

Innovation of the Planning for the Factors Relating to the Cost of Electricity Capacity on Surin Province, Thailand: A Sectoral Approach

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Abstract

This study aims to analyse the cost of electricity capacity in five districts of Surin Province under the control of PEA Surin Province, based on seven electricity user sectors, to create guidelines for the long-term administration planning of electricity capacity in 2026. Seven electricity user sectors are explored: residential, small size business, medium size business, industrial, specific business, agricultural, and other sectors, based on the total forecasted electricity consumption, including loss for each sector and the income statement of the PEA Surin Province for the year ending 31 December 2021. The average electricity sales price per kWh for the seven electricity user sectors is obtained using the joint cost allocation, calculated according to the relative sales value and cost behaviour analysis concept, applying the average variable cost, breakeven point (BEP) analysis, comparison between total forecasted electricity consumption and electricity capacity, and sensitivity analysis, respectively. The results of this study indicate that the PEA Surin Province should formulate three suitable guidelines for the administration planning of electricity capacity. Firstly, the amount of $(AVTFC_i)$ should reflect the change in (TFC_s) in all seven electricity user sectors. Similarly, the administration planning of electricity capacity for the (AVC_i) should involve an increase in (TVC_s) of each type for all seven electricity user sectors. According to the guidelines for the administration planning of electricity capacity in terms of (P_i) , the rate charged for all seven electricity user sectors should be reduced. The implementation of these three guidelines for the administration planning of electricity capacity will result in the PEA Surin Province having sufficient electricity capacity to support the increase in total electricity consumption for each of the seven electricity user sectors in 2026 for the five districts of Surin Province.

Keywords: Cost of electricity capacity, Sectoral approach, Provincial Electricity Authority Surin Province, Electricity administration planning, Energy economics

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Introduction

The aim of this study is to develop guidelines for the planning and administration of electricity capacity in five districts of Surin Province, Thailand, based on seven electricity user sectors by considering the results of a previous study Kidroub, P. & Kumjinda, S. (2022). The total electricity consumption, including loss in the five districts of the PEA Surin Province, is compared with the estimated electricity capacity (or distribution). The electricity capacity for distribution to the five districts of the PEA Surin Province tends to fluctuate. It is forecast to increase each year from 2022 to 2026 at the rate of 2.67, 4.76, 6.47, 7.84, and 8.93 million kWh, respectively. The PEA Surin Province has a tendency to produce a surplus, although at a decreasing rate. It can therefore be assumed that the electricity situation in the five districts of Surin Province under control of PEA Surin Province is likely to be unstable.

This study describes the electricity capacity in five districts of Surin Province under the control of PEA Surin Province in order to find a suitable plan for ensuring the electricity capacity can catch up and meet the forecasted electricity consumption in 2026 in each of the seven electricity user sectors, to allow for future changes in society and the economy. The electricity consumption of each sector needs to be effectively administered to meet the electricity needs of the entire Surin Province. In addition, information is required on the expenses of the PEA Surin Province in terms of total fixed costs (TFC_s) and total variable costs (TVC_s). This information could be used to determine the strategy and electricity capacity (or electricity distribution) of the PEA Surin Province for all sectors in the future. Although the effective administration of the electricity capacity in the PEA Surin Province is likely to take between two and four years, it is essential that the electricity capacity is analysed to create a suitable electricity administration plan and policy to efficiently meet the forecasted electricity consumption, including loss in 2026 for each of the seven electricity user sectors. Consequently, a forecast of the electricity consumption is required to estimate the future electricity usage, the degree of the electricity consumption increase within a particular

area, and consumer consumption for use in the future electricity development plans of five districts in Surin Province under the control of the PEA Surin Province.

Accordingly, this study has two objectives. Firstly, to find a solution, and secondly, to develop and set guidelines for the administration planning for the cost of electricity capacity in five districts of Surin Province, Thailand, based on seven electricity user sectors.

Objectives

1. To study the cost of electricity capacity in five districts under the responsibility of the PEA Surin Province in 2021
2. To create new management guidelines for the five districts under the responsibility of the PEA Surin Province concerning long-term management planning for electricity capacity (or electricity distribution).

Framework

As previously mentioned in the introduction, the statement of the problem forms the basis of the study framework and is divided into two parts. In the first part, the total forecasted electricity consumption (or consumption dimension) is forecast over the five years between 2022 and 2026 for seven electricity user sectors of the PEA Surin Province: residential, small size business, medium size business, industrial, specific business, agricultural, and other, employing the results from previous studies Kidroub, P & Kumjinda, S. (2022). In the second part, the cost of electricity capacity in 2021 (or distribution dimension) of the PEA Surin Province, based on the seven electricity user sectors, is analysed according to total fixed costs (TFC_s), Total variable costs (TVC_s), average electricity sales price per kWh (P_i), breakeven point (BEP), and sensitivity analysis in order to assess the ability of the PEA Surin Province to find a suitable breakeven point for electricity administration in each sector. The results of this study form the basis of the Guidelines for Administration Planning Innovation for the Cost of Electricity Capacity in Five Districts of Surin Province, Thailand, Based on Seven Electricity User Sectors in the future (2026). Figure 1 presents the framework of this study.

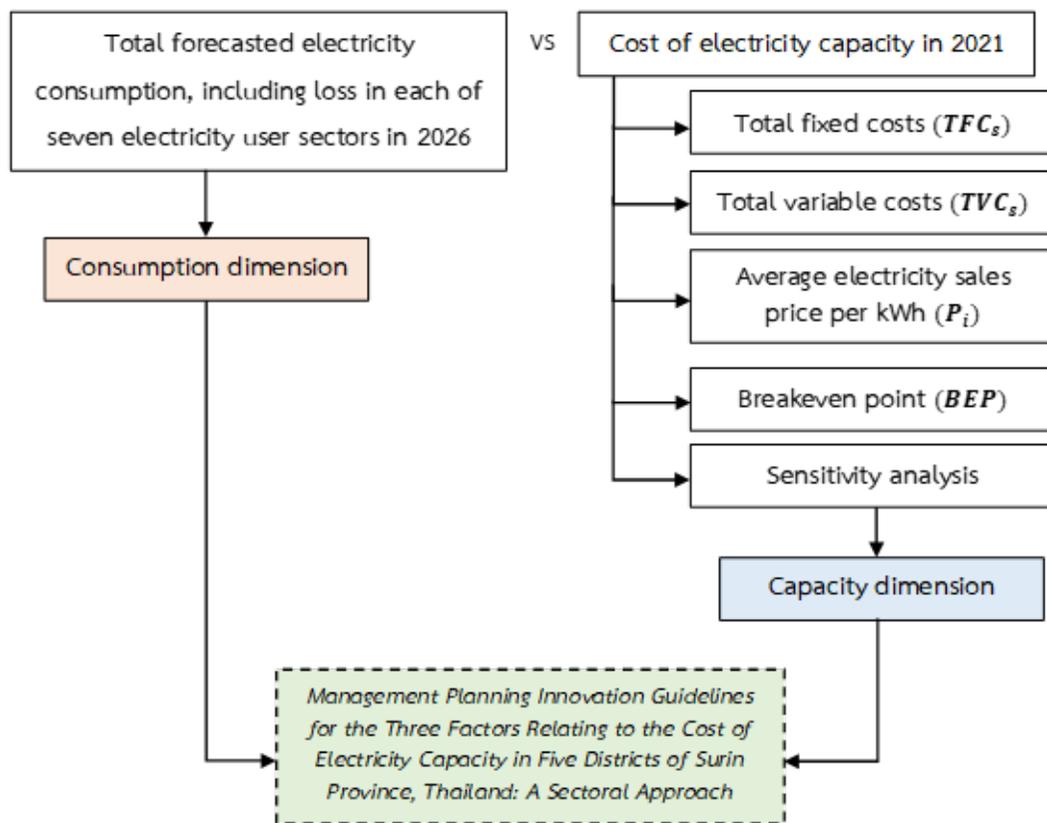


Figure 1. Framework

Source. Author's construction, adapted from Kumjinda, S. (2020)

Data and methodology

In this study, the data and methodology are divided into two dimensions: consumption and capacity, in order to be consistent with the framework.

Consumption dimension

Data collection

The data on the total electricity consumption, excluding loss, has been obtained from the results of a previous study, as detailed in Table 4 Kidroub, P & Kumjinda, S. (2022). Table 1 provides a summary of the total electricity consumption, excluding loss, taken from the previous study results set out in Table 1.

Table 1. Forecasted electricity consumption, excluding loss for each of the seven electricity user sectors

Forecast period	Residential	Small size business	Medium size business	Industrial	Specific business	Agricultural	Other
2022	217.21	79.41	99.84	57.27	5.46	1.85	2.67
2023	226.50	81.81	102.09	54.71	4.52	1.91	2.43
2024	235.78	84.22	104.34	52.44	3.68	1.97	2.19
2025	245.07	86.62	106.59	50.41	2.92	2.03	1.95
2026	254.36	89.02	108.84	48.61	2.23	2.09	1.71

Note. Unit is million kilowatt hour (kWh)

Source. Kidroub, P. & Kumjinda, S. (2022).

Data analysis

According to Table 1, the data on forecasted electricity consumption, excluding loss, in each of the seven electricity user sectors is used to forecasted electricity consumption, including loss, using non-technical loss (Policy and Strategy Department, PEA Head Office, 2018). When the forecasted electricity consumption, in-

cluding loss for each of the seven electricity user sectors, is complete, the figures can be presented in Table 2. The authors have specifically chosen only the data for forecasted electricity consumption, including loss in 2026, to find the quantity of electricity capacity required to catch up with the forecasted electricity consumption, including loss in 2026.

Table 2. Forecasted electricity consumption, including loss for each of the seven electricity user sectors

Forecast period	Residential	Small size business	Medium size business	Industrial	Specific business	Agricultural	Other
2022	221.55	82.58	104.83	58.99	7.15	2.44	2.94
2023	231.03	85.08	106.17	56.35	5.97	3.78	2.75
2024	238.14	87.58	107.47	53.49	4.89	5.90	2.52
2025	247.52	90.08	109.79	50.91	3.91	8.92	2.27
2026	256.90	91.70	111.02	49.09	2.99	12.85	2.02

Note. Unit is million kilowatt hour (kWh).

Source. Authors' calculation

Capacity dimension**Data collection**

The data collected from the General Accounting Section, PEA Surin Province, 2022, is used for analysing the cost of electricity capacity (or cost of electricity distribution) and comprises two parts.

1. Income statement of the PEA Surin Province

The income statement of the PEA Surin Province for the year ending 31 December 2021 is used in this study, selecting only the specific costs involved in electricity capacity: 1) Total fixed costs (TFC_s), and 2) Total variable costs (TVC_s), collected from the General Accounting Section, PEA Surin Province, 2022, as shown in Table 3.

Table 3. Total fixed costs (TFC_s) and total variable costs (TVC_s) taken from the income statement of the PEA Surin Province for the year ending 31 December 2021

Costs of electricity capacity	Million baht
1) Total fixed costs	51.7928
2) Total variable costs	2,593.6422
Total	2,645.4350

Source: General Accounting Section, PEA Surin Province (2022)

Data analysis

According to Table 3, the total fixed costs (TFC_s) and total variable costs (TVC_s) of the PEA Surin Province for the year ending 31 December 2021 are considered using four methods: 1) Cost allocation calculated in the form of relative sales value; 2) Cost behaviour analysis concept; 3) Breakeven point (BEP) analysis; and 4) Sensitivity analysis, the details of which are as follows:

1. Cost allocation calculated according to the relative sales value

When considering the three factors in the BEP analysis equation to calculate the BEP level in each of the seven electricity user sectors, not all could be applied to the seven sectors. Therefore, the cost allocation method is used to classify both the total fixed costs (TFC_s) and total variable costs (TVC_s) of the seven electricity user sectors. The cost allocation in the form of relative sales value refers to the joint costs associated with production based on the sales price of each product type. The costs involved in such a production process utilise joint resources. This method assumes that a high sales price for each product will reflect the high production cost, and a low sales price has a low production cost (Periasamy, 2010).

When considering joint cost allocation in the context of the PEA Surin Province, this method was found to be suitable and consistent for classifying the cost of electricity capacity in each sector since electricity capacity classification depends on the type of product distributed to a particular consumer group. Therefore, the joint cost allocation method is adopted from the study of Periasamy (2010) to specify or classify the cost of electricity capacity in each sector to find the breakeven point (BEP) for the seven electricity user sectors in PEA Surin Province. Details of the joint cost allocation, calculated according to the relative sales value, are shown in the following equation.

$$JCA_i = \frac{SV_i}{TQ_i} \times JC_i \quad (1)$$

Where: JCA_i is the joint cost allocation value of the electricity capacity for each of the seven electricity user sectors. JC_i are the joint total fixed costs (TFC_s) and

total variable costs. SV_i is the sales value (P_i × Q_i); and Q_i is the level of electricity capacity for the PEA Surin Province in 2021. TQ_i is the level of electricity capacity.

After applying the cost allocation according to the relative sales value, the cost of electricity capacity for the seven electricity user sectors under the responsibility of the PEA Surin Province can be divided into total fixed costs (TFC_s) and total variable costs (TVC_s). To identify the TFC_s and TVC_s for each of the seven electricity user sectors for use in the BEP analysis equation to satisfy the first objective, the level of electricity capacity for distribution by the PEA Surin Province to the seven electricity user sectors and the BEP in 2021 must be ascertained. The BEP analysis method is explained in the following section.

2. Cost behaviour analysis concept

This study uses cost behaviour analysis to calculate the total variable cost (TVC_s) in the form of average variable cost (AVC) for use in the BEP analysis equation.

2.1 Average variable cost (AVC)

The total variable costs (TVC_s) can be calculated by using the average variable cost (AVC) factor for each of the seven electricity user sectors in the following AVC_i equation, adopted from Panpon (2016).

$$AVC_i = \frac{TVC_i}{Q_i} \quad (2)$$

Where: AVC_i is the average variable cost for each of the seven electricity user sectors. TVC_i is the total variable cost for each of the seven electricity user sectors. Q_i is the total quantity of electricity capacity available for distribution by the PEA Surin Province in 2021.

3. Breakeven point (BEP) analysis

Breakeven (BEP) analysis refers to the point at which the total revenue is equal to the total cost, representing the difference between the volume of production and existing production capacity (Salvatore, 2012).

In this study, BEP analysis equation is used to satisfy the study objectives. The BEP of the electricity

capacity for PEA Surin Province in 2021 must be analysed to formulate guidelines and plans for the effective administration of electricity capacity by the PEA Surin Province in order to satisfy the study objectives. The BEP is a flexible tool for analysing the effects of changing conditions in the PEA Surin Province and can also be performed and applied from the work of Salvatore (2012) as in the following equation.

$$Q_{Bi} = \frac{AVTFC_i}{(P_i - AVAVC_i)} \quad (3)$$

Where: Q_{Bi} is the BEP or electricity capacity at the BEP level of each of the seven electricity user sectors. $AVTFC_i$ is the allocation value of TFC_s for each of the seven electricity user sectors. P_i is the average electricity sales price per kWh for each of the seven electricity user sectors. $AVAVC_i$ is the allocation value of AVC_i for each of the seven electricity user sectors.

Three BEP factors are analysed to determine the effect of one or more changes on the electricity capacity at the BEP level in 2026 and how it can catch up with and meet the forecasted electricity consumption of the seven electricity user sectors in the PEA Surin Province in 2026.

4. Comparison between total forecasted electricity consumption and electricity capacity

The BEP is determined as the electricity capacity of the seven electricity user sectors in accordance with the study objectives. Since electricity is non-renewable energy and cannot be stored, demand should equal supply. Therefore, the economics of electricity supply theory by Attavanich (2014) is applied in this study, namely:

$$TEC_i = Q_{Bi} \quad (4)$$

Where: TEC_i is total forecasted electricity consumption, including loss of each of the seven electricity user sectors. Q_{Bi} is electricity capacity of each of the seven electricity user sectors.

In the next step, the sensitivity analysis is used to establish the effect of changes in the three factors of the BEP analysis equation. Details of the sensitivity

analysis are explained in the following section.

5. Sensitivity analysis

The cost structure of the PEA Surin Province is expected to change over time. Therefore, the guidelines for the administration planning of electricity capacity must carefully consider such change to maintain profitability. To satisfy the second objective, sensitivity analysis is applied to the shift in $AVTFC_i$ is the allocation value of TFC_s for each of the seven electricity user sectors, P_i is the average electricity sales price per kWh for each of the seven electricity user sectors. $AVAVC_i$ is the allocation value of AVC_i for each of the seven electricity user sectors, following the method applied by Walther and Skousen (2009). It is also necessary to ensure consistency with the real situation where different factors change all the time. Therefore, three-way sensitivity analysis is chosen for this study, whereby all three variables on the BEP analysis equation are varied together. These three conditions could be applied to analyse the seven electricity user sectors to formulate the guidelines for the effective administration planning of electricity capacity.

The analysis methods mentioned in this study have been used to estimate the cost of electricity to satisfy the study objectives. However, in fact, the electricity sales price is determined by the Energy Regulatory Commission, Ministry of Energy. Therefore, the BEP analysis equation is only used on the first and third conditions. After applying all analysis methods, the following results can be displayed.

Results and discussion

The details of the results and discussion can be divided into two parts: 1) cost of electricity capacity analysis; and 2) guidelines for the PEA Surin Province's long-term administration planning of electricity capacity.

1. Joint cost allocation method in the form of relative sales value

The total fixed cost (TFC_s) and total variable cost (TVC_s) are classified into seven electricity user sectors using the joint cost allocation method in the form of relative sales value. The results reveal that the allocation value of (TFC_s) or ($AVTFC_i$) factor for each of

the residential, small size business, medium size business, industrial, specific business, agricultural, and other sectors equate to 24.8303, 9.7215, 9.8871, 6.1993, 0.5936, 0.1576, and 0.4034 million baht, respectively, while the is the allocation value of AVC_i or $(AVTFC_i)$ fac-

tor for each of the seven electricity user sectors equate to 1,243.4350, 486.8243, 495.1202, 310.4458, 29.7240, 7.8903, and 20.2026 million baht, respectively, as presented in Table 4.

Table 4. The results of joint cost allocation in the form of relative sales value in each of the seven electricity user sectors

Sectors	Joint costs allocated to each of the seven electricity user sectors	
	$AVTFC_i$	$AVTVC_i$
1) Residential	24.8303	1,243.4350
2) Small size business	9.7215	486.8243
3) Medium size business	9.8871	495.1202
4) Industrial	6.1993	310.4458
5) Specific business	0.5936	29.7240
6) Agricultural	0.1576	7.8903
7) Other	0.4034	20.2026
Total	51.7928	2,593.6422

Note: $AVTFC_i$ is allocation value of TFC_s . $AVTVC_i$ is allocation value of TVC_s . Unit is million baht.

2. Cost behaviour analysis concept

According to Table 4, only $AVTFC_i$ and $AVTVC_i$ can be used as factors for each of the seven electricity user sectors. But, no AVC factor has so far been identified for each of the seven electricity user sectors since the BEP equation contains three components, namely $AVTFC_i$, $AVTVC_i$, and P_i , as presented in Equation 3. Therefore, it is necessary to identify the AVC_i factor in each of the seven electricity user sectors for use in the breakeven point (BEP) analysis equation to find the breakeven point (BEP) of each sector.

The results of the AVC_i calculation reveal that the AVC_i values for residential, small size businesses, medium size businesses, industrial, specific businesses, agricultural, and other sectors are shown in Table 5.

Table 5: Average variable costs of seven sectors

Sectors	$AVC_i = \frac{AVTVC_i}{Q_i}$
1) Residential	2.7387
2) Small size business	1.0723
3) Medium size business	1.0905
4) Industrial	0.6838
5) Specific business	0.0655
6) Agricultural	0.0174
7) Other	0.0445

Note: $AVTVC_i$ refers to the allocation value of total variable costs in units of million baht. Q_i is the quantity of electricity capacity in units of million (kWh), based on the economics of electricity supply theory proposed by Attavanich (2014). Therefore, Q_i is the quantity of electricity consumption or level of electricity capacity of the PEA Surin Province in 2021. AVC_i refers to the average variable costs of seven electricity user sectors in units of baht per kWh.

According to $AVTFC_i$ and AVC_i factors for each of the seven sectors shown in Tables 5 and 6, including (P_i) factors obtained from the General Accounting Section, PEA Surin Province (2022), it can be concluded that

three factors can be used in the BEP analysis equation for each of the seven electricity user sectors, consisting of $AVTFC_i$, AVC_i , and P_i . All three variables are shown in Table 6.

Table 6. Three factors in the BEP analysis equation for each of the seven sectors in 2021

Sectors	Three factors in the BEP analysis equation		
	$AVTFC_i$	AVC_i	P_i
1) Residential	24.8303	2.7387	3.7364
2) Small size business	9.7215	1.0723	3.9501
3) Medium size business	9.8871	1.0905	3.1698
4) Industrial	6.1993	0.6838	3.1698
5) Specific business	0.5936	0.0655	3.4327
6) Agricultural	0.1576	0.0174	2.6647
7) Other	0.4034	0.0445	4.1249

Note: $AVTFC_i$ refers to the allocation value of TFC_s for each of the seven sectors in units of million baht. AVC_i refers to refers to the average variable costs of seven electricity user sectors in units of baht per kWh. P_i is the average electricity sales price per kWh in each of the seven sectors.

3. Breakeven point analysis

In Table 7, three variables from the BEP analysis equation are used to identify the BEP values or the electricity capacity at BEP level of the PEA Surin Province in 2021 for seven sectors to answer the objective

of this study. The BEP results reveal that in 2021, the electricity capacity at the BEP level of the PEA Surin Province for the seven sectors shows neither profit nor loss, as demonstrated in Table 7.

Table 7. The results of BEP analysis calculation for each of the seven electricity user sectors

Sectors	Three factors in the BEP analysis equation
	$Q_{Bi} = \frac{AVTFC_i}{(P_i - AVC_i)}$
1) Residential	24.8875
2) Small size business	3.3781
3) Medium size business	4.7550
4) Industrial	2.4937
5) Specific business	0.1763
6) Agricultural	0.0595
7) Other	0.0989

Note: $AVTFC_i$ is shown in million baht. AVC_i and P_i are presented in baht per kWh.

4. Comparison between total forecasted electricity consumption, including loss in 2026 and the electricity capacity at BEP level in 2021

After BEP analysis, the authors used the economics of the electricity supply concept proposed by Attavanich (2014), who stated that since electricity is non-renewable energy, it cannot be stored and demand should equal supply, as shown in Equation 4. Therefore, it can be assumed that the total forecasted electricity consumption, including loss in 2026 is equal to electric-

ity capacity at BEP level in 2021, as presented in Figure 2.

The results of a comparison between total forecasted electricity consumption, including loss in 2026 (Table 2) and electricity capacity at BEP level in 2021 (Table 7), indicate that the differences in each of the seven electricity user sectors equate to 232.0125, 88.3219, 106.2650, 46.5963, 2.8137, 12.7905, and 1.9211 million kWh, respectively, as demonstrated in Table 8.

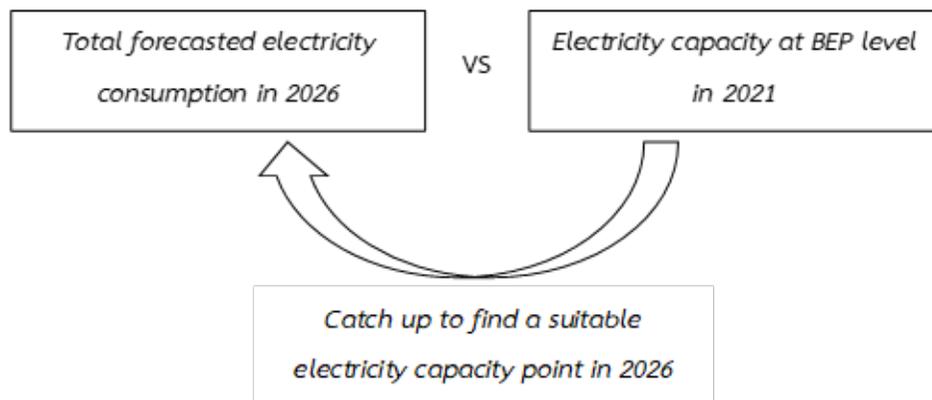


Figure 2. Comparison between total forecasted electricity consumption, including loss in 2026 and electricity capacity at BEP level in 2021

Note: Author’s construction

Table 8. The results of a comparison between total forecasted electricity consumption, including loss in 2026 and electricity capacity at BEP level in 2021

Sectors	Total forecasted electricity consumption, including loss in 2026	Electricity capacity at BEP level in 2021	Quantity of electricity Capacity required to catch up with electricity consumption
	(1)	(2)	(1) > (2)
1) Residential	256.90	24.8875	232.0125
2) Small size business	91.70	3.3781	88.3219
3) Medium size business	111.02	4.7550	106.2650
4) Industrial	49.09	2.4937	46.5963
5) Specific business	2.99	0.1763	2.8137
6) Agricultural	12.85	0.0595	12.7905
7) Other	2.02	0.0989	1.9211

Source: Author’s calculation

Note: Unit is million kilowatt per hour (kWh).

According to Table 8, the values of the total forecasted electricity consumption, including loss in 2026 for each of the seven electricity user sectors, are higher than the electricity capacity at BEP level in 2021. It could be said that the electricity capacity at BEP level in 2021 for each of the seven electricity user sectors in five districts of Surin Province (or under the responsibility of the PEA Surin Province) is not sufficient to meet and respond to the total forecasted electricity consumption including loss in 2026, and appropriate support is required.

5. Sensitivity analysis

To address the quantity of electricity capacity at BEP level for each of the seven electricity user sectors in 2021, a suitable support point is required over the five-year period to effectively meet and support an increase in future total electricity consumption in 2026.

In other words, the total electricity consumption at BEP level in Table 8 is used to identify the new electricity capacity at BEP level for the seven electricity user sectors in 2026. Since each of the factors, namely $AVTFC_i$, AVC_i and P_i can affect the electricity capacity at BEP level, a suitable rate of change must be found to increase it in order to appropriately and effectively support the total forecasted electricity consumption, including loss for each of the seven electricity user sectors in 2026. Such change should include the creation of guidelines for administration planning of the electricity capacity. The changing factors used to calculate the new electricity capacity at BEP level by 2026 are considered for each of the seven electricity user sectors. The results of the three-way sensitivity analysis are illustrated in Table 9.

Table 9. The results of three-way sensitivity analysis on the BEP analysis equation

Sectors	Suitable rate change for three factors on the BEP analysis equation						New electricity capacity at BEP level in 2026 (1)	Target to support in 2026 (2)	Electricity capacity surplus in 2026 (1) > (2)
	Allocation value of the total fixed costs		Average electricity sales price per kWh		Average variable costs				
	Increase (%)	Baht/kWh	Decrease (%)	Baht/kWh	Increase (%)	Million Baht			
1. Residential	0.44	35.7556	0.05	3.5496	0.24	3.3960	232.7962	232.0125	0.7837
2. Small size business	0.68	16.3321	0.50	1.9751	0.67	1.7907	88.6127	88.3219	0.2908
3. Medium size business	0.27	12.5566	0.55	1.4246	0.20	1.3086	106.5836	106.2650	0.3186
4. Industrial	0.88	11.6547	0.60	1.2679	0.49	1.0189	46.7951	46.5963	0.1988
5. Specific business	0.74	1.0329	0.86	0.4806	0.74	0.1140	2.8174	2.8137	0.0037
6. Agricultural	0.80	0.2837	0.98	0.0533	0.79	0.0311	12.8084	12.7905	0.0179
7. Other	0.77	0.7140	0.89	0.4537	0.85	0.0823	1.9224	1.9211	0.0013

Note: Author’s calculation

Conclusion

Table 12 shows the effect of changing factors on the BEP analysis equation to establish which of these will affect the electricity capacity at BEP level of the seven electricity user sectors in five districts under the control of the PEA Surin Province to provide sufficient electricity capacity to catch up and support the total forecasted electricity consumption, including loss in 2026. Three-way sensitivity analysis is applied to study the effect on the BEP analysis equation and formulate three appropriate guidelines for the administration planning of electricity capacity, namely: the three guidelines for electricity $AVTFC_i$, AVC_i and P_i . Accordingly, all three appropriate guidelines for the administration planning of electricity capacity can be formulated as follows:

For the residential, small size businesses, medium size businesses, industrial, specific businesses, agricultural, and other sectors, the PEA Surin Province should formulate both $AVTFC_i$ and AVC_i administration plans to ensure the electricity capacity increases by 2026. The $AVTFC_i$ should be set to increase at the rate of 0.44%, 0.68%, 0.27%, 0.88%, 0.74%, 0.80%, and 0.77%, respectively. The AVC_i should also be set to increase at the rate of 0.24%, 0.67%, 0.20%, 0.49%, 0.74%, 0.79%, and 0.85%, respectively. When considered on an annual basis, it can be observed that the increases in $AVTFC_i$ and AVC_i are at a reasonable rate. The P_i of all seven electricity user sectors should be formulated to decrease at the rate of 0.05%, 0.50%, 0.55%, 0.60%, 0.86%, 0.98%, and 0.89%, respectively, when considered on an annual basis. It can be observed that a decrease formulated at the rate of P_i is reasonable.

When calculating the new electricity capacity at BEP level in 2026, the residential, small size businesses, medium size businesses, industrial, specific businesses, agricultural, and other sectors equated to 232.7962, 88.6127, 106.5836, 46.7951, 2.8174, 12.8084, and 1.9224 million kWh, respectively. In comparison, the target for electricity capacity surplus in 2026 equates to 0.7837, 0.2908, 0.3186, 0.1988, 0.0037, 0.0179, and 0.0013 million kWh (or 783,700.00, 290,800.00, 318,600.00, 198,800.00, 3,700.00, 17,900.00, 1,300.00 kWh), respectively, for the seven sectors.

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Suggestions

In Thailand, it should be noted that the Energy Regulatory Commission is responsible for determining the average electricity sales price per kWh by the PEA across the country. The PEA Head Office and PEA Surin Province do not have the authority to determine the electricity sales price per kWh, reflecting the inefficiency of electricity management and administration. The appropriateness of electricity pricing should be set at a specific rate by the agency responsible in each area rather than by the central government. Most importantly, it must suitably reflect the electricity consumption demands of electricity users in each sector. It is recommended that the centralised pricing policy be discontinued and the price of energy itself be set at a more appropriate level by the responsible agency in each area.

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