Table 2. Economic benefit before and after optimization in 5 companies.

	Unit Marginal Income (CNY/ MWh)		Marginal Income (million CNY)		Coal Consumption (kiloton)	
	Before Optimization	After Optimization	Before Optimization	After Optimization	Before Optimization	After Optimization
plant1	51.54	42.33	1394	877	9	7
plant2	54.96	60.57	2662	2704	16	15
plant3	47.04	51.63	5803	10873	35	60
plant4	34.47	12.39	3935	474	36	12
plant5	32.79	33.56	415	401	5	4
summary	43.63	47.06	14202	15332	101	98

Table **2** shows that after independent power generation optimization, total marginal income increased from 14.208 million CNY to 15.339 million CNY while coal consumption dropped from 1030 kiloton to 990 kiloton.

Therefore, considering the fact that China generated electricity 3896.5TWh using coal on an efficient rate of 331 g/kWh which consumes 127 million tons of coal, fully applying independent power generation optimization in the whole country could reduce coal consumption up to 10.2 million ton annually.

CONCLUSION

The method mentioned here can improve the current electricity generation method. Based on primary distribution of electricity generation, optimizing internal power generation plan within power company group can achieve minimum social resource consumption by allowing more electricity generated by the high efficiency generators. Independent power generation optimization requires no reformation on power system and no extra cost and has no negative effect on the grid safety and companies benefit from it. This method is beneficial to both, companies and the whole society, with high practicability and principle. Therefore, it is an important and effective way of promoting energy saving electricity generation control.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

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REFERENCES

[1] R.A. Jabr and B.C. Pal, "Intermittent wind generation in optimal power flow dispatching," *Generation, Transmission & Distribution, IET*, vol. 3, pp. 66-74, 2009.

[2] B. Zhang, W.C. Wu, and T.Y. Zhang, "Design of a multi-time scale coordinated active power dispatching system for accommodating large scale wind power penetration, " *Automation of Electric Power Systems*, vol. 35, no. 1, pp. 1-6, Jan. 2011.

[3] F. Kahrl, J. Williams, and J. Hu, "The political economy of electricity dispatch reform in China," *Energy Policy*, vol. 53, pp. 361-369, 2013.

[4] Y.C. Zhou, Y. Li, and B.B. Wang, "Impact of two dispatching methods on AGC unit dispatch in electricity market environment," *Power System Technology*, vol. 34, no. 7, pp. 154-159, Jul. 2010.

[5] S. Zhang, C.W. Taft, J. Bentsman, A. Hussey, and B. Petrus, "Simultaneous gains tuning in boiler/turbine PID-based controller clusters using iterative feedback tuning methodology," *ISA Transactions*, vol. 51, no. 5, pp. 609-621, 2012.

[6] T. Abrudan, J. Eriksson, and V. Koivunen, "Steepest descent algorithms for optimization under unitary matrix constraint", *IEEE Transactions on Signal Processing*, vol. 56, no. 3, pp. 1134-1147, Mar. 2008.

[7] Z. W. Gao, and H. Wang, "Descriptor observer approaches for multivariable systems with measurement and diagnosis," *Systems and Control Letters*, vol. 55, no. 4, pp. 304-313, 2006.

[8] H. Zhang, Y. Shi, and A.S. Mehr, "Robust static output feedback control and remote PID design for networked motor systems," *IEEE Trans Industrial Electronics*, vol. 58, pp. 5396-405, 2011.

[9] M. Basu, "Economic environmental dispatch using multi-objective differential evolution," *Applied Soft Computing*, vol. 11, no. 2, pp. 2845-2853, Mar. 2011.

[10] P. Mago, and L. Chamra, "Analysis and optimization of cchp systems based on energy, economical, and environmental considerations," *Energy and Buildings*, vol. 41, no. 10, pp. 1099-1106, 2009.

[11] M. Basu, "Economic environmental dispatch using multi-objective differential evolution," *Applied Soft Computing*, vol. 11, no. 2, pp. 2845-2853, Mar. 2011.

[12] H. Ren, and W. Gao, "Economic and environmental evaluation of microchp systems with different operating modes for residential buildings in Japan," *Energy and Buildings*, vol. 42, no. 6, pp. 853-861, 2010.

[13] J. Ma, "On-grid electricity tariffs in China: development, reformand prospects," *Energy Policy*, vol. 39, no. 5, pp. 2633–2645, 2011.

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