Table 5. Coal consumption rate of thermal units before and after wind power integration.

Scenarios	Unit (kg/MWh).									
	1	2	3	4	5	6	7	8	9	10
Including Wind Power	306	314	326	334	341	346	351	364	372	364
Excluding Wind Power	321	329	341	349	356	360	362	376	389	374

Combined units' consumption parameters, we calculate each unit's average generation coal consumption level under corresponding load factor respectively, as shown in Table **5**.

Combined Eq. (18), Eq. (22), we can solve thermal power units' average generation coal consumption rate under corresponding load level before and after to access to wind power respectively is 332.9 kg/MWh, 347.4 kg/MWh. According to Eq. (23), we can solve peaking auxiliary services fee of unit energy is 8.7 yuan/MWh. According to thermal power units' generation capacity 35274.8 MWh after access to wind power, wind power require a total payment 306.9 thousand yuan for thermal power units as peaking auxiliary services fee.

5.4. Reserve Service Financial Compensation Measure

After access to wind power to electricity system, under the goal of system profit maximization, wind power' average output is 826.7 MW, according to wind power and thermal power units 15% and 10% spare coefficient, electricity system new average spare capacity after access to wind power is 41.3 MW. According to thermal power units 4.2 million yuan/MW cost level and 1.85E-4 apportionment factor, wind power has to pay thermal power 12.1 thousand yuan reserve service fees in typical day.

CONCLUSION

Joint scheduling between general thermal power and wind power on generation side can slow down volatility of wind power output, but some environment policy of generation side will break the equilibrium of the existing market share, wind power get additional power quota with the advantage on its environment values, thus further solve wind power abandoned wind problem, but will affect the economic efficiency of general thermal power. On the base of analysis the impact of wind power to thermal power operation performance and the degree of thermal power participation peaking, the paper established thermal power auxiliary services economic compensation model based on objective optimization methods. The cooperation between wind power and thermal power on the generation side can improve the level of wind power consumptive through cases considered, and further expand the use efficiency of wind power units. At the same time, the economic compensation mechanism can protect the economic profit of thermal power units effectively.

CONFLICT OF INTEREST

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

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