

# Hydropower energy recovery in mines: Pump As Turbine technology and case studies

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## ABSTRACT

Mining is one of the industries with the highest energy and water consumption. In Australia, the sector can account for around 10% of the nation's total energy use. Reducing this demand is imperative to enhance sustainability metrics and reduce costs. At the same time, most underground and open cut mines feature complex hydraulic networks with water being used for a variety of processes such as drilling, air conditioning, dust abatement, leaching, flotation, tailings transportation. In many sections of a mine's hydraulic network there are opportunities to recover excess hydraulic energy and convert it to electricity. The renewable power thus generated can either be fed directly into the mine's internal power grid for self-consumption or can be used locally for applications such as the charging of Battery Electric Vehicles (BEVs). This article introduces the use of Pumps As Turbines (PAT) as hydraulic energy recovery devices in mining water infrastructures. Three successful projects are showcased, each developed in various mining-related assets. These examples alone can generate around 1 GWh annually and prevent 230 tons of CO<sub>2</sub> emissions per year alongside the economic savings in reduced energy purchase. Finally, the potential for widespread adoption of this technology is outlined.