Political and physical limits to using formerly glaciated regions for hydropower production

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Glacier retreat changes hydropower production, both by changing melt patterns and seasonality and by revealing new possible reservoirs. This holds potential for expanding the production of hydroelectric power. However, these glaciers are typically situated in valuable nature and protected areas, making the construction of new infrastructure difficult. Mitigating climate change by producing renewable energy therefore comes in conflict with protecting nature.

In this study, we present survey results from the Norwegian Panel of Elected Representatives to investigate how democratically elected politicians approach such trade-offs, the conflict between protecting global climate or local nature. Which arguments drive support or opposition to building a hypothetical hydropower dam? How do they relate to the politicians’ personal and political background? Interestingly, we find that politicians that are more concerned about climate change also are more opposed to building new hydropower infrastructure.

In addition, we assess how the physical potential of hydropower will change in Norway under climate change. As a case study, we simulate the surface mass balance of Folgefonna ice cap to the end of the century under a range of climate scenarios. This enables us to quantify how uncertain such future projections are and to what degree we can provide policy makers with reliable information on hydropower potential. Thus, by a multidisciplinary approach, we assess both the physical and political potential for new hydropower due to glacier melt.