



Energy Cost Monitoring (ECM)

Nomura Lab at Keio Economic Observatory (KEO), Keio University, Tokyo

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1 Recent Estimates

1.1 Growth Rates

	Quarter-over-quarter growth rate			Month-over-month growth rate		
	2024Q1	2024Q2	2024Q3	July, 2024	August, 2024	September, 2024
a. RUEC (Real Unit Energy Cost) ($=b-c=e-d$)	1.8%	1.4%	1.9%	1.1%	-0.5%	-2.3%
b. Real Energy Price ($=b1-b2$)	1.2%	2.0%	1.5%	0.8%	0.3%	-3.5%
b1. Energy Price	1.5%	3.1%	2.2%	1.2%	0.6%	-3.5%
b2. GDP Price	0.3%	1.0%	0.7%	0.4%	0.2%	0.0%
c. Energy Productivity ($=c1-c2$)	-0.6%	0.6%	-0.3%	-0.3%	0.9%	-1.2%
c1. Real GDP	-0.6%	0.7%	0.5%	2.1%	-1.4%	0.3%
c2. Energy Consumption	0.0%	0.1%	0.8%	2.4%	-2.3%	1.5%
d. Nominal GDP ($=b2+c1$)	-0.3%	1.8%	1.2%	2.5%	-1.2%	0.3%
e. Energy Cost ($=b1+c2$)	1.5%	3.1%	3.1%	3.6%	-1.7%	-2.0%

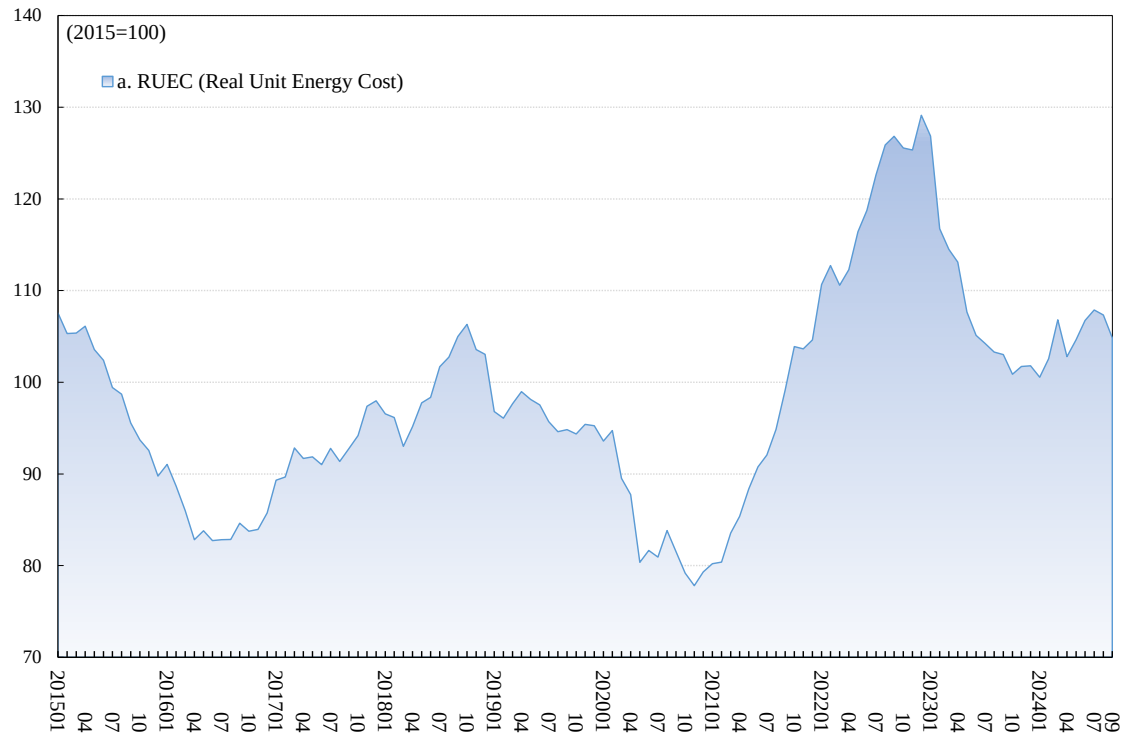
Unit: %. Notes: The most recent month is the forecasts, the previous month is the preliminary estimates, and the last two months or earlier are the final estimates. The aggregate volume indices of real GDP and energy consumption are measured using the translog index, based on the prices and volumes measured at 36 industries and 29 types of energy, respectively. The aggregate price indices of real GDP and energy consumption are defined implicitly.

1.2 Indices

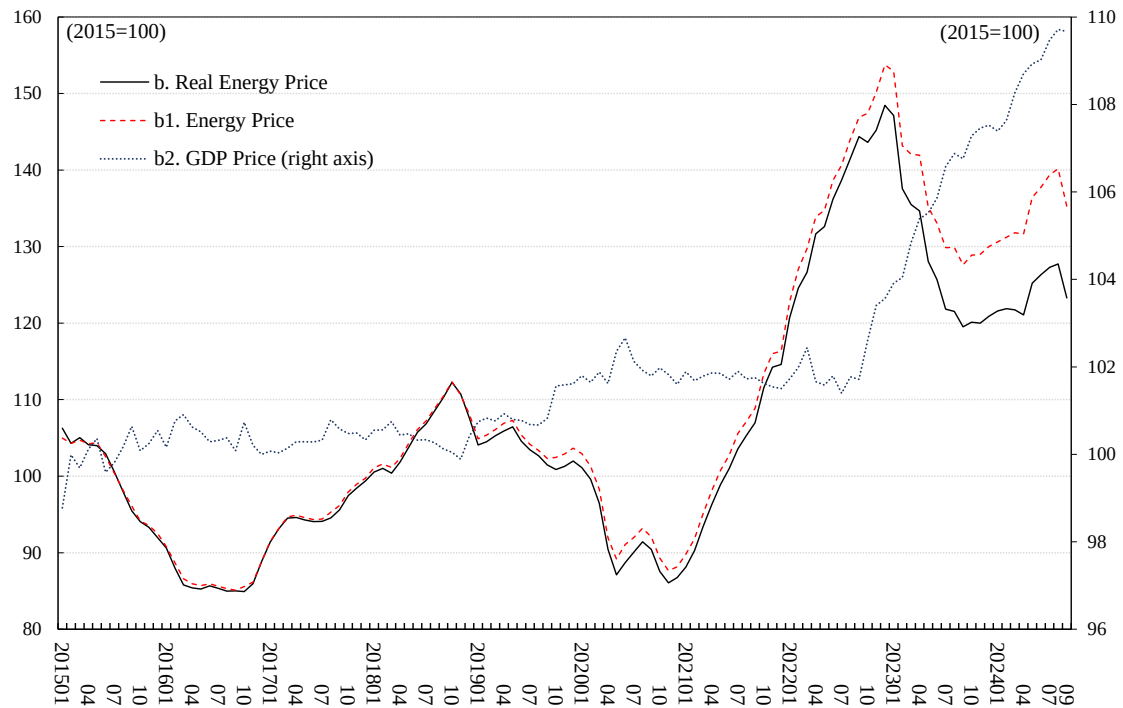
	Quarterly index			Monthly index		
	2024Q1	2024Q2	2024Q3	July, 2024	August, 2024	September, 2024
a. RUEC (Real Unit Energy Cost) ($=b/c=e/d$)	103.3	104.7	106.7	107.9	107.3	104.8
b. Real Energy Price ($=b1/b2$)	121.8	124.2	126.1	127.3	127.7	123.3
b1. Energy Price	131.2	135.2	138.3	139.4	140.2	135.2
b2. GDP Price	107.8	108.9	109.6	109.5	109.7	109.7
c. Energy Productivity ($=c1/c2$)	117.8	118.5	118.1	117.9	118.9	117.6
c1. Real GDP	103.0	103.7	104.2	105.1	103.6	104.0
c2. Energy Consumption	87.4	87.5	88.2	89.1	87.1	88.4
d. Nominal GDP ($=b2*c1$)	111.0	112.9	114.2	115.0	113.7	114.0
e. Energy Cost ($=b1*c2$)	114.7	118.3	121.9	124.1	122.0	119.6

Unit: 2015 average=100.

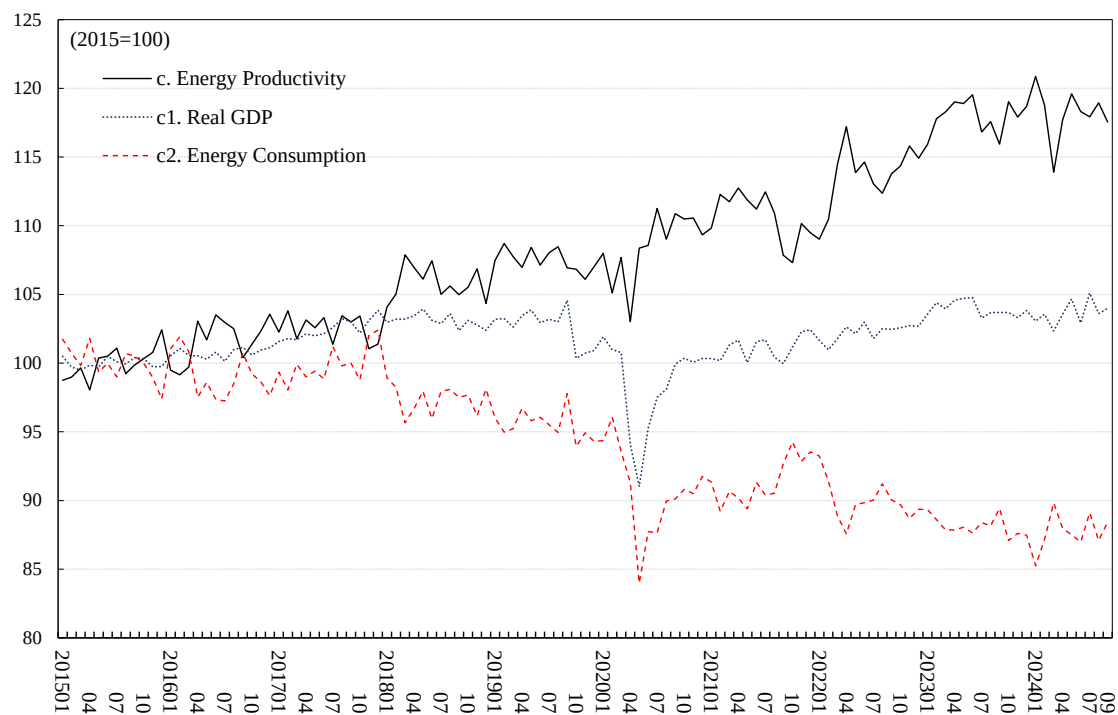
2 Monthly RUEC (Real Unit Energy Cost)



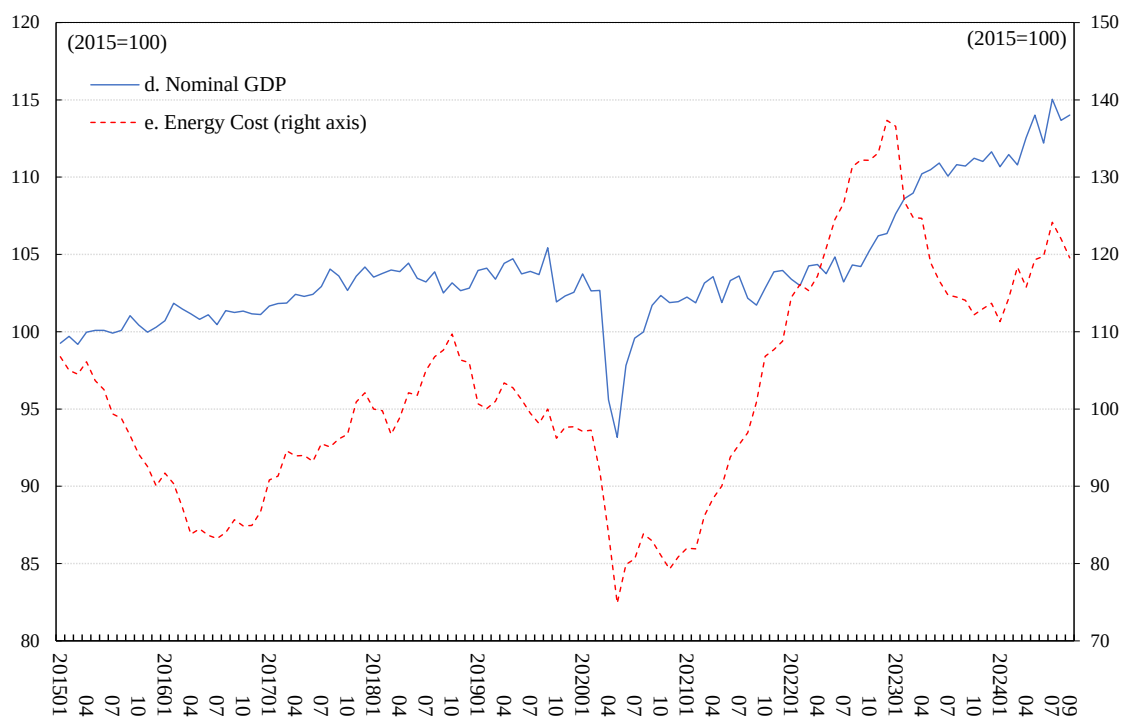
3 Monthly Real Energy Price



4 Monthly Real GDP and Energy Productivity



5 Monthly Nominal GDP and Energy Cost



6 Data Table

		a. RUEC (Real Unit Energy Cost)								d. Nominal GDP	e. Energy Cost
		b. Real Energy Price			c. Energy Productivity						
			b1. Energy Price	b2. GDP Price		c1. Real GDP	c2. Energy Consumption				
2015		100.0 (.072)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	
2016		84.9 (.061)	86.3	86.7	101.6	100.7	99.1	101.1	85.9	85.9	
2017		92.8 (.067)	95.1	95.5	100.3	102.5	102.4	102.8	95.4	95.4	
2018		99.9 (.072)	105.8	106.1	100.3	105.8	103.1	103.4	103.4	103.4	
2019		96.3 (.070)	103.5	104.5	101.0	107.5	102.7	103.7	99.8	99.8	
2020		84.2 (.061)	91.4	93.2	101.9	108.5	98.4	100.3	84.5	84.5	
2021		92.3 (.067)	102.1	103.9	101.7	110.6	101.1	102.8	94.9	94.9	
2022		119.8 (.087)	136.1	139.0	102.1	113.6	102.2	104.4	125.1	125.1	
2023		108.2 (.078)	127.6	135.3	106.0	118.0	104.0	110.2	119.2	119.2	
2020	Q1	92.6 (.067)	99.1	100.8	101.8	106.9	101.2	94.7	103.0	95.4	
	Q2	83.3 (.060)	88.8	90.8	102.2	106.6	93.4	87.6	95.5	79.5	
	Q3	82.1 (.059)	90.7	92.4	102.0	110.4	98.5	89.2	100.4	82.5	
	Q4	78.8 (.057)	86.8	88.4	101.8	110.1	100.3	91.0	102.1	80.4	
2021	Q1	81.4 (.059)	90.6	92.2	101.8	111.3	100.6	90.4	102.4	83.4	
	Q2	88.2 (.064)	98.7	100.5	101.8	111.9	101.1	90.3	102.9	90.8	
	Q3	95.3 (.069)	105.3	107.2	101.8	110.4	100.7	91.2	102.5	97.7	
	Q4	104.0 (.075)	113.4	115.2	101.6	109.0	102.0	93.5	103.6	107.8	
2022	Q1	111.3 (.080)	123.9	126.5	102.1	111.3	101.5	91.2	103.5	115.3	
	Q2	115.8 (.084)	133.5	135.8	101.7	115.2	102.6	89.0	104.3	120.8	
	Q3	125.1 (.090)	141.5	143.9	101.6	113.1	102.3	90.4	103.9	130.0	
	Q4	126.7 (.091)	145.8	150.4	103.2	115.0	102.7	89.2	105.9	134.2	
2023	Q1	119.3 (.086)	140.1	146.1	104.3	117.3	104.0	88.6	108.4	129.4	
	Q2	108.6 (.078)	129.5	136.7	105.6	119.1	104.7	87.9	110.5	120.1	
	Q3	103.5 (.075)	120.9	129.1	106.7	116.8	103.6	88.7	110.5	114.4	
	Q4	101.5 (.073)	120.3	129.3	107.4	118.5	103.6	87.4	111.3	112.9	
2024	Q1	103.3 (.075)	121.8	131.2	107.8	117.8	103.0	87.4	111.0	114.7	
	Q2	104.7 (.076)	124.2	135.2	108.9	118.5	103.7	87.5	112.9	118.3	
	Q3	106.7 (.077)	126.1	138.3	109.6	118.1	104.2	88.2	114.2	121.9	
2020	01	93.6 (.068)	101.1	102.9	101.8	108.0	101.9	94.4	103.7	97.1	
	02	94.7 (.068)	99.6	101.3	101.6	105.1	101.0	96.1	102.6	97.3	
	03	89.5 (.065)	96.5	98.3	101.9	107.7	100.8	93.6	102.7	91.9	
	04	87.7 (.063)	90.4	91.9	101.6	103.0	94.1	91.3	95.6	83.9	
	05	80.3 (.058)	87.1	89.2	102.4	108.4	91.0	84.0	93.2	74.9	
	06	81.7 (.059)	88.7	91.1	102.7	108.6	95.3	87.7	97.8	79.9	
	07	80.9 (.058)	90.1	92.0	102.1	111.3	97.5	87.6	99.6	80.6	
	08	83.8 (.061)	91.4	93.2	101.9	109.0	98.1	90.0	100.0	83.8	
	09	81.5 (.059)	90.4	92.1	101.8	110.9	99.9	90.1	101.7	82.9	
	10	79.2 (.057)	87.5	89.3	102.0	110.5	100.4	90.8	102.3	81.1	
	11	77.8 (.056)	86.1	87.7	101.8	110.6	100.1	90.5	101.9	79.3	
	12	79.3 (.057)	86.8	88.2	101.6	109.3	100.3	91.7	101.9	80.9	
2021	01	80.2 (.058)	88.1	89.8	101.9	109.8	100.3	91.4	102.2	82.0	
	02	80.4 (.058)	90.3	91.8	101.7	112.3	100.2	89.2	101.9	81.9	
	03	83.5 (.060)	93.4	95.1	101.8	111.7	101.3	90.7	103.1	86.2	
	04	85.4 (.062)	96.3	98.1	101.9	112.7	101.7	90.2	103.6	88.4	
	05	88.4 (.064)	98.9	100.8	101.9	111.9	100.0	89.4	101.9	90.0	
	06	90.8 (.066)	101.0	102.7	101.7	111.2	101.6	91.3	103.3	93.8	
	07	92.1 (.066)	103.6	105.6	101.9	112.5	101.7	90.4	103.6	95.4	
	08	94.9 (.069)	105.3	107.1	101.7	110.9	100.4	90.5	102.2	96.9	
	09	99.1 (.072)	107.0	108.9	101.8	107.9	100.0	92.7	101.7	100.9	
	10	103.9 (.075)	111.5	113.4	101.6	107.3	101.2	94.3	102.8	106.8	
	11	103.6 (.075)	114.2	116.0	101.5	110.2	102.3	92.8	103.9	107.7	
	12	104.6 (.076)	114.6	116.3	101.5	109.5	102.4	93.5	104.0	108.8	
2022	01	110.7 (.080)	120.7	122.8	101.7	109.0	101.6	93.2	103.4	114.4	
	02	112.7 (.081)	124.6	127.1	102.0	110.5	101.0	91.4	103.0	116.1	
	03	110.6 (.080)	126.6	129.7	102.4	114.5	101.8	88.9	104.3	115.3	
	04	112.3 (.081)	131.7	133.9	101.7	117.2	102.6	87.6	104.3	117.2	
	05	116.4 (.084)	132.6	134.7	101.6	113.9	102.1	89.7	103.8	120.8	
	06	118.7 (.086)	136.2	138.7	101.8	114.6	103.0	89.8	104.8	124.5	
	07	122.6 (.089)	138.7	140.7	101.4	113.1	101.8	90.0	103.2	126.6	
	08	125.9 (.091)	141.5	144.0	101.8	112.4	102.5	91.2	104.3	131.3	
	09	126.8 (.092)	144.4	146.9	101.7	113.8	102.5	90.0	104.2	132.2	
	10	125.6 (.091)	143.6	147.4	102.6	114.4	102.6	89.7	105.3	132.2	
	11	125.3 (.091)	145.2	150.2	103.4	115.8	102.7	88.7	106.2	133.1	
	12	129.1 (.093)	148.4	153.8	103.6	114.9	102.7	89.4	106.4	137.3	
2023	01	126.9 (.092)	147.1	152.9	103.9	115.9	103.6	89.3	107.6	136.6	
	02	116.7 (.084)	137.6	143.2	104.0	117.8	104.4	88.6	108.6	126.8	
	03	114.5 (.083)	135.5	142.1	104.8	118.3	103.9	87.9	109.0	124.8	
	04	113.1 (.082)	134.7	141.9	105.4	119.0	104.6	87.9	110.2	124.7	
	05	107.7 (.078)	128.1	135.1	105.5	118.9	104.7	88.1	110.5	119.0	
	06	105.1 (.076)	125.7	133.1	105.9	119.5	104.8	87.6	110.9	116.6	
	07	104.2 (.075)	121.8	129.9	106.6	116.8	103.3	88.4	110.1	114.7	
	08	103.3 (.075)	121.5	129.9	106.9	117.6	103.7	88.2	110.8	114.5	
	09	103.0 (.074)	119.5	127.6	106.8	115.9	103.7	89.4	110.7	114.1	
	10	100.9 (.073)	120.1	128.9	107.3	119.0	103.7	87.1	111.2	112.2	
	11	101.7 (.073)	120.0	129.0	107.5	117.9	103.3	87.6	111.0	113.0	
	12	101.8 (.074)	120.9	130.0	107.5	118.7	103.8	87.5	111.6	113.7	
2024	01	100.6 (.073)	121.6	130.6	107.4	120.9	103.1	85.2	110.7	111.3	
	02	102.6 (.074)	121.9	131.2	107.6	118.8	103.6	87.2	111.5	114.3	
	03	106.8 (.077)	121.7	131.8	108.3	113.9	102.3	89.8	110.8	118.4	
	04	102.8 (.074)	121.1	131.6	108.7	117.7	103.6	88.0	112.6	115.7	
	05	104.6 (.076)	125.2	136.4	108.9	119.6	104.7	87.5	114.0	119.3	
	06	106.7 (.077)	126.3	137.8	109.0	118.3	102.9	87.0	112.2	119.8	
	07	107.9 (.078)	127.3	139.4	109.5	117.9	105.1	89.1	115.0	124.1	
	08	107.3 (.078)	127.7	140.2	109.7	118.9	103.6	87.1	113.7	122.0	
	09	104.8 (.076)	123.3	135.2	109.7	117.6	104.0	88.4	114.0	119.6	

Unit: 2015 average=100. Note: The numbers in parentheses are the ratio of final energy consumption cost to GDP at current prices.