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Challenges Facing the US Army Corps of Engineers Hydropower Fleet

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Summary

- U.S. Army Corps of Engineers (USACE) hydropower plants make up 24% of U.S. hydro electricity-producing capability
- Most USACE plants are over 50 years old and are steadily becoming less reliable
- In neglecting to modernize just 54 USACE plants, one report estimated taxpayers will forgo over \$7 billion in sales over the next 20 years
- The funding problem is two-fold: 1) USACE dams are underfunded, 2) most electricity is sold at artificially low rates
- Several potential policy fixes could increase reliability and federal revenues, including allowing private sector financing into the USACE dams, encouraging PMAs to use their legislative authority to fund upgrades, and simply setting rates at market values

Background

The US Army Corps of Engineers (USACE) owns 24% of all American hydropower capacity, making it the largest owner of hydropower in America.ⁱⁱⁱ Dams owned by the Corps make as much electricity as the entire state of Nevada, worth about \$5 billion annually on wholesale markets.^{iii iv} Unfortunately, the majority of Corps plants were built over 50 years ago and are in dire need of upgrades. Many still rely on the same parts installed over three decades ago.^v As upgrades have been deferred and maintenance lags, the plants are breaking down more frequently. The fleet is now thrown offline in “unplanned outages” at twice the acceptable industry standard.^{vi}

When the plants breakdown or operate below optimal levels, taxpayers lose money because sales from the vast majority of USACE plants flow directly back to the U.S. Treasury. According to a 2008 Corps analysis, neglecting to modernize just 54 of its plants would result in \$7 billion of forgone electricity sales over the 20 years.^{vii} New equipment would simultaneously increase reliability and total generating capacity, benefits that would increase flows to federal coffers.

Problems with the current upgrade process

Despite generating an annual \$2-3 billion for the U.S. Treasury, only a fraction is reinvested back into the fleet by the federal government. In 2013, less than 10% was spent on operations and maintenance.^{viii} Compared to the private sector, the government spent three times less on refurbishments, replacements, and upgrades from 2005 to 2014.^{ix}

The cumbersome process needed to secure federal funding for upgrades and maintenance is a one part of the problem. To date, most water infrastructure projects individually rely on Congress and OMB to provide non-routine maintenance – a process which can take over a decade.^{xxi} A systematic process to quickly identify, analyze, and fund modernization projects has not emerged.

Running the USACE hydropower fleet into the ground is not the only option. Many other of the federal departments, such as the Tennessee Valley Authority (TVA) and Bureau of Reclamation, operate dams with much more reliable equipment.^{xii} These departments are unique because they can use proceeds from electricity sales to directly finance their upgrades. As of 2014, TVA had incrementally upgraded 60 plants of its 111 plants since 1992 and expects to complete the remainder by 2030.^{xiii}

USACE does not sell power directly to the public. The responsibility of selling power falls to intermediate federal organizations called Power Marketing Administrations (PMAs). These PMAs – such as the Western Area Power Administration (WAPA) and Southeastern Power Administration (SPA) – are required by law to sell the power at the "at the lowest possible rates" and forgo any profits.^{xiv} A CRS report found one PMA rate was 44% less than the national average. It even found these rates are often lower than the costs needed to maintain the plants.

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Potential solutions

#1: Private-sector collaboration. In today's current political environment, large sums of government funding may not be available for retrofits. A more conservative approach could exist in the form of private sector financing. The private sector has interest in providing financing to fund upgrades, but USACE lacks authority to engage in private-sector deals.^{xvi} Under this type of agreement, private capital would directly finance the upgrades in exchange for a share of the increased revenue. Complete privatization of the Army Corps fleet is unlikely because the dams serve many non-power needs, such as flood control and water supply, which serve the public interest.

#2: Dedicated funding sources. Each PMA could finance improvements by levying a fee on local customers (who already receive below-market electricity rates). A law passed 15 years ago – Sec. 212 of the Water Resources Development Act of 2000 – allows PMA customers to pay for nonroutine projects upfront.^{xvii} Research should be conducted to see if Sec. 212 can be better leveraged or reformed to modernize the USACE fleet.^{xviii}

#3: Charge market rates. Allowing PMAs to charge market rates would open up new funding without affecting U.S. Treasury funds or the federal debt. This fix, however, may require legislative changes because PMAs are locked into long-term rates with local cooperatives, utilities, and industry.^{xix}

i <http://www.iwr.usace.army.mil/Portals/70/docs/iwrreports/2011-WRO-P-02.pdf>

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<http://www.sas.usace.army.mil/About/DivisionsandOffices/OperationsDivision/RichardBRussellDamandLake/Hydropower/HydropowerandtheCorps.aspx>

iii <https://www.eia.gov/electricity/data/state/>

iv http://www.nap.edu/catalog.php?record_id=13508

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vi [\[la.com/documents/NALF5/presentations/10.30.13/2ColonialRoom/1ElectricityGenerationTransmission/6USACE.pdf\]\(http://www.cg-la.com/documents/NALF5/presentations/10.30.13/2ColonialRoom/1ElectricityGenerationTransmission/6USACE.pdf\)](http://www.cg-</p></div><div data-bbox=)

vii <https://www.fas.org/sgp/crs/misc/R42579.pdf>

viii http://www.nap.edu/catalog.php?record_id=13508

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http://www.energy.gov/sites/prod/files/2015/04/f22/2014%20Hydropower%20Market%20Report_20150424.pdf

x [\[la.com/documents/NALF5/presentations/10.30.13/2ColonialRoom/1ElectricityGenerationTransmission/6USACE.pdf\]\(http://www.cg-la.com/documents/NALF5/presentations/10.30.13/2ColonialRoom/1ElectricityGenerationTransmission/6USACE.pdf\)](http://www.cg-</p></div><div data-bbox=)

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http://www.energy.gov/sites/prod/files/2015/04/f22/2014%20Hydropower%20Market%20Report_20150424.pdf

xiv <http://www.eia.gov/todayinenergy/detail.cfm?id=11651>

xv <https://www.fas.org/sgp/crs/misc/R42579.pdf>

xvi <http://www.usbr.gov/power/hydropower-mou/HydropowerMOU.pdf>

xvii <http://www.lrn.usace.army.mil/Media/NewsStories/tabid/6957/Article/617846/hydropower-optimization-increases-energy-production-at-corps-plants.aspx>

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http://www.energy.gov/sites/prod/files/2015/04/f22/2014%20Hydropower%20Market%20Report_20150424.pdf

xix http://www.nap.edu/catalog.php?record_id=13508