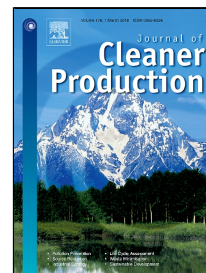


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Integrated energy and economic evaluation of a case tidal power plant in China

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# 1 Integrated energy and economic evaluation of a case tidal power plant in 2 China

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## 7 Highlights

- 8 ● The Jiangxia Tidal Power Station was evaluated using energy and economic methods.
- 9 ● It lacks competitiveness compared to other renewable power alternatives.
- 10 ● The current exploitation pattern has high economic and environmental costs.
- 11 ● A production model and new materials are required through technical innovations.

12 **Abstract:** Although endowed with abundant tidal resources, China's tidal power generation industry has been  
13 largely lagging behind other renewable energy alternatives such as small hydropower, photovoltaic power,  
14 wind power and biomass-based power. To probe the reasons behind this slow pace of development, an energy  
15 evaluation and an economic analysis were conducted on the Jiangxia Tidal Power Station (JTPS), which has an  
16 installed capacity of 4.1 MW. The JTPS is the largest tidal power station in China and the fourth largest in the  
17 world. The evaluation results exhibited a total power conversion system energy use of  $1.59E+19$  sej to  
18 generate  $5.90E+13$  J of electricity in 2014. Tidal energy only accounts for 16.54% of the total energy budget.  
19 The rest of the resources were invested to capture and convert tidal energy to electricity, thereby generating a

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