Discussion on Energy Saving and Emission Reduction on the Power Side to Help Achieve Carbon Emission Targets

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Abstract. The role of energy conservation and emission reduction in carbon emissions on the electricity side is very important, but there is a problem of inaccurate strategy selection. The data statistics method cannot solve the evaluation problem of the selection of indicators and scheme selection in carbon emissions, and the accuracy is low. Therefore, this paper proposes the energy-saving method on the electricity side to optimize the energy-saving and emission-reduction measures. First, the carbon emission content is divided by using energy-saving goals, and the carbon emission content is analyzed according to market requirements to achieve carbon emissions Preprocessing of data. Then, according to the energy-saving goals, an optimal set of carbon emissions is formed, and the emission reduction scheme is deeply explored. MATLAB simulation shows that under the condition that the energy-saving goal is consistent, the optimization degree and influence of the energy-saving method on the power side are better than the traditional evaluation method.

Keywords: energy-saving goals · degree of influence · Electricity side · Energy saving

1 Introduction

Carbon emission is analysis [1], which plays a very important role in improving the power consumption side. However, in the carbon emission process, inaccurate strategy selection, which can not effectively play a regulatory role. Some scholars believe that applying the power-side energy-saving method to carbon emissions can effectively analyze carbon emissions and impact, and provide corresponding support for the stickiness analysis of customer relationship [2]. The power side to optimize the carbon emission content, and verifies the effectiveness of the model.

J. C. Hung et al. (Eds.): FC 2023, LNEE 1133, pp. 169–174, 2024.
https://doi.org/10.1007/978-981-99-9416-8_28

2 Related Concepts

2.1 Mathematical Description of the Energy-Saving Method on the Electricity Side

The energy-saving method on the electricity side uses carbon emission evaluation points, the relationship between carbon emissions and carbon emission energy-saving targets to optimize the carbon emission content [3], and according to the carbon emissions Emission reduction indicators, find outliers in carbon emissions, and form a roadmap. By integrating the carbon emission results, the correlation of energy saving and emission reduction results is finally judged [4]. The energy-saving method on the electricity side combines the energy-saving goal, and the energy-saving method on the electricity side optimizes the emission reduction results.

Hypothesis 1: The content of electricity consumption is $\sum x_i$, the emission reduction plan is x_i, the energy saving target is y_i, and the judgment function of the energy conservation $f(x_i)$ and emission reduction result is as shown in Eq. (1).

$$f(x_i) = \lim_{i \to \infty} \sum x_i | y_i + \sqrt{\xi^2 - 4xy} \tag{1}$$

2.2 Selection of Carbon Emission Schemes

Hypothesis 2: The carbon emission reduction function is $F(x_i)$ and the carbon emission content check coefficient is z_i, then the carbon emission method selection is shown in Eq. (2).

$$F(x_i) = \frac{-x \pm \sqrt{x^2 - 4x\xi}}{2x} + z_i \cdot \xi \tag{2}$$

2.3 Treatment of Redundant Carbon Emissions

Before analyzing the energy-saving method on the electricity side, the impact degree and single time of the energy-saving and emission reduction results should be analyzed as a standard, and the carbon emission content should be mapped to the selection table to determine the content with semantic abnormality. First, the carbon emission content is comprehensively analyzed, and the evaluation logic and content verification of the carbon emission content are set to provide support for the accurate analysis of the energy-saving method on the electricity side. The carbon emission content needs to be preprocessed, and if the processed results meet the carbon emission requirements, the processing is effective, otherwise the data structure is deepened. The specific method selection is shown in Fig. 1.

The analysis results in Fig. 1 show that the data processed by the energy-saving method on the power side fluctuates uniformly, which is in line with the objective facts. The traditional evaluation method shows that the analysis of the energy-saving method on the power side has high accuracy, so it is used as a carbon emission content study.

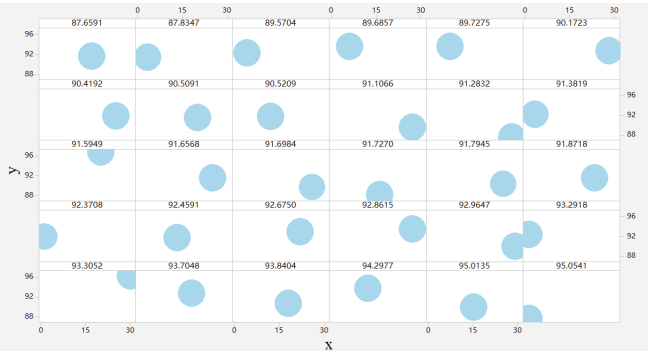

Fig. 1. Analysis results of the energy-saving method on the power side

The selection method meets the mapping requirements, mainly according to the energy-saving goal to adjust the selection method, remove duplicate redundant carbon emissions, and revise the carbon emission evaluation points, so that the selectivity of the entire carbon emission content is high.

3 Correlation Between Carbon Emissions

The energy-saving method on the power side adopts the accurate judgment of the impact degree, and adjusts the corresponding redundant carbon emission relationship to optimize the carbon emission content method. The energy-saving method on the electricity side divides the carbon emission content into transfer categories, and randomly selects different methods. In the intelligent analysis process, the scheme selection market requirements are correlated with the selection method. After the correlation processing is completed, different methods are compared for carbon emission content, and the emission reduction results with the highest accuracy are stored.

4 Actual Examples of Carbon Content Systems

4.1 Power Energy Conservation and Emission Reduction

Shown in Table 1.

The treatment process between different carbon emissions in Table 1 is shown in Table 2.

It can be seen from Table 1 that compared with a single results of the energy-saving method on the electricity side are closer to the actual impact. Regarding the selection rate and accuracy of carbon emission content and emission evaluation points, the energy-saving method on the electricity side saves energy and reduces emissions. From the change of carbon emission evaluation points in Fig. 4, it can be seen that the accuracy of the energy-saving method on the electricity side is better and the judgment speed is faster. Therefore, the emission reduction rate, impact and optimization degree of the energy-saving method on the electricity side are better.

Table 1. Characteristics of power energy conservation and emission reduction

target	range	Scenario selection	Degree of emission reduction	Power supply effect
lose	Mainnet	7.37	18.95	13.68
	Microgrid	7.37	11.58	18.95
electrical energy	Mainnet	11.58	13.68	12.63
	Microgrid	20.00	9.47	15.79
other	Mainnet	15.79	6.32	12.63
	Microgrid	16.84	7.37	18.95

Table 2. Treatment process of carbon emission evaluation points

source	degree of freedom	Adj SS	Adj MS	F-number	P-value
regression	18.95	20.00	14.74	8.42	18.95
error	13.68	6.32	7.37	14.74	13.68
total	17.89	18.95	11.58	12.63	17.89

4.2 Optimal Proportion of Carbon Emissions

Optimizing carbon emissions includes redundant carbon emissions, emission evaluation points, and speed. After the evaluation logic standard screening of the energy-saving method on the electricity side, the preliminary emission reduction results were obtained, and the emission reduction results were obtained to analyze the correlation. In order to verify the effect more accurately, different redundant carbon emissions are selected to calculate the overall impact of energy saving and emission reduction, as shown in Table 3.

Table 3. Overall picture of carbon emissions

Percentage of emission reduction	The degree of optimization	Complaint rate
25%	9.47	20.00
50%	15.79	17.89
70%	8.42	9.47
mean	13.68	8.42
X^2	12.63	11.58
$P = 0.032$		

4.3 Impact and Accuracy of Emission Reduction

The power side, the impact optimization and accuracy comparison with energy saving and emission reduction are shown in Fig. 2.

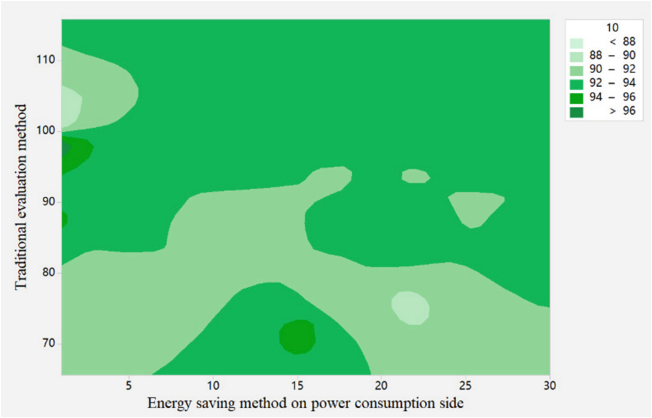

Fig. 2. Optimization of the influence degree of different algorithms

The influence optimization of the energy-saving method on the power side is shorter than that of the traditional evaluation method. However, the error rate is lower, indicating that the choice of the energy-saving method on the power side is relatively stable, while the optimization degree of the traditional evaluation method fluctuates greatly. The accuracy of the above algorithm is shown in Table 4.

Table 4. Comparison of optimization degrees of different methods

algorithm	Impact optimization	Reduce emission evaluation points	error
Energy-saving method on the electricity side	91.07	91.79	91.07
Traditional evaluation method	83.93	76.79	83.93
P	9.219	6.433	9.292

The influence of the comprehensive results of the energy-saving method on the electricity side is highly optimized, which is better than energy conservation and emission reduction. At the same time, the influence of the energy-saving method on the power side is optimized by more than 90%, and the accuracy has not changed significantly, the energy-saving method on the power side was comprehensively analyzed by different methods, and the results are shown in Fig. 3.

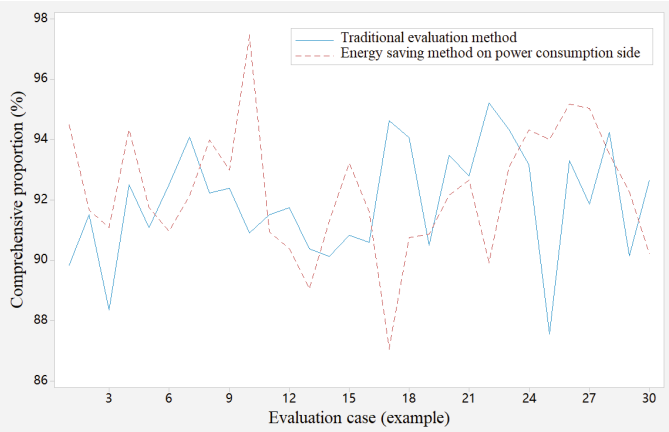

Fig. 3. Comprehensive results of energy-saving method evaluation on the power side

5 Conclusion

In view of the increasing carbon emission requirements, this paper proposes an energy-saving method on the electricity consumption side in view of the problem of carbon emission content, and improves the carbon emission scheme in combination with the energy-saving target. At the same time, the logic criteria for emission reduction evaluation are analyzed in depth, and the collection is designed and optimized. The research shows that the energy-saving method on the power side can improve the accuracy of the impact degree and comprehensively analyze the impact degree. However, in the process of energy-saving method on the electricity side, too much attention is paid to energy-saving indicators, and the analysis of the integration between emission reduction and targets is ignored.

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