



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		
	2023Q3	2023Q4	2024Q1	February, 2024	March, 2024	April, 2024
a. RUEC (Real Unit Energy Cost) ($=b-c=e-d$)	-5.2%	-2.3%	1.4%	1.3%	4.6%	-1.6%
b. Real Energy Price ($=b1-b2$)	-5.9%	-1.2%	1.4%	0.2%	-0.3%	0.1%
b1. Energy Price	-5.2%	-0.8%	1.7%	0.4%	0.2%	0.2%
b2. GDP Price	0.8%	0.4%	0.2%	0.3%	0.5%	0.2%
c. Energy Productivity ($=c1-c2$)	-0.8%	1.2%	0.0%	-1.1%	-4.7%	1.7%
c1. Real GDP	-0.8%	0.1%	-0.9%	0.6%	-1.0%	-0.1%
c2. Energy Consumption	-0.1%	-1.1%	-0.9%	1.7%	3.9%	-1.8%
d. Nominal GDP ($=b2+c1$)	0.0%	0.5%	-0.6%	0.9%	-0.5%	0.0%
e. Energy Cost ($=b1+c2$)	-5.3%	-1.8%	0.8%	2.1%	4.1%	-1.6%

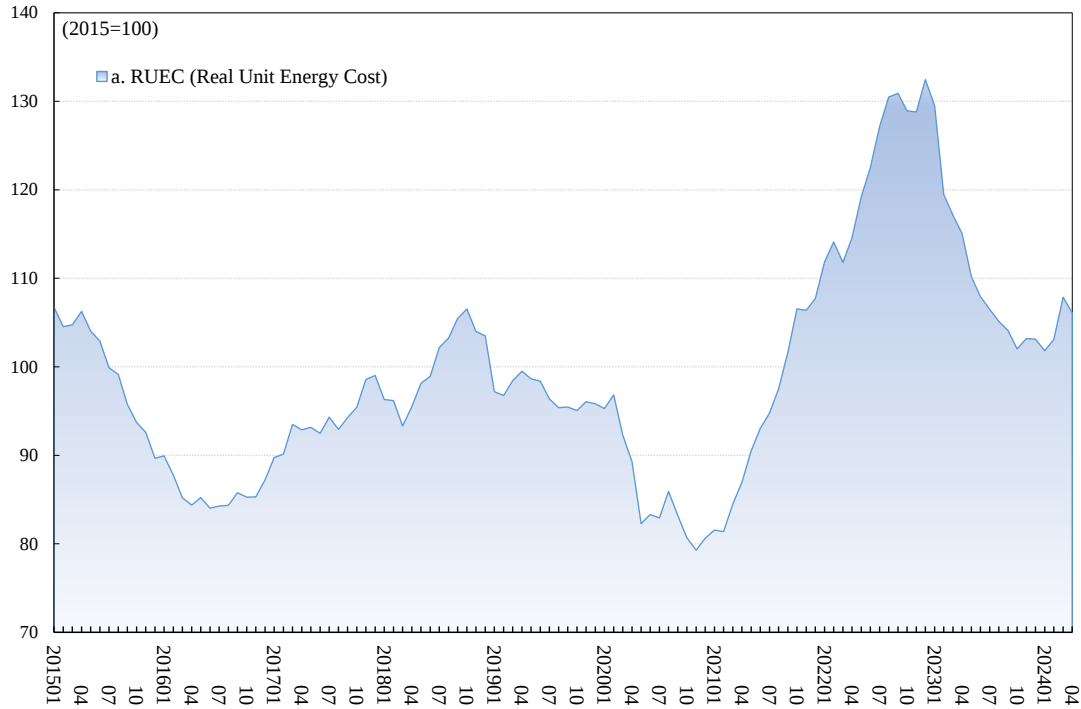
Unit: %. Notes: The most recent month is the forecasts, the previous month is the preliminary estimates, and the last two months or earlier are the final estimates. The aggregate volume indices of real GDP and energy consumption are measured using the translog index, based on the prices and volumes measured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

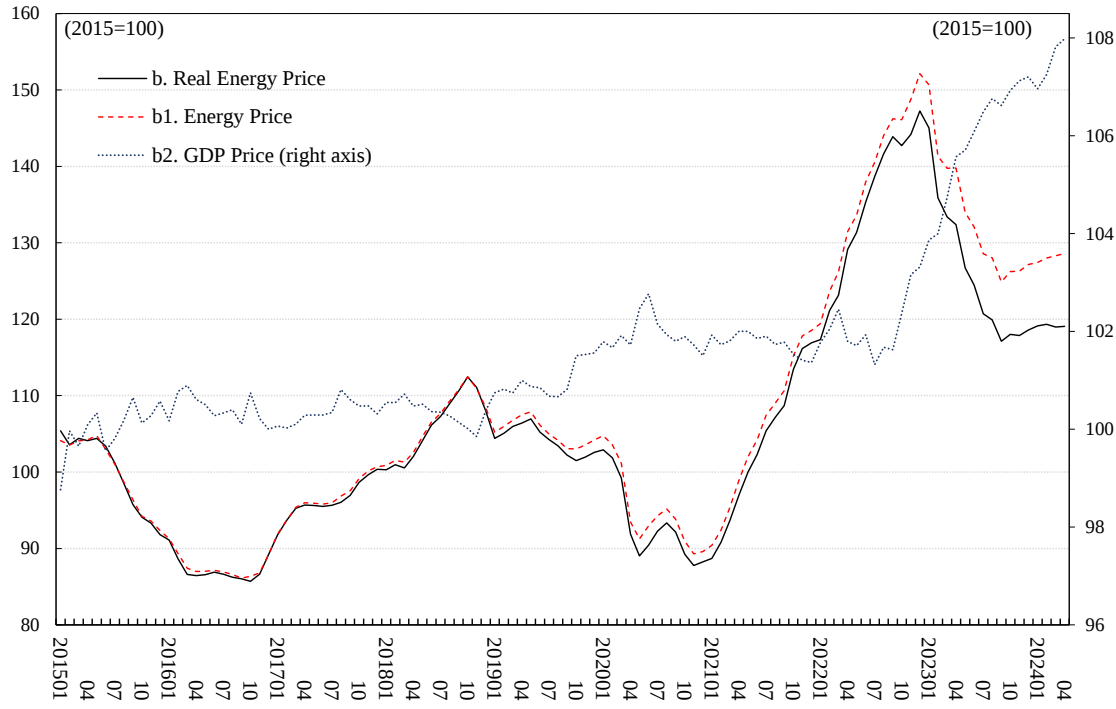
	Quarterly index			Monthly index		
	2023Q3	2023Q4	2024Q1	February, 2024	March, 2024	April, 2024
a. RUEC (Real Unit Energy Cost) ($=b/c=e/d$)	105.2	102.8	104.3	103.1	107.9	106.1
b. Real Energy Price ($=b1/b2$)	122.9	121.5	123.2	119.3	119.0	119.1
b1. Energy Price	131.1	130.1	132.3	128.0	128.3	128.6
b2. GDP Price	106.6	107.1	107.3	107.3	107.8	108.0
c. Energy Productivity ($=c1/c2$)	116.8	118.1	118.1	115.7	110.3	112.2
c1. Real GDP	103.7	103.8	102.9	103.4	102.4	102.3
c2. Energy Consumption	88.8	87.9	87.1	89.4	92.9	91.2
d. Nominal GDP ($=b2*c1$)	110.6	111.2	110.4	110.9	110.4	110.5
e. Energy Cost ($=b1*c2$)	116.4	114.3	115.2	114.4	119.1	117.2

Unit: 2015 average=100.

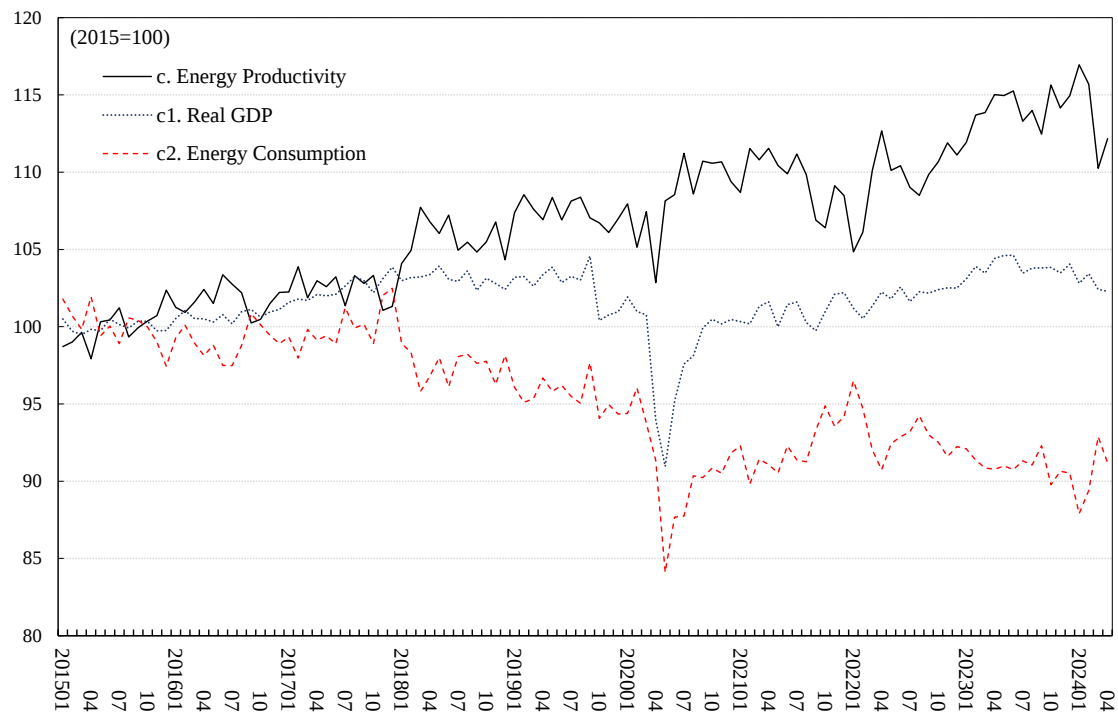
2 Monthly RUEC (Real Unit Energy Cost)



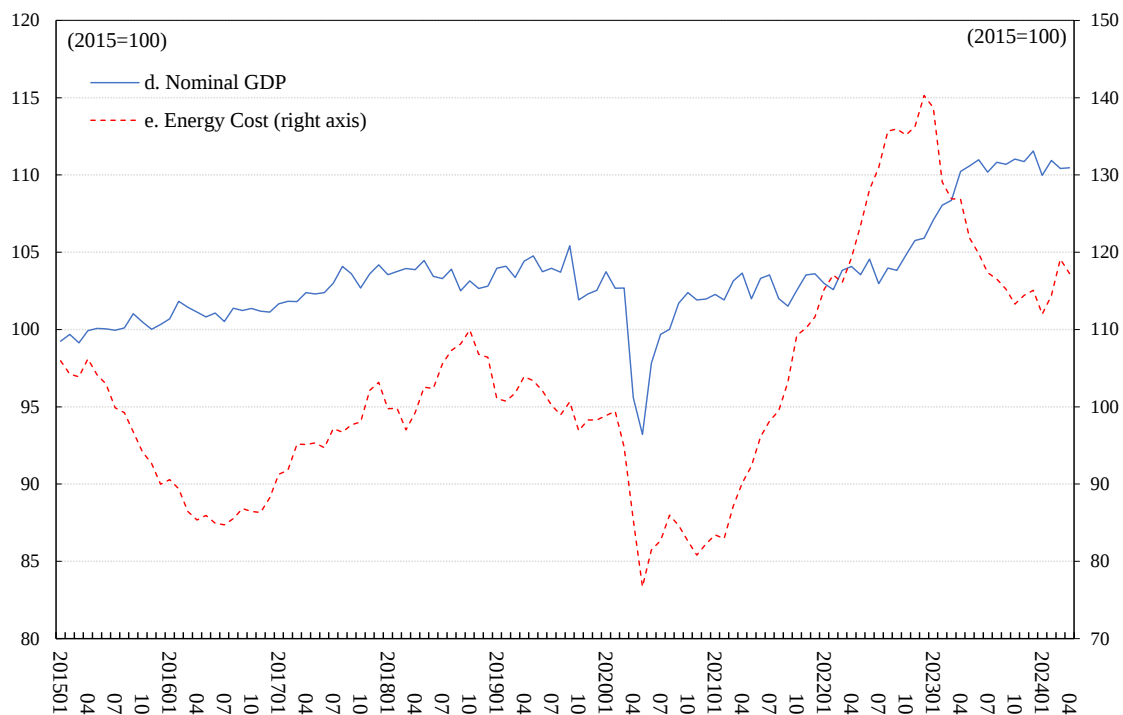
3 Monthly Real Energy Price



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 (.073)	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2016		85.7 (.063)	87.5	87.9	100.4	102.1	100.7	98.7	86.7
2017		93.9 (.069)	96.5	96.8	100.3	102.8	102.4	99.7	96.5
2018		100.3 (.073)	106.2	106.6	100.3	105.9	103.1	97.3	103.4
2019		96.9 (.071)	104.4	105.5	101.0	107.7	102.7	95.3	103.7
2020		86.1 (.063)	94.9	96.8	101.9	110.3	98.4	89.2	100.3
2021		94.4 (.069)	104.8	106.7	101.8	111.0	101.0	90.9	102.8
2022		122.8 (.090)	137.8	140.7	102.1	112.3	101.9	90.8	104.1
2023		110.2 (.081)	129.0	136.6	105.9	117.0	103.9	88.8	110.0
2020	Q1	94.8 (.069)	101.9	103.7	101.8	107.4	101.2	94.2	103.0
	Q2	85.0 (.062)	92.6	94.8	102.3	109.0	93.4	85.7	95.5
	Q3	84.0 (.061)	95.1	97.0	102.0	113.2	98.5	87.0	100.5
	Q4	80.2 (.059)	89.8	91.3	101.7	111.9	100.4	89.7	102.1
2021	Q1	82.5 (.060)	92.6	94.3	101.8	112.2	100.6	89.7	102.4
	Q2	90.2 (.066)	101.0	102.9	102.0	111.9	101.0	90.2	103.0
	Q3	98.0 (.072)	108.2	110.1	101.8	110.4	100.5	91.1	102.4
	Q4	106.9 (.078)	117.3	119.0	101.4	109.7	101.8	92.8	103.2
2022	Q1	112.6 (.082)	123.5	126.1	102.1	109.6	101.0	92.1	103.1
	Q2	118.8 (.087)	134.9	137.4	101.8	113.6	102.2	90.0	104.1
	Q3	129.5 (.095)	145.1	147.4	101.5	112.0	102.0	91.1	103.6
	Q4	130.1 (.095)	148.1	152.5	102.9	113.9	102.5	90.0	105.5
2023	Q1	122.0 (.089)	141.0	147.0	104.2	115.6	103.5	89.6	107.8
	Q2	111.0 (.081)	130.7	138.3	105.8	117.6	104.5	88.9	110.6
	Q3	105.2 (.077)	122.9	131.1	106.6	116.8	103.7	88.8	110.6
	Q4	102.8 (.075)	121.5	130.1	107.1	118.1	103.8	87.9	111.2
2024	Q1	104.3 (.076)	123.2	132.3	107.3	118.1	102.9	87.1	110.4
2020	01	95.3 (.070)	102.9	104.8	101.8	107.9	101.9	94.4	103.7
	02	96.8 (.071)	101.9	103.6	101.7	105.1	101.0	96.0	102.7
	03	92.3 (.067)	99.2	101.1	101.9	107.5	100.8	93.8	102.7
	04	89.3 (.065)	91.9	93.5	101.7	102.9	94.0	91.3	95.6
	05	82.3 (.060)	89.0	91.2	102.5	108.1	91.0	84.1	93.2
	06	83.3 (.061)	90.4	93.0	102.8	108.5	95.2	87.7	97.8
	07	82.9 (.061)	92.3	94.3	102.1	111.2	97.6	87.7	99.7
	08	85.9 (.063)	93.3	95.2	101.9	108.6	98.1	90.4	100.0
	09	83.2 (.061)	92.2	93.8	101.8	110.7	99.9	90.2	101.7
	10	80.7 (.059)	89.3	91.0	101.9	110.6	100.5	90.9	102.4
	11	79.3 (.058)	87.8	89.3	101.7	110.7	100.2	90.5	101.9
	12	80.6 (.059)	88.2	89.6	101.5	109.4	100.5	91.8	102.0
2021	01	81.6 (.060)	88.7	90.4	101.9	108.7	100.3	92.3	102.3
	02	81.4 (.060)	90.8	92.4	101.7	111.5	100.2	89.8	101.9
	03	84.5 (.062)	93.7	95.4	101.8	110.8	101.3	91.4	103.1
	04	86.9 (.064)	97.0	99.0	102.0	111.5	101.6	91.1	103.6
	05	90.5 (.066)	100.0	102.0	102.0	110.4	100.0	90.5	102.0
	06	93.0 (.068)	102.3	104.2	101.9	109.9	101.4	92.3	103.3
	07	94.8 (.069)	105.4	107.4	101.9	111.2	101.6	91.4	103.5
	08	97.5 (.071)	107.2	109.0	101.7	109.9	100.3	91.3	102.0
	09	101.6 (.074)	108.7	110.7	101.8	106.9	99.7	93.3	101.5
	10	106.5 (.078)	113.4	115.2	101.5	106.4	101.0	94.9	102.5
	11	106.4 (.078)	116.1	117.8	101.4	109.1	102.1	93.5	103.5
	12	107.7 (.079)	116.9	118.5	101.4	108.5	102.2	94.2	103.6
2022	01	111.8 (.082)	117.3	119.4	101.8	104.8	101.2	96.5	103.0
	02	114.1 (.083)	121.1	123.6	102.0	106.1	100.5	94.7	102.6
	03	111.8 (.082)	123.1	126.2	102.5	110.1	101.3	92.0	103.8
	04	114.6 (.084)	129.1	131.5	101.8	112.7	102.2	90.7	104.1
	05	119.2 (.087)	131.3	133.6	101.7	110.1	101.8	92.4	103.5
	06	122.5 (.090)	135.3	138.0	101.9	110.4	102.6	92.9	104.6
	07	127.2 (.093)	138.7	140.5	101.3	109.0	101.6	93.2	103.0
	08	130.5 (.095)	141.6	144.0	101.7	108.5	102.3	94.2	104.0
	09	130.9 (.096)	143.9	146.2	101.6	109.9	102.2	93.0	103.8
	10	128.9 (.094)	142.7	146.1	102.4	110.7	102.4	92.5	104.8
	11	128.8 (.094)	144.2	148.8	103.2	111.9	102.5	91.6	105.8
	12	132.4 (.097)	147.2	152.2	103.3	111.1	102.5	92.2	105.9
2023	01	129.5 (.095)	145.0	150.7	103.9	111.9	103.1	92.1	107.1
	02	119.5 (.087)	135.9	141.3	104.0	113.7	103.9	91.4	108.0
	03	117.1 (.086)	133.4	139.7	104.7	113.9	103.5	90.9	108.4
	04	115.0 (.084)	132.4	139.8	105.6	115.0	104.4	90.8	110.2
	05	110.2 (.081)	126.7	134.0	105.7	115.0	104.6	91.0	110.6
	06	107.9 (.079)	124.5	132.1	106.1	115.3	104.6	90.8	111.0
	07	106.5 (.078)	120.7	128.6	106.5	113.3	103.5	91.3	110.2
	08	105.1 (.077)	119.9	128.0	106.8	114.0	103.8	91.0	110.8
	09	104.1 (.076)	117.1	124.9	106.6	112.5	103.8	92.3	110.7
	10	102.0 (.075)	118.0	126.2	106.9	115.6	103.8	89.8	111.0
	11	103.2 (.075)	117.9	126.3	107.1	114.2	103.5	90.6	110.9
	12	103.1 (.075)	118.6	127.2	107.2	114.9	104.1	90.5	111.6
2024	01	101.8 (.074)	119.1	127.4	107.0	116.9	102.8	87.9	110.0
	02	103.1 (.075)	119.3	128.0	107.3	115.7	103.4	89.4	110.9
	03	107.9 (.079)	119.0	128.3	107.8	110.3	102.4	92.9	110.4
	04	106.1 (.078)	119.1	128.6	108.0	112.2	102.3	91.2	110.5

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