

Executive Summary

During the summer of 2020, StormGeo together with Statnett and other partners submitted a research proposal named PROWD to the Norwegian Research Council. Despite PROWD not receiving this grant, the initial success in the evaluation phase has led to further collaboration between StormGeo and Statnett, focused on the use of satellite-based technologies for powerline monitoring. As a product of this collaboration, the Satellite Technologies Feasibility Study for Power Lines (SAFES) study has been conducted to better understand the cost-benefits and technical advantages of satellite technologies.

For the SAFES project, we have investigated the availability of various satellite imagery technologies in the market and their feasibility for Statnett with a focus on vegetation monitoring along powerlines. Pricing information from international satellite data providers including Airbus, MAXAR, Satellogic and Planet were used to estimate prices per square kilometer of line for forested regions of the Statnett transmission network. Forested regions were identified using the Copernicus discrete classification product, and these areas were broken into two categories: areas contained within satellite image provider's image archives, and areas requiring newly tasked imagery to cover—each with their own price acquired from satellite providers.

Per inputs from major satellite data providers, we estimated a range of prices for satellite images, which considered pricing effects due to resolution, quality, and the acquisition time (historical or new images). Archived costs were calculated from the length of forested line in the archive multiplied by the minimum archive purchase width and tasked cost per km². Tasked imagery costs were calculated from the number of estimated tasked captures multiplied by the capture area and tasked cost per km².

The summary of cost estimates is presented in the tables below. Table 1 includes various combination of archived (historic) images and tasked (new acquisition) images for the forested portion of Statnett lines (5746km). For areas identified to be forested, purchasing costs for imagery were estimated to range between 25 and 718 NOK/km; though, as discussed in this report, a plausible percentage of coverage by archived imagery for a single year, may be closer to 60% with resulting range in cost from 251 to 546 NOK/km. A review of additional costs and savings is discussed. These costs are for one full acquisition of the entire forested area of Statnett's transmission network.