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## Energy Efficiency Assessment of the Brazilian Pre-salt Petroleum

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### Abstract

The recent discoveries of petroleum storages located at Brazilian coast could push Brazil as an important player in the world energy sector. A large volume offshore petroleum reservoir was found close to Espírito Santo, Rio de Janeiro and São Paulo States; this reservoir is located in deep seawater (8km) after the pre-salt layer. Among others, due to all technological, economic, energetic, environmental and political issues regarding the extraction of this pre-salt petroleum creates challenges at the same time put uncertainties on the potential benefits obtained after its extraction. Focusing on energy issues, the large demand of materials and energy needed to extract the pre-salt petroleum raises doubts about its real energy benefit provided to society. This work assess the energy efficiency of petroleum extracted from the Brazilian pre-salt layer. Results shown an Energy Return on Investment (EROI) of 17.5; this indicates that for 1 Joule of fossil fuel invested on the pre-salt petroleum extraction would provide an average of 17.5 Joules of fossil fuel. This number points out a positive performance for the Brazilian pre-salt petroleum, which is similar to other systems as found in scientific literature; for instance, oil and gas production in China and Canada in 2010 with an EROI of 10 and 15 respectively, and a value from 0.8 to 10 to the ethanol from sugarcane.

**Keywords:** Embodied energy; EROI; Petroleum; Pre-salt layer.