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Energy Return on Investment (EROI) of China's conventional fossil fuels: Historical and future trends

Yan Hu ^a ... Alexandre Poisson ^b

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Abstract

One of useful metrics for analyzing the production of fossil fuels in China is Energy Return on (Energy) Investment (EROI). Various measures of this index are declining. The EROI for China's oil and natural gas production sector fluctuated from 12 to 14:1 in the mid-1990s, and declined to 10:1 in 2007–2010. EROI for the coal production sector has declined from 35:1 in 1995–1997 to about 27:1 in 2010. We used a multi-cyclic generalized Weng model and a linear trend extrapolation method to predict that the EROI of either sector will continue to decline until 2020. We predict that the average $EROI_{stnd}$ for oil and natural gas extraction will be about 10:1 in 2015, 9:1 in 2020, and that for the coal production sector will be about 28:1 in 2015, 24:1 in 2020. EROI for coal extraction are and will continue to be higher than that for oil and natural gas extraction, indicating that coal is likely to continue being the most dominant fossil fuel

resource for China in the future, ensuring some degree of energy security.

Highlights

° We present a comprehensive analysis of EROI of fossil fuels production in China. ° The EROI of oil and gas extraction and coal production in China are declining. ° We use a multi-cyclic generalized Weng model and a linear trend extrapolation to predict future EROI and net energy. ° EROI for coal extraction are and will continue to be higher than that for oil and natural gas extraction.



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Keywords

China; EROI; Weng model; Peak production

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