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Abstract: This paper proposes a practical approach for profit-based unit commitment (PBUC) with emission limitations. Under deregulation, unit commitment has evolved from a minimum-cost optimisation problem to a profit-based optimisation problem. However, as a consequence of growing environmental concern, the impact of fossil-fuelled power plants must be considered, giving rise to emission limitations. The simultaneous address of the profit with the emission is taken into account in our practical approach by a multiobjective optimisation (MO) problem. Hence, trade-off Curves between profit and emission are obtained for different energy price profiles, in a way to aid decision-makers concerning emission allowance trading. Moreover, a new parameter is presented, ratio of change, and the corresponding gradient angle, enabling the proper selection of a compromise commitment for the units. A case study based on the standard IEEE 30-bus system is presented to illustrate the proficiency Of Our practical approach for the new competitive and environmentally constrained electricity supply industry. (C) 2009 Elsevier Ltd. All rights reserved.

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