



Feasibility of pumped hydro storage for energy production and flood mitigation in Pekan

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ABSTRACT

The purpose of this paper is to study the feasibility of flood water catchment integrated with pumped hydro storage plant for energy production and new flood mitigation in Pekan, Pahang. The application of pumped hydro storage basically is to improve the peak power scenario by storing electric energy in the form of hydraulic potential energy, but in this study the lower reservoir is designed to capture and store the excess water from the flood event to reduce the peak discharge at the downstream. The water collected in the lower reservoir will be pumped into the upper reservoir for production of energy. The study on this paper comprises on estimation of required storage volume for flood attenuation, description of proposed pumped system and operation principle, estimation of power output and power input and also the capabilities and environmental benefits of the power plant. The proposed power plant was estimated to support 37.8 % of energy demand in the flood prone areas with a mean value of the power output is 19.3 MW and power input is 34.3 MW. As estimated, 33 200 tonnes of avoided carbon dioxide emission can be translated into carbon credits and can be further translated into monetary value which equivalent to US\$ 99 600 - US\$ 332 000 or RM 419 420 - RM 1.4 million can be generated per year. From the results, a new concept of sustainable flood mitigation can be adapted to turn the problematic floods into a sustainable source of energy.

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