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Environmental Protection Agency
EPA Docket Center Room 3334
EPA WJC West Building
1301 Constitution Avenue, NW
Washington, DC 20460

Re: National Hydropower Association Comments on Clean Power Plan; Docket ID No. EPA-HQ-OAR-2013-0602

The National Hydropower Association (NHA)[1] submits the following comments on the Environmental Protection Agency's (EPA or Agency) June 2, 2014 proposed performance standards for reducing carbon dioxide (CO2) emissions from existing power plants under the Clean Air Act Section 111(d).

NHA appreciates the public outreach EPA has conducted in the development of the proposed rule and the opportunity to comment in writing.

The Clean Power Plan is a complex rulemaking that has differing impacts on asset owners depending on the make-up of their portfolio, the state(s) in which they are located, and the segment of the power sector they represent (investor owned utilities (IOUs), municipalities, independent power producers (IPPs)). As such, these comments are solely NHA's and the Association directs you to the individual submissions of our member companies for a fuller view of the issues and impacts of the proposed rule on industry members.

NHA believes that hydroelectric power generation resources have played and will continue to play a critical and indispensible role in meeting carbon reduction goals – a role also recognized by the President and the administration as evidenced by hydropower's inclusion in his 2013 Climate Action Plan.[2]

[1] NHA is the national non-profit association dedicated exclusively to advancing the interests of the hydropower industry, including conventional, pumped storage, conduit power and new marine and hydrokinetic technologies. NHA's membership consists of more than 190 organizations, including consumer-owned utilities, investor-owned utilities, independent power producers, project developers, equipment manufacturers, environmental and engineering consultants, and attorneys.

[2] "The Administration is also taking steps to encourage the development of hydroelectric power at existing dams. To develop and demonstrate improved permitting procedures for such projects, the Administration will designate the Red Rock Hydroelectric Plant on the Des Moines River in Iowa to participate in its Infrastructure Permitting Dashboard for high-priority projects." The President's Climate Action Plan, P.7. http://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf.

Hydropower, with its zero-emitting profile, along with its ability to provide both base load power and other ancillary grid services, will serve as a foundation for meeting the goals set under the proposed rule.

NHA's comments below contain: a table of contents; executive summary; a background discussion on the role of hydropower in the nation's electricity portfolio and future growth potential opportunities; specific comments on the treatment of hydropower resources for compliance; further compliance issues, and several important other issues including the role of the federal system, hydropower pumped storage projects, and marine and hydrokinetic (MHK) technologies.

NHA's comments will be limited to the recognition of and impact on hydropower resources under the proposal. Again, many of our member company utilities, particularly those with mixed generation portfolios, have identified other issues and areas of concern. NHA directs you to their comment submissions for a discussion of those broader issues.

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II. Executive Summary

- NHA's vision is to double the contribution of hydropower to help achieve a sustainable and secure clean energy future and drive economic development. In support of this vision, NHA has partnered with the Department of Energy on its Hydropower Vision initiative. Launching the initiative at NHA's Annual Conference in April, Secretary Ernst Moniz stated, *"We have to pick up the covers off of this hidden renewable that's right in front of our eyes and continues to have significant potential."*

- NHA's mission includes championing hydropower as America's premier carbon-free renewable energy resource, with a focus on industry growth, operational excellence, streamlined licensing, environmental stewardship, and improved market recognition for hydropower's benefits.

- In furtherance of its vision and mission, NHA supports federal policies that promote and provide value to hydropower resources.

- The Clean Power Plan, similar to other federal policies supported by NHA (i.e. renewable energy tax incentives and bond programs, renewable energy/clean energy standards (RES/CES) and others) is another mechanism, which, if properly implemented, should provide new market and policy opportunities that promote and preserve existing hydropower assets as well as new hydropower development.

- **NHA believes the hydropower resource has a critical role to play in meeting the goals and objectives of the Clean Power Plan and to further reduce the carbon intensity of the U.S. electric power sector. Hydropower's ability to provide flexible base load power to follow load, to integrate additional intermittent renewable resources, and to allow both fossil and nuclear units to run at peak efficiencies will be in even greater demand under the Plan.**

- However, the proposed rule does not fully value hydropower's contributions in reducing past and future levels of carbon emissions from the nation's electric system or the ancillary grid benefits the resource provides.

- By utilizing a fossil emissions rate as its starting baseline for setting the state emissions rate reduction goals, the proposed rule artificially inflates the carbon profile of states with significant existing hydropower generation. Instead of recognizing and valuing the positive contributions hydropower generation makes, the proposed rule does exactly the opposite.

- In order to maximize the amount of greenhouse gas emissions reductions, the EPA will need to treat hydropower equitably under the proposed rule, particularly in comparison to the treatment of other renewable and clean energy resources. The agency should amend the proposal to adopt hydropower-specific considerations and provisions to better account for and accommodate hydropower resources, such as: allowing states to utilize generation from hydropower assets as a compliance option, even if that generation is not used in establishing state goals; utilizing an averaging of years to set the baseline (as opposed to the single year of 2012); as well as a rolling compliance average or water availability compliance "safety valve".

- Numerous administration and other analyses demonstrate that hydropower has significant new growth potential including: capacity additions and efficiency improvements at existing facilities; adding generation to non-powered dams; pumped storage, conduit, marine and hydrokinetic (MHK) projects; as well as new infrastructure projects. The EPA should provide more definitive and clear direction to the states that the Agency supports new hydropower generation as a compliance option under the rule and that states are encouraged to examine ways to incorporate new hydropower generation into their planning.

- The EPA should conduct further analysis and clarify outstanding issues not considered by the rule. These include: the hydropower growth assumptions and scenarios in the modeling that are in conflict with other federal and private projections; the accounting of the federal hydropower system; and the utilization of other resources that do not appear to be contemplated under the rule, particularly pumped storage and marine and hydrokinetic technologies.

- NHA also highlights that the federal government itself has a major role in determining whether the Clean Power Plan targets are successfully met with multiple agencies, including EPA itself, having a role in permitting and licensing of clean energy projects. To illustrate, in a recent order, FERC stated that of the 43 pending license applications for which FERC staff has completed environmental analysis, 29 (67 percent) are awaiting state water quality certifications, a permitting function under Section 401 of the Clean Water Act delegated to the states by the EPA.

- Finally, NHA commits to working cooperatively with the EPA to improve the Clean Power Plan and appropriately recognize and account for the carbon reduction and the grid reliability benefits hydropower resources provide and to working with the states in the coming years on their plans.

III. Background on Hydropower and Growth Potential

Since the late 1800s, hydropower has been and remains the major source of clean, renewable, emissions-free electricity generation in the United States.

Currently, at approximately 7 percent of total electricity generation, hydropower is the second-largest source of non-fossil-fuel power in the country. Hydropower also has a large installed capacity base of 79 GW of conventional hydropower projects, or 101 GW, including 22 GW of pumped storage projects.[3]

In 2014, hydropower is the single largest source of renewable electricity, providing about half of all generation from these resources. [4]

While many may assume that hydropower is mainly a Pacific Northwest energy resource, in fact hydropower is utilized and available across the country, powering homes and businesses in every state. There are over 2200 federal and non-federal hydropower projects in service in the U.S.[5] These projects are providing low-cost emissions-free power to consumers in every one of the 50 states.

In fact, the top 10 producing hydropower states in 2012 were:

1. Washington
2. Oregon
3. California
4. New York
5. Montana
6. Idaho
7. Tennessee
8. Alabama
9. Arizona
10. South Dakota

The importance of hydropower and its clean air benefits to individual states as well as looking forward to compliance under the Clean Power Plan can be summarized with one fact. In 2012, the use of hydropower avoided over 190 million metric tons of CO2. This is the equivalent of avoiding the CO2 emissions from 40 million cars.[6]

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[3] 2014 Sustainable Energy in America Factbook, Bloomberg New Energy Finance and Business Council for Sustainable Energy, P. 50.
http://www.bcse.org/factbook/pdfs/2014%20Sustainable%20Energy%20in%20America%20Factbook.pdf#page=60

[4] Energy Information Administration Electric Power Monthly
See: http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_1_1

[5] National Hydropower Map, Department of Energy, Office of Energy Efficiency and Renewable Energy and Oak Ridge National Laboratory. http://nhaap.ornl.gov/sites/default/files/National_Hydro_Map20130815.pdf

[6] EIA 2012 generation data, http://www.eia.gov/electricity/annual/ ;
EPA Greenhouse Gas Equivalencies Calculator: http://www.epa.gov/cleanenergy/energy-resources/calculator.html

NHA also highlights that the U.N. Intergovernmental Panel on Climate Change (IPCC) itself has stated that "[h]ydropower offers a significant potential for near- and long-term carbon emissions reduction."[7]

A. Existing Non-powered Dams and Conduits

Though hydropower has been a major existing source of renewable power for over a century, it is a resource with untapped growth potential – new projects that can add to the already sizable contribution hydropower makes to the country's clean electricity profile.

One such growth area is on existing dams and conduits. The vast majority of U.S. dams were constructed for purposes other than hydropower generation. These dams include structures and impoundments that provide opportunities to install hydropower generation compatible with the original purposes for which they were built, such as:

- Domestic water supply;
- Flood control;
- Irrigation;
- Navigation; and
- Recreation.

NHA estimates that only about 3 percent of the nation's approximately 80,000 existing dams are equipped with generation facilities. This presents an opportunity to maximize the public benefits of these non-powered dams and related infrastructure through retrofits to produce electricity.

In April 2012, the Department of Energy concluded a review of the nation's non-powered dams and estimated that an **additional 12 GW** of capacity were available for use.[8] The top ten sites identified in the report alone have the potential to provide approximately 3 GW, with the top 100 sites able to provide up to 8 GW. Of the top 100 sites, 81 are located on U.S. Army Corps of Engineers' dams.

With the dam infrastructure already in place, these sites are some of the most cost-effective new development options in the hydropower industry. These 12 GW alone, many of which are located in the Southeast and eastern Midwest states, could displace the need for fossil–based generation.

Commenting on the report, then Secretary of Energy Steven Chu stated, "As part of the Obama Administration's all-of-the-above approach to American energy, expanding the deployment of America's hydropower resources can help to diversify our energy mix, create jobs and reduce carbon pollution nationwide. Together with new advances and innovations in hydropower technologies, the resource assessment released today can help use our existing infrastructure to further develop the country's significant waterway resources."

[7] Special Report on Renewable Energy Sources and Climate Change Mitigation (SRREN), IPPC, 2012, P.86, http://srren.ipcc-wg3.de/report/IPCC_SRREN_Full_Report.pdf

[8] An Assessment of Energy Potential at Non-powered Dams in the United States, Executive Summary P. vii. http://www1.eere.energy.gov/water/pdfs/npd_report.pdf

One example of a utility implementing this type of development is AMP, a group of municipally owned electric systems in 7 Midwest and Mid-Atlantic states. AMP is developing four new hydroelectric projects that will add more than 300 MW of new, renewable generation to the region. These run-of-the-river hydroelectric facilities will be installed on existing dams on the Ohio River. They are currently under construction and will be coming online in the next two years.

NHA also notes that with the passage of the Hydropower Regulatory Efficiency Act (HREA) (Pub. L. No. 113-23) and the Bureau of Reclamation Small Hydropower and Rural Jobs Act (Pub. L. No. 113-24) in 2013 that conduit hydropower development has seen an increase. For example, since enactment of HREA, over 2 dozen qualifying small conduit projects have been approved at the Federal Energy Regulatory Commission (FERC). At the Bureau of Reclamation, also since 2013, another 9 Lease of Power Privilege (LOPP) projects are underway.

As part of HREA, the Department of Energy was required to issue a report to Congress on deployment opportunities in this sector. That report is not yet public, but is expected to be issued soon.

B. New Stream-reach Development

This year, the Department of Energy also released a new stream-reach development resource assessment that evaluated project potential for new hydropower development in U.S. stream segments that do not currently have hydroelectric facilities.[9] The report found that 65.5 GW of potential hydropower generation exists in rivers and streams throughout the country, excluding locations where such new development is prohibited, such as National Parks, Wild and Scenic Rivers and Wilderness Areas.[10]

NHA recognizes that not all of these projects may be built and that comprehensive engineering, environmental and economic studies, including required environmental assessments (EAs) or environmental impact statements (EIS) would need to be conducted on any individual site. However, the potential remains substantial, particularly with the application of new technologies and advanced management practices.

C. Expanding Existing Hydropower Facilities

One other important area of new hydropower growth is adding capacity or improving efficiency at existing hydropower facilities. A 2009 analysis by Navigant Consulting, commissioned by NHA, found that there was approximately 9 GW of additional capacity available to develop.[11] These improvements are often the most cost-effective and least natural resource impactful projects. They often involve

[9] New Stream-reach Development: A Comprehensive Assessment of Hydropower Energy Potential in the United States. Department of Energy, Office of Energy Efficiency and Renewable Energy and Oak Ridge National Laboratory. http://nhaap.ornl.gov/sites/default/files/ORNL_NSD_FY14_Final_Report.pdf

[10] Ibid. Executive Summary P. i.

[11] Job Creation Opportunities in Hydropower, Navigant Consulting, 2009. http://www.hydro.org/wp-content/uploads/2010/12/NHA_JobsStudy_FinalReport.pdf

adding additional powerhouses to a project or even just upgrading existing equipment to state-of-the-art new technology.

A recent example of such a project includes the 2013 expansion project by PPL at its Holtwood hydroelectric facility. This approximately $440 million expansion of the Holtwood plant on the Susquehanna River about 15 miles south of Lancaster, PA, included construction of a second powerhouse that added enough renewable energy to power about 100,000 homes.

The 125 MW increase in generating capacity will more than double Holtwood's existing generating capacity of 108 MW. In addition, the project improves passage for migratory fish along the Susquehanna River and its tributaries and enhances recreational opportunities.[12]

D. Pumped Storage and Marine and Hydrokinetic (MHK) Projects

Hydropower pumped storage is a proven technology and is the largest energy storage resource in the U.S. and globally. MHK technologies are a new class of renewable energy projects at the cusp of commercialization both in the U.S. and abroad. For each, there is significant growth potential, for which the Clean Power Plan should provide support for future deployment.

These resources can supply dispatchable clean energy generation. And pumped storage, in particular, provides many ancillary grid services. All of which will be necessary to meet the Plan's carbon emissions reduction objectives and goals. As such, NHA believes additional discussion is warranted under the rule to ensure a strong policy signal is sent confirming the utilization of these resources as compliance options as states begin their planning.

NHA notes once again that as part of HREA, the Department of Energy was also required to issue a pumped storage report to Congress. That report is not yet public, but is expected to be issued soon.

More detailed information on pumped storage and MHK resources can be found in sections located at the end of these comments.

IV. National Benefits of Hydropower Use

A. Affordability

Hydropower generation benefits consumers through lower electricity costs. States where the majority of their electricity generation is from hydropower like Idaho, Washington, and Oregon, on average, have energy bills that are lower than the rest of the country. [13]

In addition, once placed in service, hydropower projects are long-lived assets. There are examples of hydropower units today that have been in use since the late 1800s. These projects provide significant

[12] http://www.hydroworld.com/articles/2013/12/expansions-of-holtwood-hydropower-project-complete.html

[13] Energy Information Administration, 2012 Average Monthly Bill – Residential. http://www.eia.gov/electricity/sales_revenue_price/pdf/table5_a.pdf

economic benefits to ratepayers over their long lifespan. Once the initial capital investment is paid in full, the main future costs are associated with operations, maintenance and compliance. And of course, the fuel for these projects – water – is free.

B. Reliability

Hydropower generation provides an important source of base load power in the U.S. In addition, that base load generation, when combined with hydropower's unique operational attributes, also benefits the nation's electric grid as a whole.

Conventional hydropower facilities can quickly go from zero power to maximum output, making them exceptionally good at meeting rapidly changing demands for electricity throughout the day. This flexibility, along with the energy storage benefits provided by both conventional and hydropower pumped storage projects, are critical to integrating greater amounts of intermittent renewable energy sources like wind and solar into the grid.[14]

Specifically, hydropower pumped storage projects store energy in the form of water in an upper reservoir, pumped from a second reservoir at a lower elevation. During periods of high electricity demand, the stored water is released through turbines in the same manner as a conventional hydropower station. Excess energy from the grid recharges the reservoir by pumping the water back to the upper reservoir, usually during nights and weekends when electricity demand is low.

Pumped hydropower storage accounts for 98 percent of all energy storage in the United States.

These utility scale energy storage systems maximize the use of all generation resources. Not only do they assist in the integration of other renewables, they also allow fossil units to be run at their peak efficiency, which reduces their carbon emissions output. Pumped storage also helps prevent the need for cycling the nation's nuclear units. All of these services ensure a balanced load on the grid, which provides stability and reliability for all electricity consumers.

Finally, NHA notes that if these capabilities of the conventional hydropower and pumped storage system were to be limited or lost, the usual replacement is through fossil-based peaking assets, such as natural gas. Replacing carbon-free peaking generation with fossil peaking generation only serves to make the objectives of the Clean Power Plan more difficult to attain.

C. Sustainability

Hydropower taps into the natural water cycle, harnessing the power of moving water to produce renewable electricity.

[14] One example of the benefits of hydropower can be found in the September 2013 Midcontinent Independent System Operator (MISO) draft Wind Synergy Study. That particular study examined the benefits and cost savings associated with the use of Manitoba hydropower facilities with current and planned wind generation in the MISO footprint.

States that utilize more hydropower have the cleanest air and some of the lowest carbon intensity rates in the nation. For example, Washington state ranks number 10 in the nation in the amount of electricity generated. However, because the majority of that generation comes from hydropower, the state ranks 50th in carbon intensity with only 132 lbs of carbon dioxide produced per MWh.[15]

The hydropower industry invests considerable time, effort and financial resources to better understand its environmental impacts and mitigate them to the fullest extent. Through voluntary efforts, as well as license conditions governing project operations required by FERC and federal and state resource agencies as part of the hydropower licensing process, hydropower owners/operators implement site-specific comprehensive measures designed to protect the environment in which projects operate.

Measures to lessen the footprint of projects include:

- Reservoir sediment and river erosion management;
- Fish passage facilities construction and management;
- Modifying project operations to restore river flows;
- Fish hatchery construction and operation;
- Controlling the temperature and oxygen levels of water released from project facilities; and
- Conserving and remediating land surrounding reservoirs, rivers and project facilities.

Implementation of these measures is providing tangible results. Earlier this year, the National Oceanic and Atmospheric Administration (NOAA) announced that returns of Columbia River sockeye salmon have broken records, with numbers passing Bonneville Dam not seen since its completion in 1938. NOAA also noted that enough Snake River sockeye have reached Lower Granite Dam so far in 2014 to make it the third strongest return since 1975.[16]

Environmental partners with the hydropower industry have also noted the results, with American Rivers stating in 2013 that:

> "We expect that hydropower will continue to be a part of our nation's energy mix for years to come, and accordingly we have signed dozens of agreements supporting the operation of hydroelectric dams that together provide our nation with thousands of megawatts of generating capacity. Reasonable modifications have dramatically improved the performance of these dams, providing fish passage, improving flows, enhancing water quality, protecting riparian lands, and restoring recreational opportunities."[17]

D. Economic Opportunities and Jobs

The U.S. hydropower industry currently employs up to 300,000 workers, from project development to manufacturing to facilities operations and maintenance.[18] These include job opportunities in a variety of

[15] http://www.eia.gov/electricity/state/washington/

[16] http://www.westcoast.fisheries.noaa.gov/stories/2014/22_07252014_record_sockeye_returns.html

[17] Matthew Rice, Colorado Director, American Rivers Testimony to the House Energy and Commerce Committee. 2013.

[18] Job Creation Opportunities in Hydropower, Navigant Consulting, 2009.

fields including research and the sciences, regulatory and legal specialties, engineering and land management, as well as finance, marketing and management.

Also, more and more of America's top companies are moving their operations, building new facilities and creating jobs in areas close to hydropower resources – from data centers by Yahoo and Microsoft to manufacturing plants by BMW. The reasons for this trend are clear: renewable hydropower provides its customers one of the most affordable and reliable sources of electricity in America, while boosting corporate sustainability and certainty in a carbon-constrained world.

V. Treatment of Hydropower under the Proposed Rule

A. Setting the State Goals[19]

Under the proposed rule, EPA would set state-specific emissions goals for reducing carbon dioxide (CO2) emissions from the power sector. Each state would be required to meet its target by 2030 by lowering the carbon intensity of the power sector.

The formula proposed for the 2030 state goals is a rate: CO2 emissions from fossil fuel-fired power plants in pounds (lbs) divided by state electricity generation from fossil-fuel fired power plants and certain low- or zero-emitting power sources in megawatt hours (MWh).

The proposal establishes the Best System of Emissions Reduction (BSER) by factoring in megawatt-hours from fossil fuel power plants plus other types of power generation, like non-hydropower renewables and nuclear under construction and at-risk, as well as megawatt-hour savings from energy efficiency. This approach considers what are known as "outside the fence" technologies in setting state goals.[20]

State- and regional-specific information is plugged into the formula, and the result of the equation is the state-specific goal, due to the unique mix of emissions and power sources from each state that are inserted into the formula.

A two-part goal structure is proposed with an "interim goal" that a state must meet on average over the ten-year period from 2020-2029 and a "final goal" that a state must meet at the end of that period in 2030 and thereafter.

B. The proposed rule does not fully value hydropower's contributions in reducing past and future levels of carbon emissions from electric systems.

[19] FACT SHEET: Clean Power Plan Framework, EPA
http://www2.epa.gov/carbon-pollution-standards/fact-sheet-clean-power-plan-framework

[20] NHA's comments are offered within the rule framework as proposed. The association understands that individual member companies are filing comments on this approach and the underlying legal basis for it. NHA directs the EPA to those member comments for their analysis and opinion on that issue.

In developing what is known as BSER building block 3 (Build more low/zero carbon generation), the EPA excludes hydropower generation (existing, incremental or new) from the calculations that set the 2012 baselines for renewable energy generation and the 2030 rate reduction targets for each of the states.[21]

Importantly, in addition to excluding existing hydropower generation from the calculations, the proposed rule, and the EPA's underlying modeling, appears to presume zero future growth in hydropower generation – in direct contradiction to what is happening on the ground and the administration's own studies.[22]

As a result, the EPA proposal significantly undervalues the historic emissions reduction benefits hydropower has provided in its over 100 years of operation. The same is true for the emissions reduction benefits the existing system, along with incremental hydropower generation and generation from new hydropower assets, will provide in the future.

C. The proposed rule does not utilize a true carbon intensity calculation and artificially inflates the carbon profile of states, particularly hydro rich states.

The stated goal of the proposal is to "reduce the carbon intensity of the power sector." Yet an analysis of the Energy Information Administration's 2012 state profiles show that hydropower rich states already enjoy some of the lowest carbon intensive power generation systems in the country[23]:

- Washington – 132 lbs of CO2/ MWh
- Idaho – 166 lbs of CO2 /MWh
- Oregon – 266 lbs of CO2 per MWh

In fact, Washington ranked 50th in lbs of CO2 emissions per MWh in 2012. Idaho ranked 49th and Oregon ranked 48th. Yet, instead of seeing an advantage under the proposed rule for having the lowest carbon emissions rankings in the country, these states are being asked to do even more.

Notably, the EIA rates are calculated taking the total amount of carbon emissions in pounds divided by **total MWh, including hydropower MWhs** as opposed to the EPA's proposal that starts with a fossil emissions rate of **pounds of carbon emissions divided by fossil MWhs** and then applies the various building blocks (including the renewables MWhs) to this baseline to calculate the 2030 goals.

NHA also notes that not only are the rates in hydropower rich states the lowest in the country, they are currently well below even the 2030 target rates set by the proposed rule under its methodology.

[21] 79 Fed. Reg. at 34,867.

[22] See Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants, Table 3-11, P. 3-27 and EPA Technical Support Document TSD: GHG Abatement Measures, at 4-5.

[23] http://www.eia.gov/electricity/state/washington/index.cfm
http://www.eia.gov/electricity/state/idaho/index.cfm
http://www.eia.gov/electricity/state/oregon/index.cfm

NHA believes any carbon emissions reduction rule should recognize and value the positive contributions hydropower generation makes. **By utilizing a fossil emissions rate as its starting baseline, the proposed rule does exactly the opposite and artificially inflates the carbon profile of states with significant existing hydropower generation.**

To illustrate, NHA examined the EPA analysis for a hydro rich state (Washington) to a state with a more mixed electricity portfolio (Alabama). Under the 2012 fossil emissions rate calculation, the two states are almost equivalent (Washington at 1379 lbs/MWh; Alabama at 1518 lbs/MWh). Yet, in terms of actual emissions in 2012, Washington emitted less than one tenth the total amount of carbon.

Applying the current methodology under the proposed rule, Washington's 2030 goal is 215 lbs/MWH – a reduction of over 84 percent. Alabama's goal is 1059 lbs/MWh – a reduction of over 30 percent. If a true carbon intensity calculation was used (like that of the EIA), the 2012 starting baseline numbers would more accurately represent the true carbon profile of the states; account for and capture the benefits of hydropower; and be carried through the calculation for the 2030 goal. As a result, the 2030 percentage rate reductions would not be as severe.

As the rule is designed, the above example demonstrates in stark terms how hydropower's role in creating an almost carbon-free electricity system in hydro rich states in the West and Pacific Northwest is not accounted for.

As further examples, even states with a higher carbon emissions profile, but also with significant hydropower resources, have 2012 EIA carbon intensity rates that are below the 2030 targets[24]:

- Alabama – 994 lbs of CO2 per MWh
- Tennessee – 1181 lbs of CO2 per MWh
- Montana – 1268 lbs of CO2 per MWh

These numbers demonstrate hydropower's contribution in significantly displacing the need for carbon emitting resources in states outside of the West and Pacific Northwest, and how that benefit is not represented in the current proposal.

D. The proposed rule does not accurately characterize hydropower's future growth potential.

NHA believes the proposed rule relies on a faulty assumption that hydropower generation will remain flat through 2030.[25] To start, from 2009 through 2013, there has been 931 MW of new hydropower capacity commissioned in the United States from new projects (incremental, building on existing non-powered dams or those involving new infrastructure).

[24] http://www.eia.gov/electricity/state/alabama/index.cfm
http://www.eia.gov/electricity/state/tennessee/index.cfm
http://www.eia.gov/electricity/state/montana/index.cfm

[25] Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants, Table 3-11, P. 3-27.

In the same time period, the Federal Energy Regulatory Commission has issued authorizations (licenses or exemptions) for another 610 MW. Much of this development has been stimulated by federal tax incentives, some state renewable portfolio standards, or a combination of the two.

There are currently over 310 projects representing 43,000+ MW of new hydropower capacity under consideration for approval at the Federal Energy Regulatory Commission.[26] These include conventional hydropower, hydropower pumped storage, conduit as well as new marine and hydrokinetic (MHK) technologies.

- Issued Preliminary Permits: 233 projects with a capacity of 38,301.728 MW
- Pending Preliminary Permits: 22 projects with a capacity of 3,631 MW
- Pending Original Licenses and Exemptions: 55 Projects with a capacity of 1692.071 MW

The Clean Power Plan should provide a strong policy signal to support the deployment of these projects, which would result in a substantial increase in hydroelectric generation output. NHA believes the current proposal does not accomplish this.

NHA also recognizes that these projects are in the early phases of investigation and development, and not all will ultimately be commissioned due to possible economic, environmental or engineering factors. However, what these numbers show is a tremendous untapped hydropower resource that the rule should incentivize and for which the EPA should properly analyze under the modeling.

While the EPA did analyze and find some new hydropower potential, it is unclear whether the modeling took into account the recent FERC commissioning and licensing data cited above. Additionally, it is not clear to what extent the technical resource potential studies cited earlier factored into the analysis.

V. Recommendations and Policy Options

The Clean Power Plan may serve as the foundation for U.S. climate/carbon emissions policy in the power sector for the foreseeable future. NHA anticipates and expects that many further subsequent policies, at both the federal and state level, will be pursued in order to achieve the goals established under the Plan.

As such, it is vitally important that zero-emissions generation options, such as hydropower, are equitably recognized and valued under the proposed rule.

A. EPA should re-examine and improve its modeling of hydropower resources with the most current tools.

NHA believes the EPA first needs to re-evaluate its modeling and assumptions for hydropower underpinning the proposed rule, particularly its analysis of future new hydropower generation growth potential. New studies were released during and after the modeling that was conducted in support of the proposal.

[26] http://www.ferc.gov/industries/hydropower/gen-info/licensing/pre-permits.asp. NHA notes that FERC regularly updates these numbers throughout the year with the most recent information.

NHA highlights that the Department of Energy in April 2014 announced a new Hydropower Vision initiative that "will establish the analytical basis for an ambitious roadmap to usher in a new era of growth in sustainable domestic hydropower over the next half century."

Speaking of hydropower's role in the administration's all-of-the-above energy strategy at NHA's Annual Conference in April, Secretary Ernst Moniz stated, "We have to pick up the covers off of this hidden renewable that's right in front of our eyes and continues to have significant potential."

As part of the Hydropower Vision process, the Department of Energy is working with NREL to update and improve its modeling of hydropower, including the ReEDs model – one of the models cited in the EPA analysis in support of the proposed rule.

For example, NHA observes that earlier versions of the ReEDs model have been used in support of the proposed rule, in which future hydropower growth was appears to be artificially curtailed or restricted in model scenarios showing the doubling of non-hydropower renewables. NHA also observes that outdated hydropower resource assessments and supply curves appear to have been used in that earlier version of ReEDs; both of which have since been, or are being, updated. **Accordingly, reliance on only past versions of the ReEDs modeling (particularly scenarios based on curtailed or restricted hydropower growth) would result in skewed results for hydropower deployment compared to the results the current ReEDs model could provide.**

NHA applauds the DOE and the National Renewable Energy Laboratory for working to update its modeling of hydropower resources. The association encourages the EPA to contact the agencies for the most current status on this work. The best available version of ReEDs should be utilized for citing and use for the purpose of the final rule.

<u>B. The EPA should amend the proposed rule to adopt hydropower-specific considerations and provisions to better account for and accommodate hydropower resources.</u>

NHA is concerned that hydropower's absence from the proposed rule may lead to hydropower being largely "invisible" as states begin their planning and make compliance choices. The rule should ensure that the trade-offs it fosters are explicit. Currently, the design of the rule takes for granted many of the important benefits and attributes hydropower provides. In a rule that aims to address carbon emissions, public policy should not undervalue any non-emitting resource.

The fact remains that hydropower's base load, flexibility, and ancillary benefits are critical to the ultimate success of the rule and the nation's efforts to move to clean energy choice.

NHA recommends the EPA amend the proposed rule to address the inequities that result under its current structure. The methodology does not adequately or appropriately capture the carbon reduction benefits that hydropower has provided for over a century and will provide well into the future. Otherwise, in the implementation of the proposal over the coming years, hydropower resources will be placed in a less competitive position in terms of market and policy support compared to that of the other renewable energy resources.

The early adoption of hydropower generation by utilities, state governments and the federal government, in states all across the country, has resulted in significant carbon emissions savings with continued savings into the future.

As the EPA notes, the inclusion of hydropower generation (particularly the large amounts of existing hydropower generation) under the BSER goal setting formula creates complexities for implementation of the rule. NHA recognizes this challenge and has heard from some of its own members, particularly hydropower asset owners with mixed portfolios and high amounts of existing hydropower generation, expressing concerns that treatment of hydropower similar to that of other existing resources under a rate-based system introduces a series of potential compliance risks for them .

That said, as currently structured, the rule provides potential additional market value and policy benefits to generation from the 60,000+ MW of capacity of existing wind projects (which is larger than the installed capacity of the non-federal hydropower system); 12,000+ MW of solar, 3,500+ MW of geothermal, among others. This will drive more non-hydropower renewables onto the system and create greater need for more flexible, clean energy resources like hydropower.

NHA believes that there are ways, thinking creatively, for the EPA to treat hydropower equitably under the rule without necessarily treating hydropower equally (or in exactly the same way) as other non-hydropower renewables due to the inherent differences of these resources. NHA offers to work with the EPA over the next year to develop those treatments. The discussion that follows outlines some initial recommendations.

1. <u>Affirm hydropower as a compliance option.</u>

   The EPA should make clear in its final rule that states may utilize generation from hydropower assets, including existing hydropower assets, as a compliance option, even if that existing generation is not used in establishing state goals.

   For example, some of NHA's members report that in certain regions of the country there may be uncontracted hydropower capacity at existing plants for which entities needing to reduce their emissions could enter into power purchase agreements with those asset owners in order to facilitate a switch from fossil emitting generation resources to carbon-free hydropower.

   A contract with a new party for generation from an existing hydropower facility represents a new generation resource in the portfolio of the party entering into that contract. States should be allowed to recognize and credit that arrangement, particularly if it is reducing the receiving party's emissions output – one of the goals of the Clean Power Program.

2. <u>Adjust the 2012 baseline year to utilize an average.</u>

   The use of 2012 as the baseline year is a complication for hydropower under the proposed rule. As the EPA correctly points out, there is year-to-year variability in the amount of hydropower generation due to the availability and timing of water based on precipitation levels, snowpack levels and runoff. In some instances that annual variability can be significant. In particular, 2012 was a high hydropower year for portions of the country, like the Northwest. This had the positive benefit of reducing generation from carbon emitting resources in these regions. As a result, the 2012 fossil

emissions rate for those regions was particularly low. Thus, utilizing only the one year to set the fossil emissions rate baseline creates a distortion and is not appropriate for setting states' rate-based goals.

To remedy this, the EPA could utilize an average of 3-5 years, at a minimum, to smooth out the individual yearly impacts on the fossil rate due to the increases (and decreases) in hydropower generation. The EPA should consider different averages for various regions of the country to account for the differing levels of variability over time, similar to the agency's use of a regional approach to estimate renewable resource development potential. For example, a longer 10-year average may be appropriate in some regions, like the Northwest. There are precedents for the use of averaging in other hydropower policy context.[27] NHA member companies have reported that there are examples of states using much longer averages for hydropower in various policy contexts.

3. Adopt a rolling compliance average or water availability compliance "safety valve".

For the same reasons outline above regarding the need to ameliorate the potential compliance risks caused by year-to-year variations in hydropower generation, NHA believes the EPA should provide flexibility in determining compliance with the state rate-based goals.

Decreases in the amount and availability of water for hydropower generation due to weather changes (e.g. precipitation and snowpack levels) as a result of climate change itself is a compliance concern, particularly in hydro-dependent states. Some hydropower asset owners anticipate less generation in future years due to climate change impacts. NHA notes that other owners and other regions anticipate increased water availability or availability in line with historic ranges.

For those that experience the negative impacts, a rolling compliance average (3-5 years) would smooth out any significant reductions in generation due to severe weather events like drought, as well as short-term dry years. Alternatively, the EPA may consider instituting a water availability "safety valve". The details would need to be determined, but the concept would allow the EPA to adjust a state's emissions rate goal should the state see a decline in hydropower generation due to constraints on its hydropower system caused by weather/precipitation issues, specifically for which climate change is playing a role.

This proposal would mitigate some of the compliance risk under the program, particularly for hydropower rich states, for a circumstance that is completely out of the state's (or any individual asset owner's) control. NHA believes it is appropriate for the EPA to provide compliance flexibility for the hydropower industry, which utilizes the resource most directly affected by the very issues the Clean Power Plan was proposed to address.

All of the accommodations above focus on the compliance aspects of the rule and are recommended in order to address the irregularities impacting the recognition and valuation of hydropower's benefits as

[27] In 2005, when Congress included hydropower generation from capacity additions and efficiency improvements as PTC qualifying resources, they also allowed for the use of a 3-year average to determine the baseline from which to calculate the incremental additional hydropower generation.

well as the potential increased compliance hardships that may result from the proposed rate-based structure.

In the end, the rule should do more to ensure that hydropower resources are maintained, enhanced and new generation opportunities pursued for their positive contribution to a low-emissions future. A bad result would be for a carbon emissions reduction rule to result in a low-cost, emission-free resource, such as hydropower, going offline to be replaced with higher cost or higher carbon-emitting resources due to the incentive structures associated with the program – and NHA is concerned that the rule as currently constructed may do just that.

C. If no hydropower-favorable changes are made to the proposed rule, the EPA must re-evaluate the treatment of hydropower under the BSER.

Should the EPA decide against incorporating hydro-specific provisions, the final rule will result in inequitable valuing of the non-hydropower renewables compared to hydropower resources.

NHA foresees states examining and adopting additional policies to preserve and protect the existing generation from resources included in the BSER formula in order to ensure compliance with their goals. Otherwise, if the states do not, that generation may not be available at the anticipated level in order to meet the 2030 goal. This would put additional pressure on the other building blocks, potentially making the 2030 target more difficult to achieve.

In particular, generation from existing hydropower assets, if left out, will be put at a competitive disadvantage, with no such direct value serving as a comparable incentive to protect and preserve that generation. And if hydropower generation is reduced or assets retired, the likely result is an increase in carbon emissions as a significant portion of this base load zero-emitting generation will be replaced by fossil resources, particularly natural gas.

And, in many cases, ensuring the continued availability of generation from existing hydropower assets (whether through upgrades, efficiency improvements or regular O&M programs) is one of the most cost-effective investments to be made.

Therefore, if the EPA rejects NHA's call above for targeted provisions for hydropower and instead affirms the use of the BSER methodology as proposed with no changes, NHA believes the EPA must re-evaluate the treatment of all existing clean energy resources under the rule. There are many options on how to achieve this, some examples are included below.

- Exclude all existing non-hydropower renewable generation from the BSER.

  This would provide a level playing field in the treatment of existing renewable resources, while focusing on the deployment of new renewable energy generation in the setting of the 2030 goals.

- Include some at-risk hydropower generation in the BSER.

Another option would be to include some at-risk hydropower generation similar to the treatment of existing nuclear power generation.

Hydro assets may be at risk due to a variety of conditions: low market revenues, high operating or reinvestment costs, difficulty renewing their permits or licenses (including potential loss of generation as a result of relicensing), or expiring power purchase agreements (PPAs), etc.

On the low end of the scale, the hydropower industry has announced the potential retirement of approximately 2 percent of the system's capacity. At the higher end, approximately 29 percent of the U.S. capacity will have its license expire by 2030.

Depending on what risk factors are considered and/or combined, 5-20 percent of the hydropower fleet could be considered "at risk" and included in the BSER formula.

Treating hydropower in this manner would provide an incentive to minimize the loss of at-risk carbon-free hydroelectric generation that would likely be replaced in significant amounts by carbon emitting resources. It would establish the same policy signal that the rule provides for at-risk nuclear and for the existing non-hydropower renewables.

NHA believes this would begin to transform how policymakers, at the federal, state and local levels, view and value their existing hydropower resources. NHA has further data on at-risk hydropower generation possibilities and offers our assistance to the EPA as it finalizes the rule.

- <u>Include all existing hydropower generation in the BSER.</u>

  Yet another possibility would be to include existing hydropower generation in the BSER calculations both for purposes of determining the renewable energy baselines and setting the 2030 targets, just as such existing generation is included for the other renewable energy resources.

  NHA highlights that even if hydropower is included in these calculations, there remains complicating factors. For one, the proposed rule uses state RPS programs as the foundation in the development of regional target levels of renewable energy generation and annual renewable energy generation levels for each state.

  The inclusion of hydropower as an eligible state RPS resource is inconsistent across the states. In fact, many states have, and continue to, greatly restrict the amount and type of hydropower generation that qualify under the RPS. National policy does not exist for uniform or consistent treatment of hydropower under these programs.

  Ultimately, the underlying policy rationale for some of these RPS programs was to incentivize wind and solar projects. As a healthy, proven and reliable renewable resource, some states determined RPS inclusion of hydropower was not necessary to promote in their state renewable energy policies. And, in fact, most hydropower generation is not RPS eligible under state programs, while most non-hydropower generation is eligible.

NHA reiterates its support for its first recommendation in Section B above – EPA should adopt hydropower-specific provisions and accommodations. At this time, NHA does not provide a preference regarding the options just discussed in this section. More time for analysis is needed to determine potential compliance impacts and market signals any of these changes to the BSER or others may have.

NHA also notes that due to the current construction of the rule regarding the existing hydropower fleet, some asset owners have serious concerns about meeting compliance under the "include all existing hydropower" approach. The risks of non-compliance are perceived to be significant.

D. Alternative Renewable Energy Approach

The Alternative Renewable Energy Approach is based on the technical and market potential of renewables by state.

In brief, to establish a technical potential benchmark for individual states, the Alternative Approach compares each state's renewable energy technical potential against its existing renewable energy generation, resulting in a renewable energy development rate. The average development rate of the top third (16) of states is designated a benchmark development rate for each technology type. The benchmark rate is then applied to each state's technical potential to calculate the benchmark generation for each technology type.[28]

NHA would need further time to conduct a more in-depth analysis of the alternative to determine if this is a more preferred option. While it may be that this structure is workable, NHA reiterates its concerns about the modeling that underlies the Alternative Approach.

To begin, the Alternative Approach modeled hydropower differently than the other renewable resources. In NREL's technical potential study, a 2006 paper on new low power and small hydroelectric plants was utilized. That paper has been supplanted by newer studies and data, not all of which appear to be included.

In addition, the Alternative Approach utilizes the earlier version of the ReEDs model, which as stated above, has recently been updated and improved for hydropower.

NHA offers its assistance to provide additional input on the alternative approach as the EPA finalizes the rule. Again, the Association recommends that EPA collaborate with DOE and NREL to utilize the best information and data on hydropower available to inform its modeling and analysis.

E. Further Compliance Considerations

1. Clear Direction on New Hydropower Generation.

In the rule, the EPA states that "The exclusion of pre-existing hydropower generation from the baseline of this target setting framework does not prevent states from considering incremental

[28] Alternative RE Approach Technical Support Document, P.1-2.

hydropower generation from existing facilities (or later-built facilities) as an option for compliance with state goals."[29]

NHA strongly believes that the EPA must provide more definitive and clear direction and guidance to the states that the Agency supports new hydropower generation as a compliance option under the rule and that states are encouraged to examine ways to incorporate new hydropower generation into their planning.

NHA has highlighted throughout these comments the hydropower resources that are available to states to assist them in meeting the objectives of this rule – capacity additions and efficiency improvements at existing facilities, building on existing non-powered dams, conduit power as well as pumped storage and MHK opportunities, and new infrastructure projects.

However, much of the resource assessments and data on these opportunities is new and not widely known or understood by the states, certainly not by those officials who will be primarily charged with implementing this emissions rule. NHA has been working with states to dispel the erroneous view that future hydropower growth potential is all tapped out.

Combined with the fact that the draft rule does not include new hydropower generation under the BSER with the modeling assuming zero hydro growth, NHA believes a murky and inconsistent message on hydropower has been sent.

As such, the EPA must strengthen its message on new hydropower generation options and unequivocally state that these options are acceptable forms of compliance under the rule.

Related to this point, the language in the proposed rule is unclear as to the ability of states to utilize as compliance options hydropower projects brought online from 2015 through 2019. NHA believes the EPA must clarify that it considers these hydropower projects acceptable for inclusion in state compliance plans. NHA suggests that the EPA consider alternative dates for projects brought online even earlier, such as after 2012 or after June 2014 when the proposed rule was issued.

Project developers should not be penalized by the early commissioning of these projects. To do so discourages near-term deployment, resulting in an increase in carbon emissions that these projects would have otherwise offset.

2. Consequences of the Interim Targets

NHA is concerned about the unforeseen impacts of the interim targets and the 2020 to 2029 glide path in relation to support for new hydropower deployment. According to the EPA's modeling, under its current structure the proposed rule would accelerate the deployment of renewables particularly in the early years.

If the program's signal to states is to aggressively pursue new renewable generation early in the program, deployment of hydropower may well lag behind. In comparison to the non-hydro renewables (as well as natural gas facilities), the hydropower development timeline, including

[29] 79 Fed. Reg. 34867.

licensing, permitting and construction, is significantly longer on average – by years in fact. Natural gas combined cycle facilities can typically be designed, permitted, and constructed without requirements for National Environmental Policy Act (NEPA) review and documentation, for example. Hydropower, as well as other renewables, in contrast, will typically require NEPA review due to federal licensing or location federal lands and waters. The additional time frames are largely related to public involvement processes which are consistent with EPA policies for public participation and environmental consideration.

While NHA continues to propose improvements to the hydropower licensing scheme to increase efficiencies, there is the concern that those improvements are not likely to be fully in place and implemented in time for projects to make as significant a contribution as they could to this needed early action promoted by the rule.

The hydropower licensing process includes NEPA analysis and the public participation components of NEPA as administered by the Federal Energy Regulatory Commission. Due to provisions in the Federal Power Act, hydropower licensing includes more significant involvement of states resource agencies and federal environmental resource agencies than a typical NEPA process.

As noted above, hydropower is the most reliable of renewable resources capable of serving numerous power generation roles including base load, peak, and providing system reliability and voltage regulation function critical to the power grid. Accordingly, hydropower will be necessary to achieve EPA's GHG emission reduction goals under the rule and must be accommodated in order to function as such. In the early years under the EPA proposal, hydropower projects will be asked to do even more to integrate the rapidly growing amounts of intermittent renewable generation stimulated by the rule. The industry has already seen instances when hydropower projects are forced to adjust generation in order to integrate other non-hydropower generation, generally, as well as in times of oversupply.

In these instances, not only is generation from hydropower projects negatively impacted, but in various circumstances the asset owners are not compensated for this service. The interim targets and their impacts may further exacerbate these issues.

NHA recommends the EPA review and reconsider the interim targets and 2020-2029 glide path with these considerations in mind.

3. Flexibility with Conversion to a Mass-based System.

NHA appreciates and supports the flexibility under the proposal allowing states the option to pursue and adopt an equivalent mass-based form of the rate-based goal.

Implementing a mass-based CO2 allowance trading approach that uniformly applies a single carbon price for every ton of CO2 emitted across all CO2-emitting resource types across the broadest regional areas possible may resolve many, if not all, of the irregularities and peculiarities regarding the treatment of hydropower under the current rate-based scheme.

NHA recognizes that EPA released a Technical Support Document (TSD) to assist in the translation of the rate-based goals to mass-based ones on November 4. However, the TSD adds more issues to the discussion and does not appear to provide an equivalent conversion of rate to mass.

The guidance, while appreciated, has been provided at a late date, giving states and stakeholders little time for analysis prior to the comment deadline. Additional time will be necessary to determine whether individual states' mass-based programs (or cooperative programs if states so choose) are workable based on the new mass-based calculation methodology.

4. Attribution of Generation Resources.

The rule is ambiguous with respect to which states may offset emissions where a generation asset serves more than one state jurisdiction with power. NHA recommends that the rule clarify that states have flexibility and autonomy regarding attribution of renewable generation resources. Flexibility and autonomy is important to continue the policy of promoting renewable energy production to the greatest possible extent, and is necessary due to legal precedent and limitations on federal regulation of energy retail markets.

EPA has recognized that different regions have vastly different existing and potential renewable energy capability and potential. Renewable development will be maximized by a flexible policy allowing states to determine attribution of generation resources. This will allow environmental and market based transfer of energy across state lines to meet renewable demand, emissions reduction goals, and general power demand consistent with the limitations of the national power grid and regulation by electric reliability councils such as the North American Electric Reliability Corporation (NERC), and independent and regional transmission organizations.[30]

For hydropower generating assets, allowing flexibility regarding attribution of generation is critical due to the large number of hydropower generating assets which themselves may physically occupy more than one state, or involve coordination between several states. Additionally, some hydropower generation facilities may not themselves span multiple states, but are located on waters which would cross boundaries of several states. Allowing flexibility amongst states to attribute hydropower generation would promote the policy of enhancing hydropower generation by ensuring multiple states could benefit from the clean, renewable power resources produced by the nation's hydropower facilities.

Finally, providing states flexibility regarding attribution of hydropower resources is consistent with federal law and will avoid inconsistency with retail energy markets and the laws governing those markets. Under federal law, states have exclusive jurisdiction to regulate the retail energy market.[31] Without flexibility, it would be possible that power generated and included in transmission to a state or region and therefore ultimately sold on the retail energy market may not be attributed to that state's emissions reduction goals. Therefore, EPA should make clear that attribution of

[30] See 18 C.F.R. Part 35; FERC Order 2000, 89 FERC ¶ 61,285 (Dec. 20, 1999).

[31] Public Util. Comm'n of R.I. v. Attleboro Steam & Elec. Co., 273 U.S. 83, 89-90 (1927); Electric Power Supply v. FERC, Civ. 11-11486 (D.C. Cir. May 23, 2014).

renewables, specifically hydropower, should be determined by states applying intentional flexibility in the rule and within the discretion of state entities such as public service commissions, local boards, or other entities which are authorized to regulate retail sales of power, and in accordance with national reliability councils and transmission system operators.

VI. Other important issues

Below, NHA highlights a series of additional issues that the Association believes further consideration and/or action by the EPA is needed. The potential utilization or impacts on these resources is currently unclear under the proposed rule.

A. Federal Hydropower System

Approximately one half of the U.S. hydropower generation is produced by facilities owned by the federal government. The Corps of Engineers is the single largest producer of hydropower. The Bureau of Reclamation is the second largest producer. The power marketing administrations (PMAs), such as the Bonneville Power Administration (BPA), market wholesale electrical power to their regional consumers.

The uncertain treatment of existing hydropower generally under the rule also begs the question of how hydroelectric generation from the existing federal system will be recognized and accounted for. Whether and/or how this generation is treated could have significant impacts on both state goals and compliance plans.

As an example, many NHA member companies have contracts for power from federal system today or may enter into new contracts for power from the system in the future. The current rule provides no guidance to states and no certainty for these companies on how this carbon-free generation will be treated for purposes of compliance.

In addition, NHA believes that the rule should stimulate a re-investment in the federal hydropower system.[32] While the Bureau of Reclamation reports nearly 3000 MW of new capacity brought online through capital improvements in the last several years, there remains much work to be done, particularly at Corps of Engineers' facilities. For many years, billions of dollars of general hydropower O&M work, as well as some additional upgrades, at these federal facilities have not been budgeted or appropriated, particularly in this time of fiscal constraint.

A policy that seeks to maximize generation from carbon-free resources, like hydropower, should provide the incentive to conduct such work. Yet, it is unclear in the structure of the rule whether that signal will actually be sent.

As such, as the EPA re-examines how hydropower is recognized and treated, NHA also recommends particular attention and focus be paid to the role of the federal hydropower system in meeting

[32] NHA notes that many of the important operating attributes of conventional hydropower discussed earlier in this paper – base load generation, load-following, fast-ramping, etc. – are equally applicable to the large projects in the federal system.

emissions reductions under the rule. We encourage the EPA to engage in a dialogue with the Corps, the Bureau and the PMAs on this issue as the rule is finalized.

Again, at a minimum, this rule should encourage preservation and further investment in the federal system.

B. Hydropower Pumped Storage

NHA expresses concerns over the consideration of energy storage resources under the proposed rule. In the section titled, *The Interconnected Nature of the U.S. Electricity Sector*, the EPA states that "electricity storage is costly and has not been widely deployed."

While it is true that the deployment of distributed energy storage technologies, like batteries and flywheels, has not reached significant levels, the statement does not align with the reality of the U.S. pumped storage sector. In fact, U.S. pumped storage projects currently provide approximately **22,000 MW of capacity totaling 98 percent of all energy storage capacity in the country.**

In addition to these existing projects, there are many proposals at FERC for **an additional 37,000 MW of new projects**, particularly in the western United States.[33]

The benefits that pumped storage projects provide to the grid are myriad.[34]

- Pumped storage has some of the fastest ramping times of any generating resource, which is readily available for peak response.
- It helps mitigate load swings that negatively affect environmental performance of fossil fuel generators during frequent start up and shut down cycles.
- By utilizing the pumped storage system for high demand response, ratepayers realize economic gains.
- Because the charging cycle for pumped storage systems often occurs during the night, and the wind generation cycle generally peaks at night, inclusion of the pumped storage system helps optimize wind resources.

From speaking with U.S. and global industry members, NHA highlights that the rest of the world is moving aggressively to develop more pumped storage. There are currently over 21,000 MWs of new units under construction right now. That is almost equal to the installed U.S. capacity – with no additional units actively under construction in the U.S., though projects have received and are seeking regulatory approval.

Over 5000 MWs of that proposed capacity is slated to come online in Europe alone. Policymakers point to Europe as the prime example of how to increase renewable energy generation, particularly for its

[33] http://www.ferc.gov/industries/hydropower/gen-info/licensing/pump-storage.asp. Again, NHA highlights that FERC regularly updates these numbers throughout the year with the most recent information.

[34] NHA directs the EPA to a recent initiative of the DOE and Argonne National Lab "Modeling and Analysis of Value of Advanced Pumped Storage Hydropower in the U.S. See: http://www.dis.anl.gov/psh.

carbon reduction benefits. However, what is not often discussed is Europe's use of hydropower and pumped storage to integrate that generation while insuring the reliability and stability of their grid.

Because of the clear benefits pumped storage provides, which will help states achieve the carbon reduction goals of the proposed rule, NHA believes the rule should send a clearer message to states confirming EPA's support for pumped storage projects and their use as a compliance option.

Without additional energy storage resources, including pumped storage, states will have a more difficult time achieving EPA's goals given that the Clean Power Plan desires to increase the utilization of natural gas combined cycle units as base load resources, and continue to expand renewable energy generation.

Energy storage helps to smooth out the intermittent nature of renewable energy sources, such as wind and solar. Moreover, if natural gas combined cycle units are utilized as base load, then those units may not be able to ramp as much as they have historically during times of need – a potential concern for grid stability and reliability. And, the Clean Power plan presupposes that natural gas plants will be able to operate at a higher efficiency, something that will be difficult, if not impossible, if utilities need to ramp them up and down more for integration purposes. Pumped storage provides valuable margin and load following resources that historically have been provided by cyclical natural gas units.

NHA requests the EPA re-examine the discussion of energy storage, particularly pumped storage, and amend the rule as necessary to provide a stronger policy signal to states confirming their use as compliance options as states develop their plans.

C. Marine and Hydrokinetic Technologies

Ocean wave, tidal, current and in-stream hydrokinetic resources (known generally as MHK resources) are currently in various stages of research, development and demonstration with a handful of commercial U.S. deployments.

However, MHK technologies represent a substantial opportunity to create reliable, emissions-free generation for the more than 50 percent of the U.S. population living within 50 miles of the coastlines, and for communities and cities across the United States.

In a February 2014 Senate Water and Power Subcommittee hearing, Michael Carr, Senior Advisor to the Director, Energy Policy and Systems Analysis and Principal Deputy Assistant Secretary, Office of Energy Efficiency and Renewable Energy, testified that DOE resource assessments estimate that the technically extractable resource potential for wave energy and for tidal and ocean current represents up to 25 percent of projected U.S. generation needs by 2050.[35]

Several studies have been conducted by the Electric Power Research Institute (EPRI) and others examining the long-term potential of this emerging industry. These studies analyzed theoretical potential, technical resource potential, and practical resource potential.[36]

[35] http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=1574a931-2233-4f98-9d0c-4bd683bbe1e1

[36] http://energy.gov/eere/water/marine-and-hydrokinetic-resource-assessment-and-characterization

In addition, the Federal Energy Regulatory Commission reports 103 MW in issued preliminary permits for project development and another 1300 MW in pending preliminary permits. As mentioned above, preliminary permits represent the earliest stage of project investigation before the filing of license applications to operate.

NHA is uncertain to what extent these MHK studies and FERC numbers were utilized in the EPA modeling under the rule and encourages the Agency to collaborate with the Department of Energy to reference and/or include these studies as part of its analysis.

NHA believes that the EPA should also expand its discussions in the renewable energy section to specifically include MHK resources and amend the rule as necessary to provide a stronger policy signal to states confirming the use of MHK resources as compliance options as states develop their plans.

D. Federal Role in Assisting States to Meet their Emissions Reductions Goals

As discussed throughout these comments, the rule sets ambitious targets in reducing carbon emissions. It presupposes that potential clean energy projects will move forward expeditiously to meet the target dates. Multiple federal agencies, with roles in permitting and licensing, will have a large impact in whether clean energy projects are deployed in time to meet these targets.

Any renewable energy project on federal land requires federal approval. Hydroelectric development requires approval from the Federal Energy Regulatory Commission (FERC), as well as from a myriad of other federal and state agencies including the Departments of Agriculture, Commerce and Interior with their mandatory conditioning authority. In addition, both the Bureau of Reclamation and the Corps of Engineers have additional permitting authority for projects proposed on their infrastructure. Finally, the EPA itself, through its designated authority to the states under Section 401 of the Clean Water Act also has permitting approval responsibility.[37]

For years, NHA and the hydropower industry has worked with these agencies to improve licensing and permitting issues. While progress has certainly been made, too often these processes continue to cause significant delays because agencies cannot coordinate their reviews and /or participate actively and early with project proponents. Should this continue, even with the Clean Power Plan in place, investment decisions and financial support will be deterred and hydropower projects will not be built in time to help states meet their goals.

This is particularly true in two areas – ESA biological opinions and CWA 401 water quality certifications. Of particular interest to EPA should be the actions of the states in implementing Section 401**. In a recent order, FERC stated that of the 43 pending license applications for which FERC staff has completed environmental analysis, 29 (67 percent) are awaiting water quality certification.** Because licensees had withdrawn and re-submitted the applications for water quality certification when the deadline

[37] The hydropower licensing process includes NEPA analysis and the public participation components of NEPA as administered by the Federal Energy Regulatory Commission. Due to provisions in the Federal Power Act, hydropower licensing includes more significant involvement of states resource agencies and federal environmental resource agencies than a typical NEPA process. As a result, hydropower licensing can extend many years in duration.

approached, FERC found that the states have not waived their authority, which the law gives them the power to do if they do not act on an application within one year.

While NHA would not want states to make bad policy decisions by acting on Section 401 applications hastily, the game that the industry is being forced to play to withdraw and re-file their applications will not be helpful in meeting the new emissions reductions goals under the proposed rule. NHA urges the EPA to analyze the performance of states in implementing their Section 401 authority, to make that information publicly available, and to hold a workshop with the states, industry members and other stakeholders to discuss ways to foster improvements.

EPA may very well set the expectation to build new clean energy projects to meet the goals of the Clean Power Plan, but without a federal commitment to expedite licensing of new projects (as well as the relicensing of existing projects) the rule in all likelihood will fall short of its goal.

For this reason, the NHA is also urging that the administration create an ombudsmen office within the White House with the responsibility to expedite hydropower project licensing. This office would have the authority to implement policies to reduce delays caused by the lack of inter-agency coordination. In doing this, the administration should also make it clear to all of the permitting agencies involved in hydropower licensing that these projects are a priority.

Finally, the EPA itself should inform the state Section 401 agencies that their review of hydropower project applications should be conducted expeditiously within the one year requirement and that any certification that takes longer than one year from the date of the first filing will be reviewed by EPA headquarters or the Ombudsmen's office.

VII. Conclusion

NHA appreciates the time and effort the EPA took in developing its Clean Power Plan proposal. As the Agency continues its work toward finalizing a rule in 2015, NHA reiterates its invitation to serve as a resource for staff on hydropower issues and a conduit to the industry for additional feedback and information.

NHA re-emphasizes that hydroelectric power generation resources have played and will continue to play a critical role in meeting carbon reduction goals. Hydropower's zero-emitting profile, along with its ability to provide both base load power and other ancillary grid services, are indispensible for meeting the goals set under the proposed rule.

The Association urges the EPA to adopt the recommendations and provisions included herein, which will better value hydropower's attributes, preserve the country's existing assets, and promote new deployment. Thank you for your consideration of these comments.

Sincerely,

Linda Church Ciocci
Executive Director