON HYDROELECTRIC LICENSING POLICIES, PROCEDURES, AND REGULATIONS COMPREHENSIVE REVIEW AND RECOMMENDATIONS PURSUANT TO SECTION 603 OF THE ENERGY ACT OF 2000, at 19 (2001), https://www.ferc.gov/legal/maj-ord-reg/land-docs/ortc_final.pdf [https://perma.cc/5YJX-5LNX] (explaining pre-1985 inefficiencies). During this time, many applicants failed to conduct proper studies necessary to evaluate their projects and FERC had to reject their applications. *See id.* Without the proper studies, the applicant could not adequately consult with stakeholders and the repeated problem of not being properly prepared wasted time and money. *See id.*

121. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 138 (mentioning differences between licensing processes); *see also Licensing Processes*, *supra* note 114 (detailing differences between licensing processes). In the TLP, FERC begins the scoping process after the license has been filed as opposed to before. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 138.

122. *See* FED. ENERGY REGULATORY COMM'N, *supra* note 91, at 33 (outlining steps and timeline of TLP). The TLP does not have set deadlines for pre-filing requirements. *Id.* The TLP is the required licensing process for facilities taking advantage of the small hydropower exemption. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at 4 (listing different licensing processes).

A developer must receive permission from FERC to use the ALP.[123] The ALP requires extensive collaboration between stakeholders and the developer.[124] In the ALP, NEPA scoping begins in the pre-filing phase and FERC takes an advisory role in pre-filing activity.[125]

Some qualifying small hydroelectric projects may go through the exemption process as opposed to one of the three licensing processes.[126] The term "exemption," however, is quite deceptive because the process for exemption from licensing is substantially similar to, and rarely any simpler than, the licensing process.[127] The pre-filing process for an exemption is the same pre-filing process as the TLP.[128] The difference between an exemption and a license is that a license is granted for a period of thirty to fifty years, while an exemption never expires.[129] Therefore, an exemption is not an exemption from licensing, but rather an exemption from relicensing.[130]

D. Efforts by the Government to Streamline Hydropower Licensing

FERC is aware that the regulatory web is inefficient and puts a significant burden on hydropower development.[131] In 2001, FERC issued a report recognizing that changes in its own policies and regulations were necessary to reduce

123. *See* FED. ENERGY REGULATORY COMM'N, *supra* note 91, at 32 (outlining ALP and process for requesting use of ALP). To use the ALP, a developer must submit a written justification for using the process accompanied by written comments on the proposal and any responses to those comments. *See id.*

124. *See id.* at 33 (specifying developers and stakeholders drive ALP). The developer and stakeholders develop the timelines and deadlines as opposed to FERC. *See id.* If the developer and stakeholders agree on deadlines and necessary information for the project, the participants can accomplish the prefiling consultation and environmental review process simultaneously. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 120, at 28 (pointing out possible advantage of ALP).

125. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 120, at 27-28 (comparing TLP and ALP).

126. *See* 16 U.S.C. § 2705(d) (2018) (codifying exemptions); FED. ENERGY REGULATORY COMM'N, *supra* note 91, at 35 (outlining exemption criteria); *see also* James et al., *supra* note 19, at 110-11 (summarizing exemption qualifications and process). There are two categories of exemptions. FED. ENERGY REGULATORY COMM'N, *supra* note 91, at 35. A facility located on a conduit originally used for a purpose other than hydroelectric generation that would generate less than forty megawatts is eligible for an exemption. *Id.* (listing steps of exemption process); James et al., *supra* note 19, at 110 (explaining eligibility for exemption). Projects proposed on existing nonfederal dams or natural water features, which do not require the construction of a dam that would produce less than ten megawatts, are also eligible for an exemption. *See* FED. ENERGY REGULATORY COMM'N, *supra* note 91, at 35.

127. *See* James et al., *supra* note 19, at 110-11 (explaining misleading exemption label); Warren, *supra* note 19, at 959 (asserting exemptions not actually exemptions from lengthy licensing process); *see also* FED. ENERGY REGULATORY COMM'N, *supra* note 91, at 35 (listing exemption process steps). The right to eminent domain comes with the grant of a license but is not included in the grant of an exemption. *See* FED. ENERGY REGULATORY COMM'N, *supra* note 91, at 35 (explaining impacts of not having eminent domain).

128. *See* FED. ENERGY REGULATORY COMM'N, *supra* note 91, at 35 (listing exemption process steps); *supra* notes 121-122 and accompanying text (explaining TLP licensing process).

129. *See* Warren, *supra* note 19, at 960 (reviewing purpose and effect of perpetual license).

130. *See id.* (explaining exemption characteristics).

131. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 120, at 5-6 (evaluating reasons for inefficient licensing). FERC recognized that the median time from filing a license to the conclusion of the process

licensing process inefficiencies, but, at the same time, asserted that legislative reform was the only true fix to the licensing process.[132] Since the 2001 report, FERC and Congress have implemented a number of measures intended to fix the inefficient licensing process.[133]

Congress signed the Energy Policy Act of 2005 (EPAct) into law in August 2005.[134] Congress enacted the EPAct to promote renewable energy with an emphasis on hydropower development.[135] The principal change was the elimination of NEPA review for small hydropower located on land governed by the Bureau of Reclamation.[136] Unfortunately, Congress focused on hydropower located on Bureau of Reclamation land and relicensing as opposed to original licensing.[137]

President Obama signed the Bureau of Reclamation Small Conduit Hydropower Development and Rural Jobs Act (Reclamation Act) in 2013.[138] The Reclamation Act authorizes the Secretary of Interior to enter into small hydropower development contracts for Bureau of Reclamation-owned canals, pipelines, and aqueducts.[139] The Reclamation Act eliminates NEPA requirements for eligible

was forty-three months, with many proceedings taking much longer. *See id.* at 5. FERC asserted that the dispersal of decision-making powers in the current statutory scheme causes the delays. *See id.* Congress is also aware of the regulatory burden, and has recently introduced hydro-related bills. *See* Courtney Krause et al., *Incorporating Small-Scale Hydropower Projects into Our Energy Future*, NAT. RESOURCES & ENV'T, Spring 2016, at 3, 7 (mentioning two bills in Congress).

132. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 120, at 5-6 (summarizing findings of report); *see also* U.S. DEP'T OF ENERGY, *supra* note 5, at 143 (summarizing the 2001 report). "Changes in [FERC] regulations and policies may also assist in reducing the time and cost of licensing, although they are not an adequate substitute for legislative reform." STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 120, at 6.

133. U.S. DEP'T OF ENERGY, *supra* note 5, at 144 (summarizing efforts to decrease licensing inefficiency).

134. *See* Energy Policy Act of 2005, Pub. L. No. 109-58, § 241, 119 Stat. 594, 674 (2005) (revising federal policy concerning renewable energy). EPAct directed federal agencies to conduct studies concerning the viability of hydropower development at federal facilities. *See* James et al., *supra* note 19, at 103. The resulting studies indicated that few large-scale hydropower sites are available, opening the door for more extensive exploration of small-scale sites. *See id.* at 103-04.

135. *See* Morrissey, *supra* note 49, at 1590 (explaining congressional intent behind EPAct).

136. *See id.* at 1590-91 (summarizing EPAct). NEPA review can be long and expensive. *See supra* notes 94-96 and accompanying text (describing NEPA process). The EPAct also expedited resolution of possible mandatory conditions and allowed developers or other parties to propose alternative conditions to FERC conditions on licenses. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 136 (listing EPAct changes); Tarlock, *supra* note 11, at 1761-62 (explaining in depth effect of EPAct); *see also* Eichstaedt et al., *supra* note 113, at 33-34 (summarizing EPAct implications).

137. *See* Tarlock, *supra* note 11, at 1761 (addressing reasons for EPAct); Morrissey, *supra* note 49, at 1590-91 (outlining EPAct).

138. Bureau of Reclamation Small Conduit Hydropower Development and Rural Jobs Act, Pub. L. No. 113-24, 127 Stat. 498 (2013) [hereinafter Hydropower Development and Rural Jobs Act] (promoting rural hydropower).

139. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 136 (mentioning Reclamation Act's principal effect); Warren, *supra* note 11, at 263 (describing Reclamation Act). To use the conduit, the proposed project must be compatible with the conduit's current use and cannot create any "unmitigated financial or physical impacts to the [conduit]." *See* Hydropower Development and Rural Jobs Act, sec. 2, § 9(c)(6) (providing terms for eligible conduits); Warren, *supra* note 11, at 263-64 (explaining requirements of eligibility).

facilities because eligible facilities are small, already built, and therefore do not have serious environmental risks.[140]

E. The HREA

1. Generally

In August 2013, President Obama signed the HREA into law, the legislation with the greatest potential for streamlining the hydropower licensing process.[141] Congress intended that the legislation "improve the regulatory process and reduce delays and costs for hydropower development at [NPDs]."[142] To improve the regulatory system, the HREA mandates several changes to the current licensing process.[143]

First, the HREA allows FERC to extend preliminary permits two years beyond the permit's three-year term.[144] Second, the HREA increased the maximum

140. *See* LOFTHOUSE ET AL., *supra* note 42, at 22 (summarizing the Reclamation Act's requirements and positive new aspects). Eligible facilities produce no more than five megawatts of power. Hydropower Development and Rural Jobs Act, sec. 2, § 9(c)(9)(E). Hydropower is especially beneficial to rural areas because it produces funds that farmers can use to pay off debts for irrigation facilities and therefore eases the water user's financial burden. *See The History of Hydropower Development in the United States*, *supra* note 22 (describing Bureau of Reclamation's importance to rural areas). Hydropower pumping facilities also make irrigation of higher elevation locations possible and produce enough energy to provide power for domestic farm purposes. *See id.*

141. *See* Hydropower Regulatory Efficiency Act of 2013, Pub. L. No. 113-23, 127 Stat. 493 (modifying FPA and requiring FERC studies); LOFTHOUSE ET AL., *supra* note 42, at 21; *see also* Michael Harris, *Bill Could Reauthorize EPAct 2005 Sec. 242 and 243 Hydroworld Project Funding*, HYDROWORLD (June 13, 2017), http://www.hydroworld.com/articles/2017/06/bill-could-reauthorize-epact-2005-sec-242-and-243-hydropower-project-funding.html [https://perma.cc/ZWM3-PZ5E] [hereinafter *Bill Could Reauthorize EPAct*] (describing other hydropower reform bills); Michael Harris, *U.S. House Passes Five Hydroelectric Power Bills to Senate, Receives Two More*, HYDROWORLD (June 16, 2017), http://www.hydroworld.com/articles/2017/06/house-passes-five-hydroelectric-power-bills-to-senate-receives-two-more.html [https://perma.cc/2KNJ-S46G] [hereinafter *U.S. House Passes Five Bills*] (mentioning other hydropower reform bills). The vote to pass the HREA resulted in unanimous approval. *See* LOFTHOUSE ET AL., *supra* note 42, at 21 (explaining HREA); Morrissey, *supra* note 49, at 1591 (discussing bipartisan support for HREA).

142. *See* Hydropower Regulatory Efficiency Act of 2013 § 6(a).

143. *See* Morrissey, *supra* note 49, at 1592-93 (listing changes to licensing); *FERC Conforms Its Regulations to Hydropower Regulatory Efficiency Act*, HYDROWORLD (Sept. 24, 2014), http://www.hydroworld.com/articles/2014/09/ferc-conforms-its-regulations-to-hydropower-regulatory-efficiency-act.html [https://perma.cc/37LY-9DES] (discussing HREA effect on licensing process). In September 2014, FERC amended its regulations to comply with HREA. *See FERC Conforms Its Regulations to Hydropower Regulatory Efficiency Act*, *supra* (discussing HREA compliance). The HREA totally exempted qualifying conduit projects from licensing. *See* Hydropower Regulatory Efficiency Act, sec. 4(a)(1), §§ 30(a)(1), (a)(3)(C)(i)-(ii), (b)(2). The HREA conduit exemption applies to facilities located on non-federally owned conduits, with a capacity less than five megawatts that do not utilize a dam or other impoundment. *See id.* sec. 4(a)(1), §§ 30(a)(3)(C)(i)-(ii); Warren, *supra* note 11, at 261 (explaining conduit exemptions). The HREA also increased the capacity for all conduit exemptions to forty megawatts. *See* Hydropower Regulatory Efficiency Act, sec. 4(a)(1), § 30(b)(2).

144. *See* Hydropower Regulatory Efficiency Act, sec. 5, § 5(b) (providing standard for extension of preliminary permit); *see also supra* note 116 (explaining preliminary permit extension standard).

small hydropower licensing exemption from five megawatts to ten megawatts.[145] Third—and most importantly—the HREA required FERC to examine the possibility of implementing a two-year licensing program for hydropower development at NPDs.[146] FERC's goal in implementing a two-year licensing process was to streamline licensing for proposed projects with very minimal environmental effects such as NPDs.[147] While the two-year licensing process is a phenomenal idea, the pilot process did not produce many tangible results.[148]

2. HREA's Two-Year Pilot Licensing Process Result and Response

In 2014, complying with the HREA, FERC issued a notice seeking pilot projects to test the two-year licensing process.[149] To be considered for the pilot two-year process, the project had to meet a number of criteria.[150] Rye Development (Rye) and Wildflower LLC submitted proposals for the two-year pilot process.[151] FERC chose Rye for the pilot process.[152]

145. *See* Hydropower Regulatory Efficiency Act § 3 (amending Public Utility Regulatory Policies Act of 1978); *see also supra* note 126 (explaining exemptions). The HREA amended the Public Utilities Regulatory Policies Act's definition of a small hydropower facility from one that produces five megawatts of energy to one that produces ten megawatts of energy. *See* Morrissey, *supra* note 49, at 1592. One megawatt is enough power to supply a small town. *See* Kosnik, *supra* note 8, at 3254 (exploring small hydropower potential).

146. *See* Hydropower Regulatory Efficiency Act § 6 (providing study parameters); Warren, *supra* note 11, at 262-63 (explaining FERC responsibility to explore two-year licensing). The HREA requires FERC to solicit public comment on the feasibility of a two-year licensing process, develop criteria for the process, and implement the process with pilot projects. *See* Warren, *supra* note 11, at 262-63. The HREA also requires FERC to hold a workshop to evaluate the feasibility of putting a two-year licensing process into effect. *See id.* at 263.

147. *See* Morrissey, *supra* note 49, at 1593 (exploring reasoning for two-year licensing); Rietmann, *supra* note 6, at 226 (asserting pilot project goal). Section 6 explicitly states that the goal is to fix the licensing process for NPDs. *See* Hydropower Regulatory Efficiency Act § 6(a).

148. *See infra* Section II.E.2 (discussing FERC compliance with HREA and results).

149. *See* Kimberly D. Bose, Federal Energy Regulatory Commission, Notice Soliciting Pilot Projects to Test a Two-Year Licensing Process 1 (Jan. 6, 2014), https://www.ferc.gov/media/news-releases/2014/2014-1/AD13-9-000.pdf [https://perma.cc/JXN9-AH65] (reiterating order to commission to conduct pilot process); *see also* Pincus et al., *supra* note 64, at 173 (discussing pilot project).

150. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at 6-7 (listing criteria); *see also* Pincus et al., *supra* note 64, at 173 (summarizing criteria). FERC's criteria are:

> (1) not being continuously connected to a naturally-flowing water feature if the project is closed loop pumped storage, (2) creating little to no change to existing ground and surface water uses and flows, (3) being unlikely to adversely affect threatened or endangered species, (4) obtaining a letter from a dam owner that the project is feasible if the project is located at or uses a federal dam, and (5) obtaining an approval letter from the managing entity of a public park, recreation area, or wildlife development if the project would use any of those sites.

Pincus et al., *supra* note 64, at 173.

151. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at 8-9 (listing proposed pilot process applicants); *see also* Michael Harris, *FERC Offers Recommendations After Pilot Two-Year Hydropower Plant Licensing Program*, HYDROWORLD (June 6, 2017), http://www.hydroworld.com/articles/2017/06/ferc-offers-recommendations-after-pilot-two-year-hydropower-plant-licensing-program.html [https://perma.cc/7C9L-FYWV] [hereinafter *FERC Offers Recommendations*] (discussing two-year pilot process applications).

152. *See FERC Offers Recommendations*, *supra* note 151 (describing two facilities involved in application for pilot program); *FERC Issues Hydroelectric License Under New Process*, POWER ENGINEERING (May 11,

Rye proposed to install a 275-foot-long concrete intake channel, and all the associated turbines and power lines, on a NPD.[153] In May 2016, FERC issued an original license to Rye under the two-year pilot process.[154] Rye commented that it recognized shorter timelines and more efficient communication with FERC staff throughout the process.[155] Rye also commented that this may have been because their project received great attention from Capitol Hill.[156]

Stakeholders and other parties interested in the possibility of a two-year licensing process also commented on the pilot process.[157] In general, the commenters agreed that a two-year licensing process may be feasible for certain types of projects.[158] Commenters also stressed the importance of ways out of the two-year licensing process if, for unforeseen reasons, the project encounters obstacles that make licensing in two years impossible.[159] Commenters disagreed over the likelihood of successfully implementing the two-year licensing process on the national scale.[160]

Based on the experience of licensing Rye's facility and the commenting periods, FERC reached several conclusions regarding the viability of a two-year licensing process.[161] Essentially, FERC concluded that an expedited two-year licensing process is possible under the existing regulatory scheme.[162] FERC also

2016), http://www.power-eng.com/articles/2016/05/ferc-issues-hydroelectric-license-under-new-process.html [https://perma.cc/5VWK-RJN6] (asserting Rye only project picked). FERC excluded Wildflower LLC. STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at 10 (discussing Wildflower LLC proposal inefficiencies). The principal reason Wildflower LLC did not meet the criteria is that it did not submit a sufficiently detailed proposal. *See id*. Rye commented that the criteria to enter the pilot process was "rather restrictive." *See* Michael Harris, *Rye Development Discusses FERC's Two-year Pilot Program*, HYDRO REVIEW (July 1, 2016), http://www.hydroworld.com/articles/hr/print/volume-35/issue-6/articles/rye-development-discusses-ferc-s-two-year-pilot-program.html [https://perma.cc/L5DZ-DS28] [hereinafter *Rye Development*] (discussing Rye's perspective on pilot process).

153. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at 11 (discussing physical makeup of pilot project). The project will operate as a run-of-river facility and will not affect the preexisting upstream reservoir. *See id*.; *see also supra* notes 28-30 and accompanying text (explaining run-of-river facility).

154. *See* Pincus et al., *supra* note 64, at 172 (discussing Rye's successful licensing). FERC only issued one license under the pilot process. *See id* at 172-73. Rye received the license exactly two years after filing. *See FERC Offers Recommendations*, *supra* note 151.

155. *See Rye Development*, *supra* note 152 (discussing result of pilot process).

156. *See id*. (exploring reasons pilot program successful).

157. *See* Warren, *supra* note 11, at 263 (discussing HREA mandated commenting process).

158. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at 25 (discussing public comments). Unfortunately, there is no consensus on what type or class of projects could be expedited. *See id.* Commenters agreed that drawing conclusions from a single test is difficult. *See id.*

159. *See id.* An example of an unforeseen obstacle is encountering an issue that requires NEPA scoping for more than one season. *See id*. at 25-26.

160. *See id.* at 29-31 (discussing different licensing methods benefits). Some commenters feel the existing framework is sufficient to license NPDs in approximately two years, while others think a new type of license should be created. *See id.* at 29-30. Rye proposed a new licensing process called the Existing Dam Process. *See id*. at 29. Commenters also expressed a feeling that it would be difficult for multiple projects to be put through the two-year process in the same state at the same time. *See id*.

161. *See id*. at 46-48 (stating conclusions).

162. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at 46 (explaining conclusions). FERC concluded that expedited licensing is possible under the TLP or small hydropower exemption processes

asserted that certain types of projects with certain characteristics are more suitable for licensing within two years.[163] The only part of the inefficient licensing process FERC accepted blame for was their outdated website, which is meant to provide information to developers considering small hydropower projects.[164]

FERC's overall conclusion was that Congress did not need to make statutory changes because two-year licensing is possible within the existing scheme.[165] This conclusion is interesting, considering FERC previously stated the opposite—that "[t]he most effective way to reduce cost and time of obtaining a hydropower license would be for Congress to make legislative changes."[166] FERC concluded that two-year licensing is possible within the existing scheme and then in the same paragraph essentially punted, explaining that two-year licensing may not be feasible because of statutory authority granted to other agencies.[167] DOE's August recommendation, that FERC revisit the licensing process to reduce regulatory burden, is proof that FERC's conclusion is inadequate.[168]

III. ANALYSIS

A. The HREA's Real Effect

As previously discussed, no single regulation or entity alone causes inefficient hydropower licensing.[169] Other small renewable projects do not face the same regulatory web, despite being less reliable sources of energy, because they are not subject to FERC proceedings.[170] If other small renewable projects can go

without modification to the normal processes, and under the ILP with regulation waivers or agreement by all the stakeholders. *See id.*

163. *See id.* at 46-47 (listing favorable characteristics). Rye commented on the criteria mentioning that it is restrictive to the point it would likely "render an expedited licensing process meaningless." *See Rye Development*, *supra* note 152 (suggesting criteria suitable for pilot program, and not regular process).

164. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at iii, 48 (mentioning online resources outdated). FERC has since updated their website. *See, e.g.*, *Small/Low-Impact Hydropower Projects: Do I need a Preliminary FERC Dam Safety Review?*, FED. ENERGY REG. COMMISSION (Jan 9, 2018), https://www.ferc.gov/industries/hydropower/gen-info/licensing/small-low-impact/get-started/dam-safety.asp [https://perma.cc/Y996-GAFN] (outlining feasible sites for two-year licensing); *Small/Low-Impact Hydropower Projects: Information About Projects Nearby*, FED. ENERGY REG. COMMISSION (July 12, 2017), https://www.ferc.gov/industries/hydropower/gen-info/licensing/small-low-impact/get-started/projects-nearby.asp [https://perma.cc/TWT6-65NB] (providing tools to find nearby projects); *Small/Low-Impact Hydropower Projects: Do I Need Approval From FERC?*, *supra* note 80 (explaining use of website with easily accessible information).

165. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at 48 (explaining FERC conclusions).

166. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 120, at 6 (discussing expediting licensing process).

167. *See id.* (asserting problem with licensing does not stem from FERC).

168. *See* U.S. DEP'T. OF ENERGY, *supra* note 2, at 127 (explaining DOE recommendations).

169. *See supra* note 5 and accompanying text (explaining different problems with regulatory system).

170. *See* Hansen et al., *supra* note 5, at 2 (discussing implications of FERC involvement in renewable project licensing); Kosnik, *supra* note 8, at 3252 (comparing efficiency of different renewable energy sources). Examples of other small renewable projects are rooftop solar and private wind turbines. *See* Hansen et al., *supra* note 5, at 2.

from initial planning to full construction in less than two years, the inefficiency of hydropower licensing must lay in the FERC licensing process.[171]

HREA was a novel attempt at reforming and expediting small hydropower licensing, but it did not yield any tangible results with regard to expediting licensing.[172] Congress asked FERC to look into a pilot two-year licensing process without requiring a result.[173] Only one facility qualified and participated in FERC's pilot process.[174] The developers of that facility commented that they believe the process worked because of the extra attention it received and that the process may not be feasible on a national scale.[175] All commenters on the two-year pilot process agreed that preemptive and frequent consultation with state and federal agencies is the key to successfully expedited licensing.[176] Nevertheless, the pilot program failed to demonstrate that state and federal agencies could adequately handle multiple two-year licensing applications.[177] The mandated pilot two-year licensing process did not result in a concrete response or proposal from FERC or any of the stakeholders but, rather, concluded with a vast array of differing opinions regarding the feasibility of two-year licensing.[178]

Changes to the small hydropower licensing process must go beyond increasing the size of eligible small hydropower exemption facilities.[179] As previously discussed, the exemption process is not an exemption from licensing because the applicant still has to go through the same licensing steps as the TLP.[180] The effect of the megawatt increase for exemption qualification is an increase in the amount of facilities eligible for the exemption process as opposed to expedited

171. *See Rye Development*, *supra* note 152 (asserting regulatory timeframes create problems with hydropower licensing). *But see* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at 48 (asserting other elements cause long licensing periods).

172. *See supra* Section II.E.2 (summarizing two-year licensing process comments and results).

173. *See* Hydropower Regulatory Efficiency Act of 2013, Pub. L. No. 113-23, § 6, 127 Stat. 493, 495 (providing study parameters); Warren, *supra* note 11, at 262-63 (explaining FERC responsibility to "explore" two-year licensing). The Act only instructs FERC to "*investigate* the feasibility of issuance of a license for hydropower development . . . projects in a 2-year period." Hydropower Regulatory Efficiency Act § 6(a) (emphasis added).

174. *See FERC Offers Recommendations*, *supra* note 151 (explaining FERC feedback on two-year licensing pilot). FERC expanded its sample size after Wild Flower Water LLC did not meet the testing criteria. *Id.*

175. *See supra* notes 155-156, 160 and accompanying text (summarizing Rye and general feedback on pilot two-year licensing process).

176. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at 28 (deeming initial consultation paramount to expedited licensing).

177. *See id*. at 29 (highlighting concerns with, and suggestions for, further use of two-year licensing).

178. *See generally id.* (summarizing propositions and conclusions regarding feasibility of two-year licensing).

179. Hydropower Regulatory Efficiency Act of 2013, Pub. L. No. 113-23, § 3, 127 Stat. 493, 493 (changing small hydropower exemption from five to ten megawatts).

180. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at 4 (stating qualifying exemption projects must use TLP); *supra* notes 120-122 and accompanying text (summarizing TLP); *see also supra* notes 126-127, 129-130 and accompanying text (explaining term "exemption" misleading). The exemption process can cost just as much as the other licensing processes and requires the same amount of consultation and paperwork. *See* Warren, *supra* note 19, at 962 (asserting exemption just as burdensome as other licensing).

licensing for those already eligible.[181] Commenters on the pilot two-year licensing process expressed concern about expedited licensing on a national scale because of limited resources.[182] Through expanding the number of facilities eligible for exemption, Congress may have hindered the possibility of expedited licensing by opening the door for additional eligible facilities to usurp the already thin state and federal agency resources.[183]

B. Potential Steps Forward

Even though no single piece of legislation could address every aspect of the complex small hydropower regulation process, it is imperative that Congress attempts to expedite the hydropower licensing process.[184] The debate between environmental interests and hydropower interests controls the discussion regarding the removal of hydropower licensing regulations.[185] Therefore, Congress should reform the small hydropower exemption with a focus on expediting the powering of NPDs, which would satisfy both parties.[186]

One way to begin expediting that process would be to eliminate the perpetual license granted by a small hydropower exemption.[187] Currently, a hydropower project going through one of the normal licensing processes is granted a thirty- to fifty-year license, but a facility granted an exemption receives a license in perpetuity.[188] Historically, licenses were granted for long periods of time to allow the developer time to recoup investment and make a profit on the project.[189] Small hydropower projects intending to power an NPD do not need a long period of time to recoup investment and make profit because powering an NPD is much cheaper than creating a whole new dam and power facility.[190] Developers would

181. *See* 16 U.S.C. § 2705(d) (2018) (codifying change of small hydropower exemption from five to ten megawatts).

182. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at ii, 29-30 (expressing concern regarding resources available for frequent consultation with multiple projects).

183. *See* 16 U.S.C. § 2705(d) (expanding exemption size); STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at 29-30 (highlighting concerns over potential lack of agency resources if multiple projects at once).

184. *See supra* note 108 and accompanying text (mentioning no single regulation to blame for licensing inefficiency).

185. *See* Kosnik, *supra* note 61, at 455 (characterizing licensing debate).

186. *See supra* note 48 and accompanying text (explaining powering NPDs has minimal impact because no new dam); *see also* Abassi & Abassi, *supra* note 43, at 2139 (elaborating on initial impacts of dam construction). Construction of the initial dam for a hydropower project is what causes the most damage to the environment. *See* Abassi & Abassi, *supra* note 43, at 2139.

187. *See* Warren, *supra* note 19, at 961 (indicating perpetual license harmful).

188. *See id.* at 960 (discussing licenses in perpetuity); *see also supra* Section II.C (explaining licensing processes).

189. *See* Warren, *supra* note 19, at 960 (asserting historical reasons for long licensing periods).

190. *See* U.S. DEP'T OF ENERGY, *supra* note 5, at 57 (mentioning powering NPDs excludes costs and impacts of dam construction); Petz, *supra* note 48 (stating low costs of powering NPDs attractive). Because the dam has already been built, the overall construction cost is marginal compared to projects that must create new dams. *See*

likely favor removing the perpetual license if it allowed the original licensing process to be completed in a more efficient manner.[191] Environmental advocates would also likely applaud removing the perpetual license because it would allow the facility to be reevaluated when the license is near expiring, which would allow any possible environmental impacts to be assessed and remediated.[192] While removing the perpetual license is only a small part of the regulatory burden small hydropower faces, if the legislation is written correctly, it has a high likelihood of being passed as it is seemingly something that both environmentalists and developers would agree with.[193]

Another small fix to a big problem would be to remove NPDs from regulation under the NHPA.[194] As previously discussed, many NPDs are relatively older structures that fall under the definition of historic property in the NHPA.[195] It is unlikely that Congress had small dams in mind, and Congress almost certainly did not mean to impede small hydropower development, when passing the NHPA.[196] To remedy the inefficiencies created by the NHPA, Congress would likely have to add language to § 306108 excepting dams where developers propose installing hydropower facilities under ten megawatts and using the licensing exemption.[197]

Moreover, Congress could continue the progress by building on the information gained during the two-year pilot program.[198] Congress could create a more comprehensive solution by mandating a study of small hydropower that builds off of the information gained during the original two-year pilot process,

HADJERIOUA ET AL., *supra* note 19, at vii (estimating overall cost of powering NPDs significantly lower than creating new dam); Cumming, *supra* note 10, at 920-21 (summarizing Oak Ridge report).

191. *See supra* note 5 and accompanying text (listing sources stating developers discouraged from development by long regulatory periods). The regulatory process, even for simple projects, is quite complicated, but with fewer complications small hydropower could see the same growth as other renewable energy sources. *See* Hansen et al., *supra* note 5, at 2-3 (discussing complex regulatory scheme).

192. *See* Warren, *supra* note 19, at 961 (indicating removal of perpetual license beneficial). Removing the perpetual license would also incentivize developers to ensure environmental compliance rather than compromise relicensing opportunity. *Id.*

193. *See* Kosnik, *supra* note 61, at 455 (characterizing licensing debate as environmentalists against developers).

194. National Historic Preservation Act § 3, 54 U.S.C. § 306108 (2018) (precluding federal licensing until historic property evaluated).

195. *See supra* notes 102-103 and accompanying text (discussing NPD inclusion in NHPA).

196. *See* 54 U.S.C § 300308 (defining protected historic property). The NHPA defines "historic property" to mean "any prehistoric or historic district, site, building, structure, or object included on, or eligible for inclusion on, the National Register, including artifacts, records, and material remains relating to the district, site, building, structure, or object." *Id.*

197. *Id.* § 306108.

198. *See supra* text accompanying notes 187, 194 (proposing two small fixes to burdensome hydropower regulatory scheme).

and then incorporate the new study's results into a revised two-year pilot process.[199] Instead of focusing on two-year licensing and the hydropower industry as a whole, the potential new study should focus exclusively on creating a criteria for NPDs capable of receiving small hydropower facilities under ten megawatts and thus being licensed in an expedited manner.[200]

FERC's report on the two-year pilot process includes both FERC's and commenters' input on feasible contenders for two-year licensing processes.[201] The new study should begin by consolidating all comments and feedback on the two-year licensing process.[202] FERC should then create what it believes is a feasible list of necessary features for expedited licensing of projects proposing to power NPDs with less than ten megawatts.[203] After creating the list, FERC should release it and negotiate with all commenters and stakeholders to create a mutually agreeable list of key features.[204] When this process is complete, FERC should publish the final list of features and solicit pilot projects, just as it did for the original two-year pilot process, but focus on projects proposing to install facilities that would produce ten megawatts or fewer on NPDs.[205] FERC should allow more projects to enter this trial in order to determine if expedited licensing for this specific type of project is possible on a national scale and with multiple projects being licensed in the same areas.[206]

After completion of the new pilot process, FERC and those involved should reassess the list of features and seek to reform the small hydropower exemption

199. *See generally* Hydropower Regulatory Efficiency Act of 2013, Pub. L. No. 113-23, 127 Stat. 493 (2013) (mandating FERC two-year pilot project); STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89 (assessing end result of two-year pilot process and including recommendations from interested parties); HADJERIOUA ET AL., *supra* note 19 (assessing small hydropower potential in 2012); U.S. DEP'T OF ENERGY, *supra* note 5 (assessing potential of all hydropower in United States); *Rye Development*, *supra* note 152 (discussing two-year pilot facilities feedback concerning feasibility of expedited licensing).

200. *See generally* HADJERIOUA ET AL., *supra* note 19 (assessing small hydropower potential in 2012); U.S. DEP'T OF ENERGY, *supra* note 5 (assessing potential of all U.S. hydropower).

201. STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at 26, 37-38 (discussing optimal design criteria for expedited licensing sites). As previously mentioned, the facility that went through the two-year pilot explained that FERC's initial criteria for entering the process was rather restrictive. *Rye Development*, *supra* note 152 (discussing Rye's view of two-year pilot process).

202. *See generally* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89 (discussing results of two-year pilot process).

203. *See generally id.*

204. *See Rye Development*, *supra* note 152 (mentioning some disparity between what FERC wanted and actual experience). The list of key features for expedited licensing should not be as restrictive as the factors determining eligibility for the two-year pilot process. *See id.* Rye commented that it was not surprising that few projects submitted proposals for the two-year pilot because of the restrictive criteria. *See id.*

205. *See* Bose, *supra* note 149, at 1 (soliciting projects for two-year pilot process).

206. *See* STAFF OF FED. ENERGY REGULATORY COMM'N, *supra* note 89, at 29 (expressing concerns over processing multiple expedited projects on national scale). Commenters also expressed that it is difficult to draw conclusions based off of a single test case. *Id.* at 25.

around them.[207] Contrary to FERC's belief, expediting small hydropower licensing will involve statutory changes to the FPA.[208] Although this proposal might seem far-fetched, expediting hydropower licensing has bipartisan support and changes to the FPA are also likely to receive bipartisan support, as seen by the unanimous vote for the HREA.[209]

IV. CONCLUSION

As the United States addresses the omnipresent threat of global climate change, the nature of the U.S. electricity grid is slowly changing. The sustainable sources of energy being added to the grid are challenging the assumptions the United States set up its grid management practices on. Adding hydropower capacity will enable the United States to add other forms of renewable energy to the grid without its balance. DOE's recent report deemed grid resiliency and reliability as two important factors in securing the nation's energy future. Hydropower produces affordable baseload generation that contributes to a reliable and resilient power grid, but conventional large-scale sites are virtually unavailable. Therefore, the utilization of NPDs to create small hydropower facilities is necessary to add hydropower to the energy grid.

Efficiently utilizing the thousands of small NPDs throughout the United States is nearly impossible with the current regulatory scheme. FERC, DOE, Congress, and many others have tried to alleviate the burden of the regulatory system in a variety of ways. As the principal agency governing hydropower licensing, FERC has flipped between recommending statutory change and explicitly stating that no change is needed to expedite small hydropower licensing. The recent DOE report, recommending FERC revisit the regulatory scheme, indicates that the licensing problem has not been fixed.

It is time for statutory change. Congress can begin expediting small hydropower development by eliminating perpetual licensing and amending the NHPA. Congress can provide a more concrete resolution through mandating a more pointed study of small hydropower potential and then reforming the FPA to expedite small hydropower licensing.

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207. *See* 16 U.S.C. § 2705(d) (2018) (codifying exemptions). Reforming the small hydropower exemption will be possible because the new pilot process will target facilities using NPDs and producing less than ten megawatts. *See id.* (stating exemption parameters); *supra* text accompanying note 205 (proposing study focus on powering small NPDs).

208. *See* 16 U.S.C. § 2705(d) (codifying exemption and referencing other statutes involved in exemption).

209. *See supra* note 141 (mentioning unanimous support for HREA); *see also Bill Could Reauthorize EPAct*, *supra* note 141 (identifying other recent hydropower related bills). The original pilot process received lots of attention from the Hill because of Congress's vested interest in securing the energy grid. *See Rye Development*, *supra* note 152 (discussing factors related to original two-year pilot process).