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Dear Mr. Boehler, Ms. Avett, Mr. Herscowitz, and Ms. Boomgard:

Friends of the Earth U.S., Greenpeace USA, International Accountability Project, Natural Resources Defense Council, Oxfam America, and Sierra Club write to express our concerns with the U.S. International Development Finance Corporation's (DFC's) proposal to take nuclear off of its Categorical Prohibitions list in its Environmental and Social Policy and Procedures (ESPP). This policy change would not only reverse DFC's long-held position, but would put DFC at odds with most other development finance institutions, which do not allow support for nuclear power projects because of their high-risk and elusive development impacts.

As an initial matter, we note that DFC suggests in its public consultation notice that a primary purpose of the proposed policy change is to enable DFC to fund advanced nuclear technologies like small modular reactors (SMRs). However, DFC's actual proposal is much broader and would allow DFC to finance any nuclear reactor technology, including large-scale reactors using decades-old technology. DFC should clarify its intentions. If, as the notice implies, DFC is only interested in funding next generation SMRs, it should say so explicitly, and not consider overbroad revisions that also lift the prohibition on existing reactor technology.

Our view, however, is that neither existing reactors nor advanced reactors like SMRs should be eligible for DFC support, as neither offer reasonable development opportunities in the foreseeable future. Existing reactor technologies are well-known money pits and inappropriate for DFC support on cost, competitiveness, safety, waste and proliferation grounds. Advanced reactors are speculative, yet-to-be developed technologies. Until they have amassed a meaningful record of safe commercial deployment and operation, consideration of DFC support is, at best, premature.

As explained in greater detail below, the existing categorical prohibition on both sets of technologies should remain wholly in place.

1. Existing Reactor Technologies.

1.1 Cost and Competitiveness

Nuclear power has long been derided as "too expensive to finance" and "the largest managerial disaster in business history." That, more than anything, is why the U.S. nuclear industry has been almost completely incapable of selling its products to the U.S. electricity industry for more than a quarter century. In the two cases where it has secured contracts for new plants, it has so comprehensively failed to deliver on those contracts that the plants were either years late and billions over budget or abandoned unfinished.[1]

Given this lamentable record, it is simply fanciful to believe that the U.S. nuclear industry can suddenly reform itself and, with some incremental financing from DFC, deliver on-time, on budget, high development impact projects in the developing world.

The truth is that nuclear power is wholly uncompetitive with renewable alternatives, even when the inevitable delays and cost overruns of nuclear plants are disregarded. According to a nuclear industry report, the cost of generating power from solar and wind ranges from $29 to $56 per megawatt hour (MWh), while nuclear power costs between $112 and $189 per MWh.[2] This lack of competitiveness is even more true when deployment lags are factored in. A nuclear plant that began construction today would not begin to deliver power until at least 2030. Average construction time worldwide is 9.8 years. For example, the Vogtle application for an early site permit went in in 2006, construction began in 2009, and it *might* go online in 2021. As the costs of renewable energy and storage have continued to quickly decline over the past decade, the costs of nuclear energy have increased by 23 percent.[3]

Nuclear power also comes with an enormous opportunity cost vis a vis renewable alternatives. Whereas a nuclear plant takes an average of ten years to build, renewables can be completed in two years.[4] That means that DFC's contribution can be returned much faster, and redeployed to meet other development needs.

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[1] Compare estimated overnight costs in Massachusetts Institute of Technology, *The Future of Nuclear Power*, 2003 https://web.mit.edu/nuclearpower/pdf/nuclearpower-full.pdf, with actual costs of plant construction in Brad Plumer, *U.S. Nuclear Comeback Stalls as Two Reactors Are Abandoned*, New York Times, July 31, 2017, https://www.nytimes.com/2017/07/31/climate/nuclear-power-project-canceled-in-south-carolina.html, and Zack Hale, *Monitor sees Vogtle nuke missing in-service dates, exceeding cost projections*, S&P Global, June 8, 2020, https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/monitor-sees-vogtle-nuke-missing-in-service-dates-exceeding-cost-projections-58964039.

[2] Marton Dunai & Geert De Clercq,*Nuclear Energy Too Slow, Too Expensive to Save Climate: Report*, Reuters, Sept. 23, 2019, https://www.reuters.com/article/us-energy-nuclearpower-idUSKBN1W909J.

[3] *Id.*

[4] Renewables First, *What is a wind turbine project timeline?* https://www.renewablesfirst.co.uk/windpower/windpower-learning-centre/how-long-will-the-whole-project-take/; *The World Nuclear Industry Status Report 2019*, Sept. 2019 https://www.worldnuclearreport.org/The-World-Nuclear-Industry-Status-Report-2019-HTML.html.

1.2. Nuclear Will Not Improve Energy Access

Nuclear does not make sense to improve energy access. About 58 percent of people in low income countries lack access to electricity.[5] The majority of those people live in rural areas where nuclear reactors of any form are unlikely to be constructed. To build the necessary transmission and distribution infrastructure would take time and be prohibitively expensive. To increase access to electricity, such countries would need to prioritize investment in small distributed systems. Small solar systems would make the most sense in these poor rural areas, which often have abundant solar resources. Mini-grid wind systems have also proven an effective means of improving access to electricity in countries like Ethiopia.

1.3 Financing Nuclear Will Compromise Nuclear Security

Among energy choices, nuclear power is unique in that there are substantial overlaps between civilian energy technology and military applications of the technology for nuclear weapons. Nuclear power, nuclear proliferation, and nuclear disarmament are inextricably linked – technically, militarily, and politically. Simply, a civilian nuclear power program is a first step to acquiring the atomic bomb; even a small uranium enrichment facility providing fuel for one or several reactors is sufficient to support a significant nuclear military capability. There are many different advanced models being worked on, including fusion, and each will have its own unproven balance of economic, health, safety, and environmental risks. Until there is a nuclear program that exists based on a reactor type that somehow has zero proliferation risk, all nuclear programs are first steps to bombs. While the risk of proliferation can be managed, it can never be eliminated. That is why prevention is of utmost importance.

1.4 Nuclear Is Not Clean Energy

Moreover, nuclear also has significant safety, global security, and environmental risks. Specifically, nuclear power produces a waste stream that remains extremely toxic and represents a massive proliferation risk for many millennia. Already, as of December 2013, existing nuclear capabilities have 250,000 tons of nuclear waste building up in temporary storage.[6] No country has yet successfully completed a repository to safely permanently dispose of that waste. The global effort required to engineer, site, operate, and regulate the dozens of repositories that will be needed to address the already produced nuclear waste is staggering. As developed countries are struggling to address their own nuclear waste burdens, it is unclear how a developing country would be prepared to. Any consideration of financing new nuclear must take into account how it will contribute to this waste crisis; and DFC specifically must take this cost into account when considering allowing the financing of nuclear projects.

1.5 Nuclear Is High Risk - Low Development

[5] The World Bank, Access to Electricity (% Population) – Low Income, https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=XM (last accessed June 17, 2020).
[6] International Atomic Energy Agency, Status and Trends in Spent Fuel and Radioactive Waste Management, 2018, https://www-pub.iaea.org/MTCD/Publications/PDF/P1799_web.pdf.

Moreover, it remains unclear how a nuclear project would score positively in DFC's measurement of development outcomes through its impact quotient (IQ). Nuclear power plants, including advanced reactors like SMR, would most likely be considered as High-Risk Category A projects primarily around the radioactive waste generated. This would score poorly on the E/S Risk Adjustment. Additionally, the IQ would likely score poorly on a range of metrics from contribution to economic growth, quality jobs, and inclusion. Therefore, it seems unlikely that the IQ would ever score a nuclear project high enough for DFC to approve the project without exaggerating the positive impacts and downplaying the risks. Renewables plus storage provide stronger development benefits, such as improved access to electricity, without the security, waste, and financial risks.

1.6 Weakening DFC's Categorical Prohibition on Providing Support to Nuclear Reactors Would Run Afoul of Clear Congressional Direction in the Consolidated Appropriations Act of 2010, Applied to DFC Through the Build Act, that DFC Environmental Policies Meet World Bank Standards.

In the Consolidated Appropriations Act of 2010, Congress directed OPIC to update its environmental and social guidelines, with binding requirements to be consistently applied to all of its projects. (Section 7079(b)). Congress's goal was clear: it wanted OPIC to strengthen its standards and bring them into line with international best practices. To that end, it required that the new regulations "shall be no less rigorous" than both OPIC's existing guidelines and the environmental and social policies of the World Bank Group.

OPIC heeded Congress's directive, updating its Environmental and Social Policy Statement (ESPS) in October 2010. Among its strengthened provisions, the revised ESPS included the current ban on projects involving the "production of or trade in radioactive materials, including nuclear reactors and components thereof." (Appendix B, para. VIII). This provision was necessary to ensure that the new ESPS was "no less rigorous" than World Bank Group standards, as IFC already had (and still has) a similar prohibition. (IFC Exclusion List, (2007))

Both the ESPS and Congress's intent that its provisions "shall be no less rigorous" than World Bank standards were carried over to DFC through the Build Act's "Saving Provisions." The ESPS—including the categorical prohibition on supporting nuclear power plants—applies to DFC under Sections 1466(a)(1) and (2), which provide that OPIC's policies are automatically adopted by DFC. [7] And Congress's directive that OPIC's policies not fall short of World Bank standards applies to DFC under Section 1466(d), which provides that all references to OPIC in statutes that predate creation of DFC "shall be deemed to refer" to DFC.

It is true that Section 1466(a) allows DFC to change the policies that it inherits from its predecessors. But the general provision in 1466(a) that authorizes such policy changes does not eliminate Congress's specific direction that World Bank policies provide a floor. Thus, while

[7] See, Letter from Cameron S. Alford, Deputy General Counsel, OPIC, to Congressman Brad Sherman, May 8, 2018.

DFC ordinarily has broad latitude to change its legacy policies, it should not exercise that discretion to contravene Congress's clear preference that those policies shall not drop below World Bank standards.

For this reason, DFC should maintain prohibitions on funding nuclear power plants that are consistent with IFC standards.

2. SMRs

2.1 Advanced Nuclear Is Not Deployable

In proposing removing the production of nuclear materials from its Categorical Prohibitions, DFC suggests that it hopes to fund advanced nuclear technologies like SMRs and microreactors that it states are "under development and deployment in the United States." This is an inaccurate description. These new reactor types exist only as theoretical designs. They have never been prototyped and tested for safety, reliability, and cost. While many companies are developing different potential SMRs, "[s]ignificant technology development and licensing risks remain in bringing advanced SMR designs to market."[8] Advanced nuclear is not ready to play a role in economic development for the foreseeable future.

SMRs will not be available until at least the middle of the decade. While proponents are convinced SMRs could be deployed domestically by the mid-2020s, and the first U.S. pilot reactor is projected to be operational by 2027, this is, at best, an optimistic guess.[9] Juxtaposed against this optimistic projection is the entire history of the nuclear industry, where construction takes far longer and costs much more than any original prediction.[10]

Any type of experimental technology, even in the most robust and comprehensive regulatory environments, require stringent oversight, and, in many instances, additional and sustained support to ensure viability. These complexities are often compounded in developing countries as a 'risk-multiplier,' only adding further institutional burdens and requirements to host governments and ultimately forcing the citizens to bear the burdens. It is not the DFC's place to be expending time and resources for such high-risk, low development return ventures that are yet to be proven commercially, especially when there exist numerous renewable technologies that are proven commercialized performers at meeting development needs.

Not only is there no evidence that SMRs will work, and work safely, but there is also no evidence of the actual cost of deploying an SMR.[11] More to the point, it is unclear that, once

[8] U.S. Department of Energy, *Advanced Small Modular Reactors*, https://www.energy.gov/ne/nuclear-reactor-technologies/small-modular-nuclear-reactors.
[9] Nuscale, DOE Partnership, Nuscale Wins U.S. DOE Funding for Its SMR Technology, https://www.nuscalepower.com/about-us/doe-partnership.
[10] David Schlissel and Bruce Biewald, *Nuclear Power Plant Construction Costs*, Synapse Energy Economics Inc., July 2008, http://large.stanford.edu/courses/2016/ph241/keller2/docs/schlissel.pdf.
[11] Jim Green, *Small modular reactor rhetoric hits a hurdle*, June 23, 3030, https://reneweconomy.com.au/small-modular-reactor-rhetoric-hits-a-hurdle-62196/.

deployable, SMRs will be economically competitive.[12] While light water SMRs should cost less than large light water reactors, the cost per unit of power will be much higher.[13] One reason for this is that SMRs lose out on economies of scale, making them more expensive than large reactors per unit of capacity.[14] And assembly line manufacturing does not solve the issue because SMR assembly lines, like SMRs themselves, have not yet come to fruition and thus will require a significant up-front investment.[15] For this reason, two main U.S. nuclear corporations, Westinghouse and Babcock & Wilcox, are no longer developing SMRs.[16]

Simply, advanced nuclear technology cannot be relied on to be available soon enough. Until SMRs are actually deployed, they will remain a pipe dream for addressing energy needs. DFC should wait for demonstration projects and actual deployment before considering how those technologies could contribute to DFC goals.

2.2 SMRs Do Not Provide Clean Energy

SMRs are no different than traditional nuclear power plants in terms of waste production; they cannot be considered clean energy nor safe due to the amount of waste created and the proliferation risk. SMRs produce the same if not more waste per kilowatt hour than conventional nuclear reactors.[17] Moreover, SMRs have a potentially higher cost of radioactive waste management and safeguarding because the spent fuel they generate has a high fissile content, which increases the risk of proliferation.[18]

The Overseas Private Investment Corporation (OPIC) -- as the predecessor to DFC -- led the world on energy investments with the size and quality of its renewable energy portfolio resulting in high development returns on investment. In the last years of OPIC, we saw an alarming shift in its energy portfolio. In 2019, OPIC's support for fossil fuels greatly increased at over $1.7 billion (compared to nothing in 2018 and $1.1 billion in 2017), while its support for renewables was less than $500 million (compared to over $800 million in 2018 and almost $500 million in 2017).[19] SMRs would only continue to detract from the good work that the DFC can do on renewable and truly sustainable energy.

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[12] The World Nuclear Industry Status Report 2019, Sept. 2019 https://www.worldnuclearreport.org/The-World-Nuclear-Industry-Status-Report-2019-HTML.html.
[13] Morgan, M. Granger, Ahmed Abdulla, Michael J. Ford, and Michael Ratha. "US nuclear power: The vanishing low-carbon wedge." *Proceedings of the National Academy of Sciences of the United States of America*. 115 (28) 7184-7189. July 10, 2018. http://www.pnas.org/content/115/28/7184
[14] Sovacool B K, Ramana M.V (2014): Back to the Future: Small Modular Reactors, Nuclear Fantasies, and Symbolic Convergence, Science, Tech and Human Values. https://doi.org/10.1177/0162243914542350.
[15] Thomas, Steve, Paul Dorfman, Sean Morris, and M.V. Ramana. "Prospects for Small Modular Reactors in the UK and Worldwide." Nuclear Consulting Group and Nuclear Free Local Authorities. July 2019. https://www.nuclearconsult.com/wp/wp-content/uploads/2019/07/Prospects-for-SMRs-report-2.pdf
[16] *Id.*
[17] Thomas, *supra* note 3.
[18] Glaser A., Hopkins L.B., Ramana M.V. (2013): Resource Requirements and Proliferation Risks Associated with Small Modular Reactors, Nuclear Technology184 (2013): 121–29, https://www.ans.org/pubs/journals/nt/article-19873/.
[19] Kate DeAngelis, *A Surge in Support: A Review of 15 Years of OPIC's Energy Financing* (forthcoming).

2.3 Wealthier Countries Will Benefit at the Expense of Poorer Countries

The infrastructure and expertise required to set up and run nuclear power systems means that only wealthier countries will benefit from DFC support in this area. Many of the world's poorest countries – that DFC was designed to help – are decades away from being able to install, run, and decommission nuclear power projects, let alone address the waste nuclear reactors produce and manage the potential security concerns.[20] DFC has committed for 60 percent of its support to go to low income countries, but it is unlikely that any of these countries could benefit from nuclear support for the reasons noted above. Therefore, any support that DFC provides for nuclear will almost certainly go to wealthier countries likely in Eastern Europe;[21] for instance, Poland has expressed interest in SMRs.[22]

2.4 DFC Should Not Subsidize Unproven Technologies

DFC's mission is to help finance development abroad in a way responsible for American taxpayers. The proposal to end the prohibition on nuclear, when the technology has not been proven as a cost-effective and fully deployable option, calls into question motivations for pursuing financing nuclear projects. With few developers in the world pursuing new nuclear construction, we request that any comments on changes to DFC's nuclear policy require a conflict of interest declaration by any parties, including public notification if the organization is currently developing nuclear technology or funded by a company pursuing nuclear technology. DFC should not be in the business of subsidizing U.S. companies' unproven technologies if the outcomes will come at the expense of communities abroad and U.S. taxpayers.

In 2010, OPIC made the decision to include a prohibition on nuclear in its Environmental and Social Policy Statement to put OPIC's policies in line with the policies of other development finance institutions. To undo this policy a decade later, would not only put DFC out of step with the rest of the development community, but would be the wrong direction for this new agency to go. In light of this and the other concerns raised in this letter, we urge DFC to keep its categorical prohibition on supporting nuclear power.

Sincerely,

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[20] See Blue Ribbon Commission on America's Nuclear Future, January 2012, https://www.energy.gov/sites/prod/files/2013/04/f0/brc_finalreport_jan2012.pdf (detailing U.S.'s long history of nuclear waste and the failure to resolve it). International Atomic Energy Agency, Criticality Safety in the Handling of Fissile Material, 2014, https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1594_web-51742615.pdf (detailing the careful management of fissile materials necessary for security).

[21] Aaron Larson, *Small Modular Reactors Gain Momentum in Europe*, Power, Oct. 23, 2019, https://www.powermag.com/small-modular-reactors-gain-momentum-in-europe/.

[22] GE, Press Release, *GE Hitachi Nuclear Energy Announces Small Modular Reactor Technology Collaboration in Poland*, Oct. 21, 2019, https://www.ge.com/news/press-releases/ge-hitachi-nuclear-energy-announces-small-modular-reactor-technology-collaboration.

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