

بيانات البحث رقم (5) المقدم للترقية

5				رقم البحث في القائمة المعتمدة
الحل الأمثل لنموذج رياضي متعدد الأهداف لتحديد مزيج توليد الكهرباء الديناميكي على مدار الساعة لتقليل انبعاثات ثاني أكسيد الكربون: دراسة حالة بدولة جنوب إفريقيا				عنوان البحث باللغة العربية
Multi-objective optimization of dynamic electricity generation-mix with CO ₂ reduction target: A case study of South Africa				عنوان البحث باللغة الانجليزية
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ملخص البحث باللغة الإنجليزية:

Carbone dioxide emissions is a global issue which has catastrophic consequences that beyond the universal climate change. Carbon emissions interact with other human demands on this planet, such as food, fibres, timber, and land for dwellings and roads. This paper presents a linear programming model for the optimal electricity generation-mix problem to meet a specified CO₂ emission target. The objective function minimizes the weighted sum of two terms: the electricity generation cost and the CO₂ emissions cost. Most of the electricity generation mix problem literature considers fixed and aggregated demand and capacity over the year. However, the electricity demand and generation capacity are dynamic parameters in hourly and/or daily basis. The proposed model contributes to the literature by modelling the hourly electricity demand, daily and hourly electricity generation capacity, and daily CO₂ emissions limit. The model is solved optimally with a case study derived based on the electricity sector 2030 plan in South Africa.

Results show that the proposed model proposes generation-mix plans that could achieve the CO₂ reduction target. Furthermore, electricity generation cost and CO₂ emissions are eliminated.