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Hydro-Economics Tradeoff Surfaces to Guide Unit Commitment in Production Cost Models

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This paper aims to assess the discrepancy in hydropower representation between conventional PCMs and hydro scheduling tools and propose a new method to account for hydrological and environmental aspects in PCMs. To achieve this, three scenarios are simulated. The first scenario simulates hydropower operations using a conventional PCM. The second scenario uses an iterative method to integrate into a PCM the hydropower operations modeled by a hydro scheduling tool. The third scenario explores a hybrid alternative in which hydropower operations are simulated based on dynamic hydropower parameters calculated from detailed environmental constraints. These dynamic hydropower parameters are calculated via “surfaces”, or bivariate functions, generated in advance by the hydro scheduling tool used in scenario 2 under numerous hydrological conditions.