



Renewable Energy Plans and Power Augmentation of Existing Hydropower Reservoirs: Propagating the Lessons from the Mekong River Basin

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NHI wishes to present the initial findings and lessons learned from an exciting collaboration in the Lower Mekong Basin with the Royal Government of Cambodia (RGC) and the Government of Lao PDR (GOL), in which NHI and its technical team of world-class, interdisciplinary experts have developed renewable energy plans that will meet these countries' energy goals without the environmental and social impacts of conventional power sources. The alternative plans include solar augmentation of power output of existing hydropower reservoirs that would supplant the need for proposed new dams, dramatically advance renewable energy generation and counteract the inevitable effects of sea level rise. In the case of Cambodia, the Sambor Dam would be replaced by placing floating solar panels on the Lower Se San II reservoir, which is now built and has already exacted its environmental toll. The Sambor reach experiences the largest migration of fish biomass on the planet and sustains its most productive freshwater fishery. It is imperative that it remain unobstructed. In Lao PDR, the solution is to "hybridize" the largest reservoir in the basin, the Xekaman 1 Reservoir, which is the centerpiece of a plan to replace all of the mainstream dams in the last remaining free-flowing portion of the entire Mekong River system – the Xekong. It also contributes more sediment to the Mekong Delta than any other tributary, which is necessary to prevent the delta from disappearing completely due to climate change.

It is hard to overstate the transformative possibilities of the solar-hydro hybrid alternative. There are today over 25,000 large hydropower dams operating the world, which supplies about 20% of power generation globally. If all of these were retrofitted with floating solar arrays in just the way that the projects in Cambodia and Lao will illustrate, the increase in renewable power could be huge. According to the IEA Renewables 2017 Report, "new solar PV capacity around the world grew by 50% in 2016, reaching over 74 GW, and for the first time surpassing the net growth in coal" (<https://www.iea.org/renewables/>). And, the floating solar technology can be brought on line much more quickly than any other alternative with greatly reduced financial risks. The projects that the NHI team are designing and assessing in Southeast Asia would be the largest utility scale exemplars of hybrid (floating) solar-hydro operations yet deployed, and could serve as a global model.