A modelling of geothermal resource's efficiency via data envelopment analysis

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Abstract: This research utilizes relational data envelopment analysis (DEA) to construct a model to analyze the efficiency of geothermal resources of the Biga Peninsula (Canakkale) in western Turkey. One input and two outputs are used in analysis, covering 9 geothermal resources. The results show that one geothermal source is efficient.

Keywords: data envelopment analysis (DEA), efficiency, geothermal source. **References:**

[1] R.D. Banker, A. Charnes, W.W. Cooper, Some models for estimating technical and scale inefficiencies in data envelopment analysis, Management Science, vol. 30, no. 9, pp. 1078-1092, 1984.

[2] A. Charnes, W.W. Cooper, E. Rhodes, Measuring the efficiencies of DMUs, European Journal of Operational Research, vol. 2, no. 6, pp. 429-444, 1978.

[3] G.R. Jahanshahloo, M. Khodabakhshi, Suitable combination of inputs for improving outputs in DEA with determining input congestion-considering textile industry of China, Applied Mathematics and Computation, vol. 151, no. 1, pp. 263-273, 2004.

[4] L. Shanling, G.R. Jahanshahloo, M. Khodabakhshi, A super-efficiency model for ranking efficient units in data envolepment analysis, Computational Optimization and Application, vol. 184, no. 2, pp. 638-648, 2007.

[5] F. Hosseinzadeh Lotfi, G.R. Jahanshahloo, M. Khodabakhshi, M. Rostamy-Malkhlifeh, Z. Moghaddas, M. Vaez-Ghasemi, A review of ranking models in data envelopment analysis, Journal of Applied Mathematics, vol. 2013, Article ID 492421, 20 pages, 2013.

[6] S. Mehrabian, A. Alirezaee, G.R. Jahanshahloo, A complete efficiency ranking of decision making units in DEA, Computational Optimization and Application, vol. 14, no. 2, pp. 261-266, 1999.

[7] J. Zhu, Quantitative Models for Performance Evaluation and Benchmarking, Operations Research and Management Science, Kluwer Academic Publishers, Boston, Dordrecht, London, 2003.

[8] W.W. Cooper, L.M. Seiford, K. Tone, Data Envelopment Analysis, Kluwer Academic Publishers, Boston, Dordrecht, London, 2004.