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The VRFB system has been largely studied for almost 30 years. Several plants are installed around the world, with power and energy exceeding some MW and some MWh respectively and new companies are entering the growing market. However, a real widespread application of this technology is hindered by its high capital cost. One method to make these batteries more competitive on the market is to increase their cyclability by means of appropriate maintenance procedures. In this work, a review of the most important and realizable maintenance procedures and their impact of the system cost is presented, considering both operative and economical points of view. In order to evaluate how the maintenance costs impact on the VRFB economy, specific cost indicators have been used, in particular the levelized cost of storage (LCOS) and the net present value (NPV). This analysis shows how the LCOS of a vanadium redox flow battery decreases as the energy stored and E/P ratio increases, in the case of 20-year daily operations. For E/P = 2h the LCOS is between 1.15 and 1.6 € kWh^{-1}, and for E/P = 12h the LCOS is between 0.31 and 0.41 kWh^{-1}, depending on the maintenance procedure adopted. Moreover, the study suggests that an industrial system is more profitable than the residential one. Indeed, a VRFB system with a power P = 1MW and E/P = 12h (industrial size) can recover the initial investment (NPV = 0) in ten years with an energy sales price between 0.38-0.45 € kWh^{-1}, which is close to the average price of the EU market. A smaller system, instead, with a power P = 6 kW and E/P = 4h (residential size) requires a higher energy sales price, between 0.74-0.80 € kWh^{-1}. This latter can become competitive only with a longer lifetime, hence confirming that an efficient maintenance procedure plays an essential role.

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