



Energy Cost Monitoring (ECM)

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

ECM_JPN_202503

April 7, 2025

Koji Nomura, Sho Inaba, and Mansaku Yoshida

1 Recent Estimates

1.1 Growth Rates

	Quarter-over-quarter growth rate			Month-over-month growth rate		
	2024Q2	2024Q3	2024Q4	December, 2024	January, 2025	February, 2025
a. RUEC (Real Unit Energy Cost) ($=b-c=e-d$)	1.0%	3.0%	-4.0%	2.9%	-1.0%	-0.9%
b. Real Energy Price ($=b1-b2$)	1.8%	1.9%	-2.3%	1.0%	0.6%	-1.3%
b1. Energy Price	3.2%	2.3%	-1.9%	1.3%	0.4%	-1.2%
b2. GDP Price	1.3%	0.3%	0.4%	0.3%	-0.2%	0.1%
c. Energy Productivity ($=c1-c2$)	0.8%	-1.0%	1.7%	-1.8%	1.6%	-0.4%
c1. Real GDP	0.8%	0.4%	0.6%	0.3%	0.6%	0.0%
c2. Energy Consumption	0.0%	1.4%	-1.2%	2.1%	-1.1%	0.4%
d. Nominal GDP ($=b2+c1$)	2.2%	0.7%	0.9%	0.6%	0.4%	0.0%
e. Energy Cost ($=b1+c2$)	3.2%	3.7%	-3.1%	3.5%	-0.6%	-0.8%

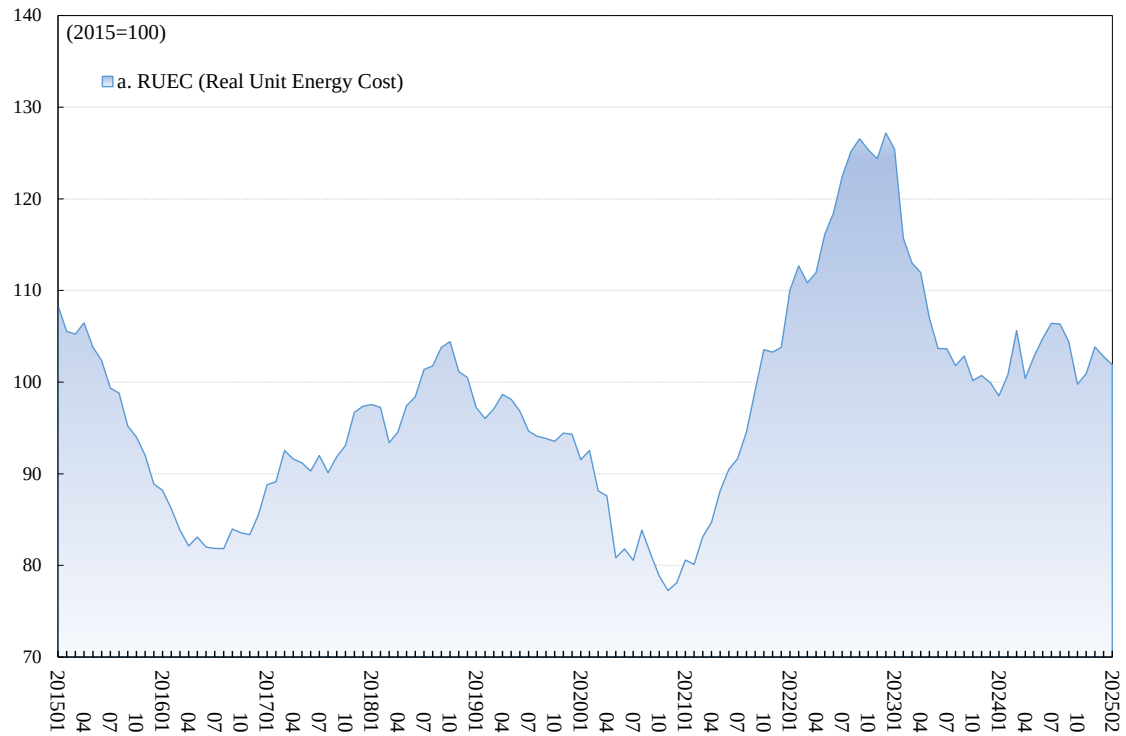
Unit: %. Notes: The most recent month is the forecasts, the previous month is the preliminary estimates, and the last two months or earlier are the final estimates. The aggregate volume indices of real GDP and energy consumption are measured using the translog index, based on the prices and volumes measured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

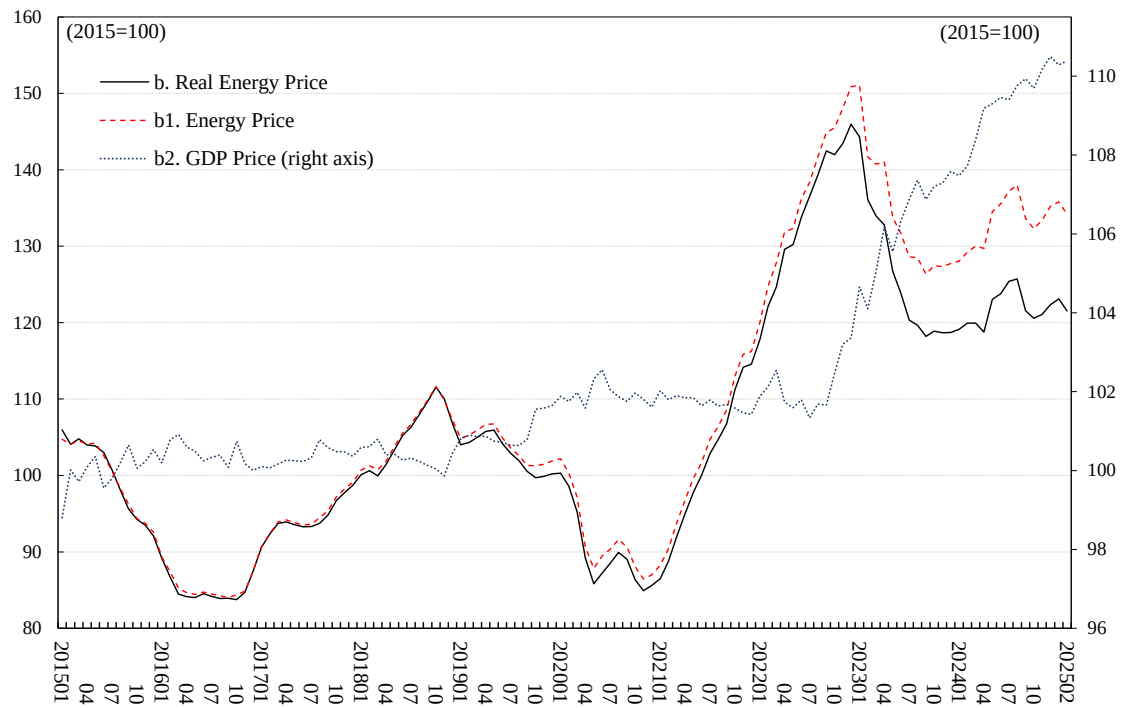
	Quarterly index			Monthly index		
	2024Q2	2024Q3	2024Q4	December, 2024	January, 2025	February, 2025
a. RUEC (Real Unit Energy Cost) ($=b/c=e/d$)	102.6	105.7	101.5	103.8	102.8	101.9
b. Real Energy Price ($=b1/b2$)	121.9	124.2	121.3	122.3	123.1	121.5
b1. Energy Price	133.2	136.3	133.6	135.2	135.8	134.2
b2. GDP Price	109.3	109.7	110.1	110.5	110.3	110.4
c. Energy Productivity ($=c1/c2$)	118.6	117.4	119.4	117.7	119.6	119.2
c1. Real GDP	103.5	103.9	104.4	104.4	105.0	104.9
c2. Energy Consumption	87.2	88.5	87.4	88.7	87.7	88.0
d. Nominal GDP ($=b2*c1$)	113.1	113.9	115.0	115.3	115.8	115.8
e. Energy Cost ($=b1*c2$)	116.2	120.5	116.8	119.8	119.0	118.1

Unit: 2015 average=100.

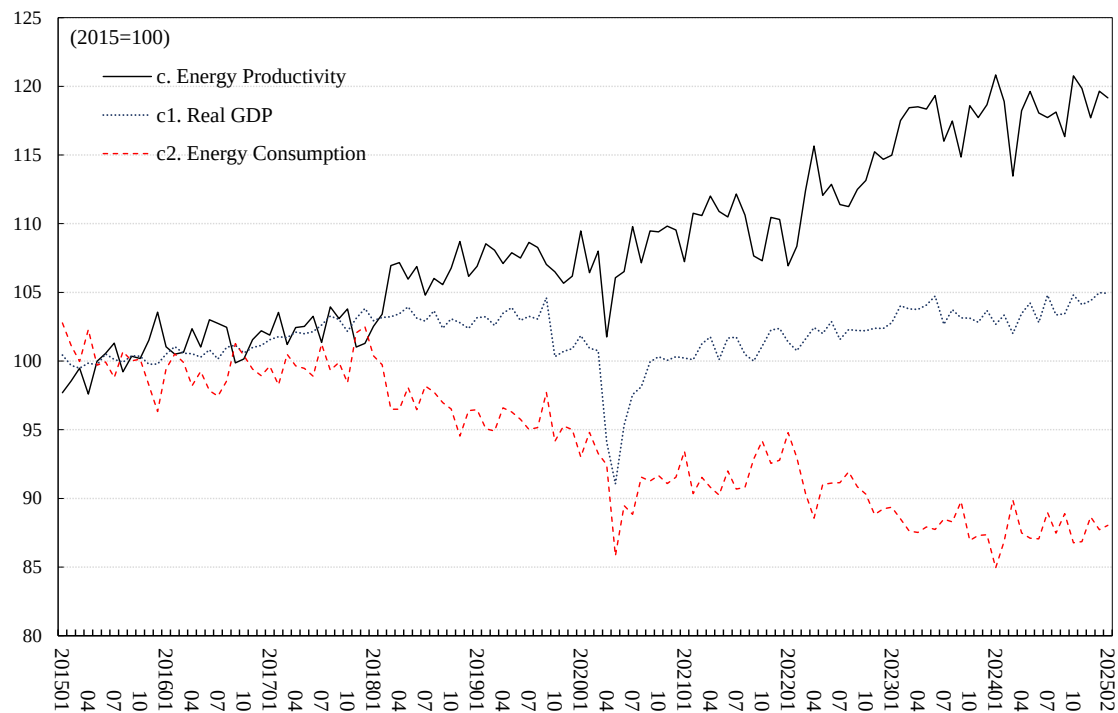
2 Monthly RUEC (Real Unit Energy Cost)



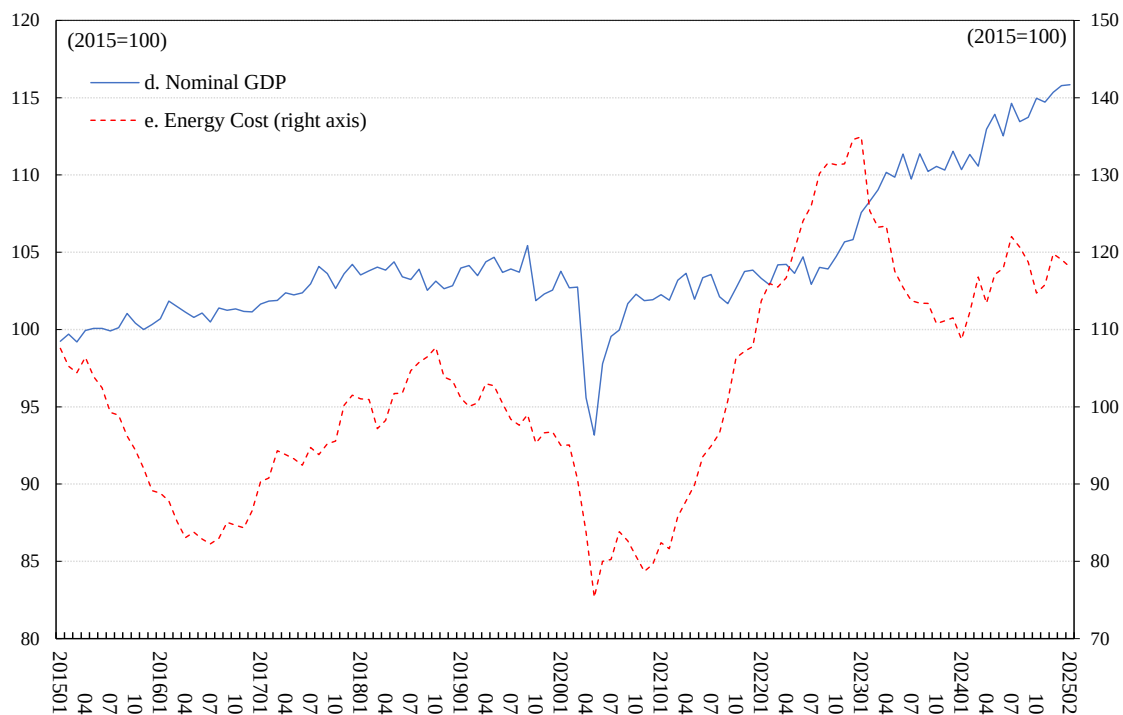
3 Monthly Real Energy Price



4 Monthly Real GDP and Energy Productivity



5 Monthly Nominal GDP and Energy Cost



6 Data Table

	a. RUEC (Real Unit Energy Cost)					c. Energy Productivity					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 (.071)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0		
2016	83.8 (.060)	85.0	85.4	100.4	101.5	100.7	99.3	101.1	84.8	84.8		
2017	92.1 (.066)	94.4	94.7	100.3	102.5	102.4	100.0	102.8	94.7	94.7		
2018	99.3 (.071)	105.2	105.5	100.3	105.9	103.1	97.3	103.4	102.7	102.7		
2019	95.8 (.068)	102.8	103.8	101.0	107.4	102.7	95.6	103.7	99.3	99.3		
2020	83.6 (.060)	90.1	91.8	101.9	107.8	98.4	91.2	100.3	83.8	83.8		
2021	92.0 (.066)	101.2	102.9	101.7	110.0	101.1	91.9	102.8	94.6	94.6		
2022	119.3 (.085)	133.9	136.7	102.1	112.2	102.0	90.9	104.2	124.3	124.3		
2023	107.1 (.076)	125.9	133.8	106.3	117.5	103.5	88.1	110.0	117.8	117.8		
2024	102.9 (.073)	121.7	133.0	109.3	118.3	103.6	87.6	113.2	116.5	116.5		
2020 Q1	90.7 (.065)	98.0	99.9	101.9	108.0	101.2	93.7	103.1	93.5	93.5		
Q2	83.4 (.059)	87.5	89.4	102.2	104.8	93.5	89.2	95.5	79.5	79.5		
Q3	81.9 (.058)	89.2	90.9	101.9	108.8	98.5	90.5	100.4	82.2	82.2		
Q4	78.1 (.056)	85.6	87.2	101.8	109.6	100.2	91.4	102.0	79.7	79.7		
2021 Q1	81.3 (.058)	89.1	90.8	101.9	109.5	100.5	91.8	102.4	83.3	83.3		
Q2	87.8 (.063)	97.6	99.4	101.8	111.1	101.2	91.0	103.0	90.4	90.4		
Q3	95.1 (.068)	104.8	106.6	101.7	110.1	100.7	91.5	102.5	97.4	97.4		
Q4	103.5 (.074)	113.3	115.0	101.5	109.4	101.9	93.2	103.4	107.1	107.1		
2022 Q1	111.2 (.079)	121.5	124.2	102.2	109.2	101.2	92.7	103.5	115.1	115.1		
Q2	115.5 (.082)	131.2	133.5	101.7	113.5	102.4	90.2	104.2	120.4	120.4		
Q3	124.7 (.089)	139.4	141.6	101.6	111.7	102.0	91.3	103.6	129.3	129.3		
Q4	125.6 (.090)	143.8	148.1	103.0	114.4	102.3	89.5	105.4	132.5	132.5		
2023 Q1	118.0 (.084)	138.1	144.5	104.6	117.0	103.5	88.5	108.3	127.8	127.8		
Q2	107.5 (.077)	127.8	135.5	106.0	118.7	104.2	87.7	110.5	118.8	118.8		
Q3	102.8 (.073)	119.4	127.5	107.0	116.1	103.2	88.9	110.4	113.5	113.5		
Q4	100.3 (.072)	118.7	127.5	107.4	118.3	103.2	87.2	110.8	111.1	111.1		
2024 Q1	101.6 (.072)	119.7	129.1	107.9	117.7	102.7	87.2	110.7	112.6	112.6		
Q2	102.6 (.073)	121.9	133.2	109.3	118.6	103.5	87.2	113.1	116.2	116.2		
Q3	105.7 (.075)	124.2	136.3	109.7	117.4	103.9	88.5	113.9	120.5	120.5		
Q4	101.5 (.072)	121.3	133.6	110.1	119.4	104.4	87.4	115.0	116.8	116.8		
2020 01	91.5 (.065)	100.3	102.2	101.9	109.5	101.9	93.0	103.8	95.0	95.0		
02	92.5 (.066)	98.6	100.3	101.7	106.4	100.9	94.8	102.7	95.1	95.1		
03	88.1 (.063)	95.3	97.2	102.0	108.0	100.8	93.3	102.8	90.6	90.6		
04	87.6 (.062)	89.2	90.6	101.6	101.8	94.1	92.5	95.6	83.8	83.8		
05	80.8 (.058)	85.8	87.8	102.3	106.1	91.1	85.8	93.2	75.3	75.3		
06	81.8 (.058)	87.2	89.4	102.6	106.5	95.3	89.5	97.8	80.0	80.0		
07	80.6 (.057)	88.5	90.3	102.0	109.8	97.6	88.8	99.6	80.2	80.2		
08	83.8 (.060)	89.9	91.6	101.9	107.2	98.1	91.5	100.0	83.8	83.8		
09	81.3 (.058)	89.0	90.6	101.8	109.5	99.9	91.3	101.7	82.6	82.6		
10	78.8 (.056)	86.3	88.0	102.0	109.4	100.3	91.7	102.3	80.7	80.7		
11	77.3 (.055)	84.9	86.5	101.8	109.8	100.1	91.1	101.9	78.7	78.7		
12	78.1 (.056)	85.6	87.0	101.6	109.5	100.3	91.6	101.9	79.6	79.6		
2021 01	80.6 (.057)	86.5	88.2	102.0	107.2	100.2	93.4	102.3	82.4	82.4		
02	80.1 (.057)	88.8	90.4	101.8	110.8	100.1	90.3	101.9	81.6	81.6		
03	83.1 (.059)	92.0	93.8	101.9	110.6	101.3	91.5	103.2	85.8	85.8		
04	84.7 (.060)	95.0	96.7	101.8	112.0	101.8	90.8	103.6	87.8	87.8		
05	88.1 (.063)	97.8	99.6	101.8	110.9	100.1	90.3	102.0	89.9	89.9		
06	90.5 (.065)	100.1	101.7	101.6	110.5	101.7	92.0	103.3	93.5	93.5		
07	91.6 (.065)	102.9	104.7	101.8	112.2	101.7	90.7	103.6	94.9	94.9		
08	94.6 (.067)	104.7	106.4	101.6	110.6	100.5	90.8	102.1	96.6	96.6		
09	99.1 (.071)	106.8	108.6	101.7	107.7	100.0	92.9	101.7	100.8	100.8		
10	103.5 (.074)	111.2	113.0	101.6	107.3	101.1	94.2	102.7	106.3	106.3		
11	103.3 (.074)	114.2	115.9	101.5	110.5	102.3	92.5	103.7	107.2	107.2		
12	103.8 (.074)	114.6	116.2	101.4	110.3	102.4	92.8	103.8	107.8	107.8		
2022 01	110.1 (.078)	117.8	120.0	101.9	106.9	101.4	94.8	103.3	113.7	113.7		
02	112.7 (.080)	122.2	124.8	102.1	108.3	100.8	93.0	102.9	116.0	116.0		
03	110.8 (.079)	124.7	127.9	102.5	112.4	101.6	90.4	104.2	115.5	115.5		
04	112.0 (.080)	129.6	131.9	101.7	115.7	102.4	88.6	104.2	116.7	116.7		
05	116.1 (.083)	130.2	132.3	101.6	112.1	102.0	91.0	103.6	120.4	120.4		
06	118.4 (.084)	133.8	136.2	101.8	112.9	102.9	91.1	104.7	124.0	124.0		
07	122.4 (.087)	136.5	138.3	101.3	111.4	101.6	91.2	102.9	126.0	126.0		
08	125.1 (.089)	139.3	141.7	101.7	111.2	102.3	91.9	104.0	130.0	130.0		
09	126.6 (.090)	142.5	144.9	101.7	112.5	102.2	90.9	103.9	131.5	131.5		
10	125.4 (.089)	142.0	145.5	102.5	113.1	102.2	90.3	104.7	131.3	131.3		
11	124.4 (.089)	143.4	148.1	103.2	115.2	102.4	88.8	105.7	131.4	131.4		
12	127.2 (.091)	146.0	150.9	103.4	114.7	102.4	89.2	105.8	134.6	134.6		
2023 01	125.4 (.089)	144.3	151.1	104.7	115.0	102.8	89.4	107.6	134.9	134.9		
02	115.7 (.083)	136.1	141.7	104.1	117.5	104.0	88.5	108.3	125.4	125.4		
03	113.0 (.081)	134.0	140.7	105.0	118.4	103.8	87.6	109.0	123.2	123.2		
04	112.0 (.080)	132.8	141.0	106.2	118.5	103.8	87.5	110.2	123.4	123.4		
05	107.0 (.076)	126.7	133.8	105.6	118.4	104.1	87.9	109.9	117.5	117.5		
06	103.7 (.074)	123.8	131.7	106.3	119.3	104.7	87.7	111.4	115.5	115.5		
07	103.6 (.074)	120.3	128.6	106.9	116.0	102.7	88.5	109.7	113.8	113.8		
08	101.8 (.073)	119.7	128.5	107.4	117.5	103.7	88.3	111.4	113.4	113.4		
09	102.8 (.073)	118.2	126.4	106.9	114.9	103.1	89.8	110.2	113.4	113.4		
10	100.2 (.071)	118.9	127.5	107.2	118.6	103.1	86.9	110.6	110.8	110.8		
11	100.7 (.072)	118.7	127.4	107.3	117.7	102.8	87.3	110.3	111.1	111.1		
12	100.0 (.071)	118.7	127.7	107.6	118.7	103.7	87.3	111.5	111.5	111.5		
2024 01	98.5 (.070)	119.1	128.1	107.5	120.8	102.7	84.9	110.3	108.7	108.7		
02	100.8 (.072)	119.9	129.2	107.7	118.9	103.3	86.9	111.3	112.2	112.2		
03	105.6 (.075)	119.9	130.0	108.4	113.5	102.0	89.9	110.6	116.0	116.0		
04	100.4 (.072)	118.8	129.7	109.2	118.2	103.5	87.5	113.0	113.4	113.4		
05	102.8 (.073)	123.1	134.5	109.3	119.6	104.2	87.1	113.9	117.1	117.1		
06	104.8 (.075)	123.8	135.5	109.5	118.1	102.8	87.0	112.5	117.9	117.9		
07	106.4 (.076)	125.4	137.2	109.4	117.7	104.8	89.0	114.6	122.0	122.0		
08	106.3 (.076)	125.7	138.0	109.8	118.1	103.4	87.5	113.4	120.7	120.7		
09	104.4 (.074)	121.5	133.6	109.9	116.3	103.5	88.9	113.7	118.7	118.7		
10	99.8 (.071)	120.6	132.3	109.7	120.8	104.8	86.8	115.0	114.7	114.7		
11	100.9 (.072)	121.1	133.4	110.2	119.9	104.1	86.8	114.7	115.8	115.8		
12	103.8 (.074)	122.3	135.2	110.5	117.7	104.4	88.7	115.3	119.8	119.8		
2025 01	102.8 (.073)	123.1	135.8	110.3	119.6	105.0	87.7	115.8	119.0	119.0		
02	101.9 (.073)	121.5	134.2	110.4	119.2	104.9	88.0	115.8	118.8	118.8		

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