Table S1. Research and reference on industrial structure and energy consumption structure evaluation index

	Researchers	**Selection indicator**	**Whether to learn from and explanation**
Evaluation of industrial structure	Wu (2008) Gan et al. (2011) Han et al. (2016)	Tertiary industry output value/secondary industry output value	Yes, as the coefficient of industrial structure evolution
	Wang et al. (2016)	Tertiary industry output value/GDP	Yes
	Wang et al. (2016)	Secondary industry output value/GDP	Yes
	Wang (2013)	Output value of different industries	No, absolute quantity, it is difficult to reflect the structure
	Wang (2013)	Industrial carbon intensity (CO_2 emissions/output value)	Yes
Evaluation of energy structure	Liobikienė and Butkus (2017)	Renewable energy/total energy consumption	Yes
	Wang et al. (2016)	Non-renewable energy/total energy consumption	No, considering the limitation of nuclear energy, the proportion of fossil energy is extended.
	Wang et al. (2016)	Fossil energy/total energy consumption	Yes
	Wang et al. (2016)	Different types of energy consumption	No, absolute quantity, it is difficult to reflect the

			structure
	Wang et al. (2016)	Unit energy output value	No, but the reference is changed to CO_2 emissions per unit of energy consumption

Table S2. Industrial structure requires energy structure synergistic order fitting.

model		Non-standard coefficient		Standard coefficient		
		B	Standard error	trial version	t	Sig.
1	(constant)	0.269	0.048		5.653	0.000
	Energy structure order	17.896	2.690	0.811	6.652	0.000

Note: Dependent variable: industrial structure order.

Table S3. Energy structure requires industrial structure synergistic order fitting.

model		Non-standard coefficient		Standard coefficient		
		B	Standard error	trial version	t	Sig.
1	(constant)	-0.006	0.003		-1.758	0.092
	Industrial structure order	0.037	0.006	0.811	6.652	0.000

Note: Dependent variable: energy structure order.

Text S1

(1) Standardizing raw data

To overcome the problems caused by the difference in physical meaning and dimension of the data, the raw data are first standardized and preprocessed. The z-score method is used here, and the calculation method is as follows:

We set the j-th indicator of the i-th year to be x_{ij}, where $i=1,2,\cdots,n, j=1,2,\cdots,p$, and let $\overline{x_j}$ be the mean of the j-th indicator; and the expression is as follows:

$$i\overline{x_j}=\frac{1}{m}\sum_1^m x_{ij} \tag{B1}$$

We calculate the sample standard deviation S_j of the j-th indicator:

$$S_j=[\frac{1}{m-1}\sum_1^m(X_{ij}-\overline{X_j})^2]^{\frac{1}{2}} \tag{B2}$$

The standardized data are:

$$ZX_{ij}^{'}=\frac{X_{ij}-\overline{X_j}}{S_j} \tag{B3}$$

(2) Correlation coefficient matrix R

We calculate the correlation coefficient matrix $R=(r_{ik})_{nn}$ of the standardized indicators, where:

$$r_{jk}=\frac{1}{m-1}\mathrm{g}\frac{X_{ij}-\overline{X_j}}{S_j}\mathrm{g}\frac{X_{ik}-\overline{X_k}}{S_k}-\frac{1}{m-1}\sum_1^m zx_{ij}\cdot zx_{ik},\ j,k=1,2,\cdots,n \tag{B4}$$

and $r_{ij}=1, r_{ik}=r_{ki}$.

(3) Determining the principal component

The indicator contribution rate and the cumulative contribution rate are calculated, respectively, according to the following formulas:

$$T_k=\frac{\lambda_k}{\sum_{j=1}^k T_j} \tag{B5}$$

$$D_k = \sum_{j=1}^{k} T_j \tag{B6}$$

We choose p principal components corresponding to $D_k \geq 85\%$ and characteristic root $\lambda_1, \lambda_2, \cdots, \lambda_p (p > n)$, and utilize it as an indicator to evaluate the industrial structure subsystem and the energy consumption structure subsystem.

According to the mathematical relationship between the principal component load matrix M, the factor load matrix A, and the eigenvalue λ, the relationship between the principal component and the original variable is restored, and the relationship is as follows:

$$M_k = \frac{A_k}{\sqrt{\lambda_k}} \tag{B7}$$