



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		
	2023Q2	2023Q3	2023Q4	December, 2023	January, 2024	February, 2024
a. RUEC (Real Unit Energy Cost) (=b-c=e-d)	-9.2%	-4.4%	-3.1%	-0.7%	-1.2%	1.9%
b. Real Energy Price (=b1-b2)	-7.4%	-5.6%	-1.5%	0.5%	0.6%	0.2%
b1. Energy Price	-6.0%	-4.8%	-1.1%	0.6%	0.1%	0.4%
b2. GDP Price	1.5%	0.8%	0.4%	0.2%	-0.5%	0.2%
c. Energy Productivity (=c1-c2)	2.0%	-1.3%	1.6%	1.2%	1.8%	-1.7%
c1. Real GDP	1.0%	-0.8%	0.1%	0.4%	-0.8%	0.0%
c2. Energy Consumption	-0.9%	0.5%	-1.5%	-0.8%	-2.6%	1.7%
d. Nominal GDP (=b2*c1)	2.6%	0.0%	0.5%	0.6%	-1.3%	0.2%
e. Energy Cost (=b1*c2)	-6.8%	-4.4%	-2.6%	-0.1%	-2.5%	2.1%

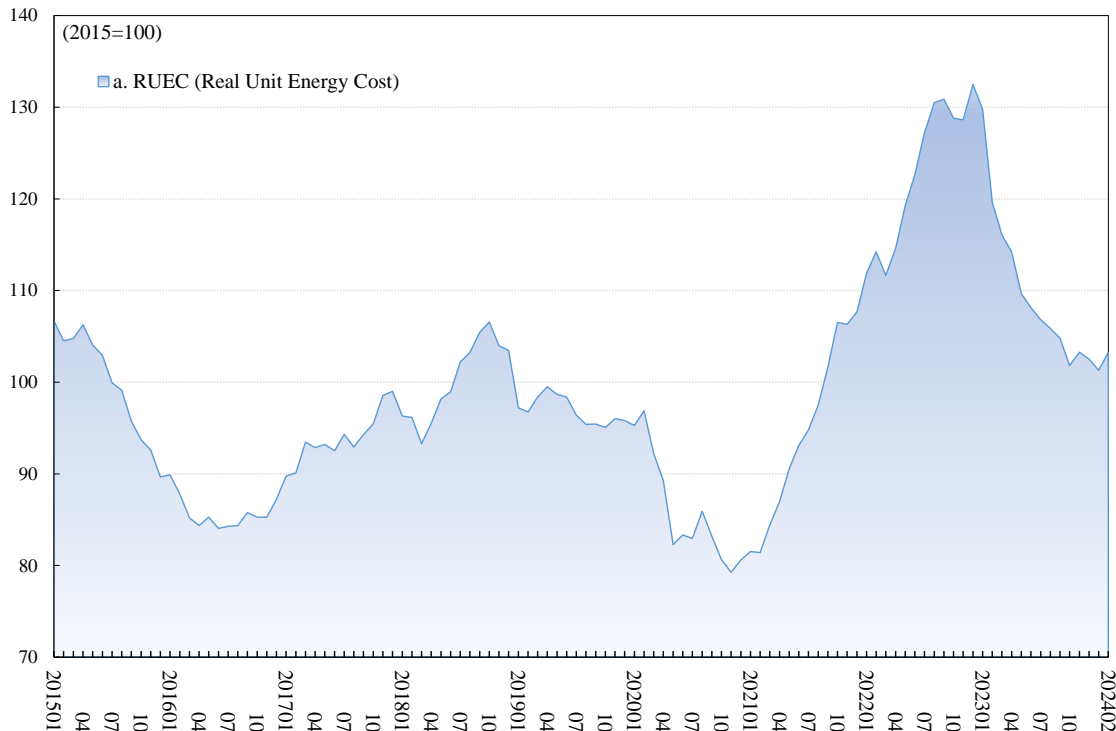
Unit: %. Notes: The most recent month is the forecasts, the previous month is the preliminary estimates, and the last two months or earlier are the final estimates. The aggregate volume indices of real GDP and energy consumption are measured using the translog index, based on the prices and volumes measured 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		
	2023Q2	2023Q3	2023Q4	December, 2023	January, 2024	February, 2024
a. RUEC (Real Unit Energy Cost) (=b/c=e/d)	110.7	105.8	102.5	102.5	101.3	103.2
b. Real Energy Price (=b1/b2)	130.5	123.2	121.4	118.4	119.1	119.3
b1. Energy Price	138.1	131.4	130.0	127.1	127.2	127.7
b2. GDP Price	105.8	106.6	107.1	107.3	106.8	107.0
c. Energy Productivity (=c1/c2)	117.9	116.4	118.3	115.5	117.5	115.5
c1. Real GDP	104.5	103.7	103.8	104.0	103.1	103.1
c2. Energy Consumption	88.7	89.1	87.7	90.1	87.7	89.2
d. Nominal GDP (=b2*c1)	110.6	110.6	111.2	111.5	110.1	110.3
e. Energy Cost (=b1*c2)	122.4	117.0	114.0	114.4	111.6	113.9

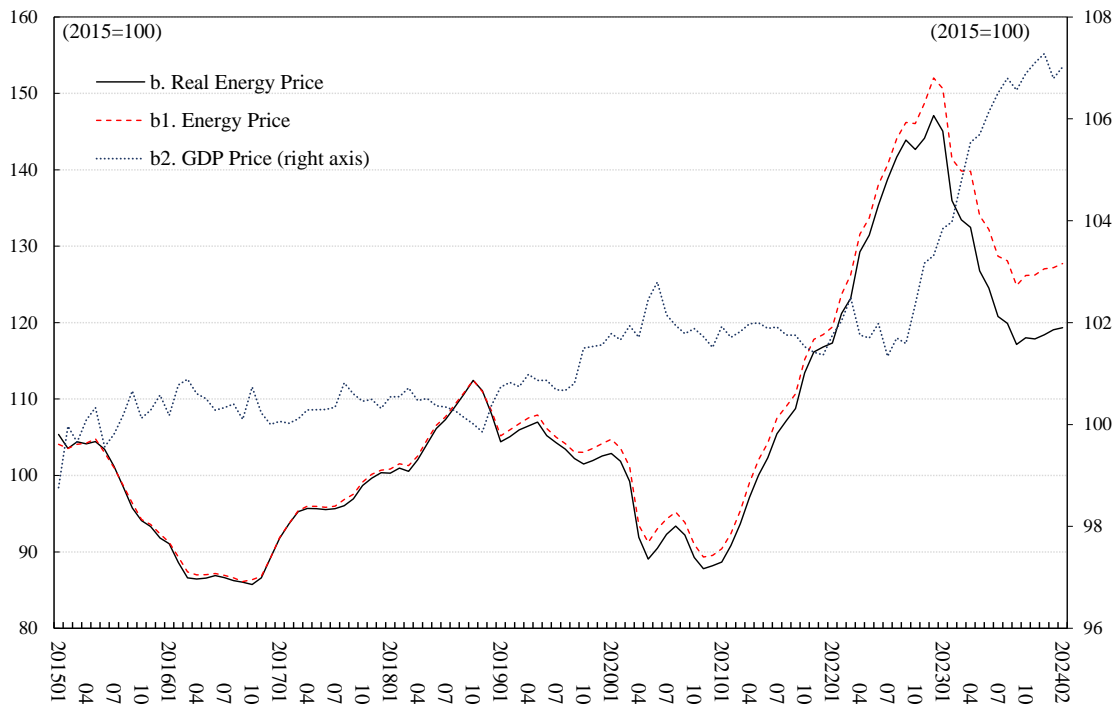
Unit: 2015 average=100.

2 Monthly RUEC (Real Unit Energy Cost)



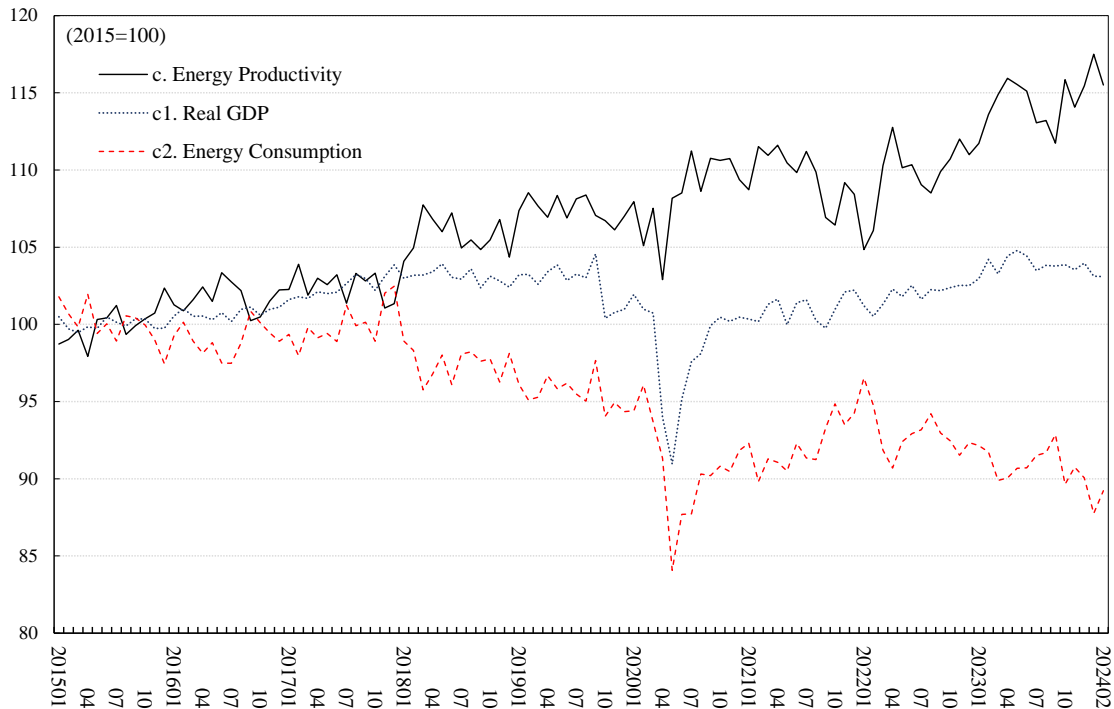
Unit: 2015 average=100. Note: Observation period is from January 2015 to February 2024.

3 Monthly Real Energy Price



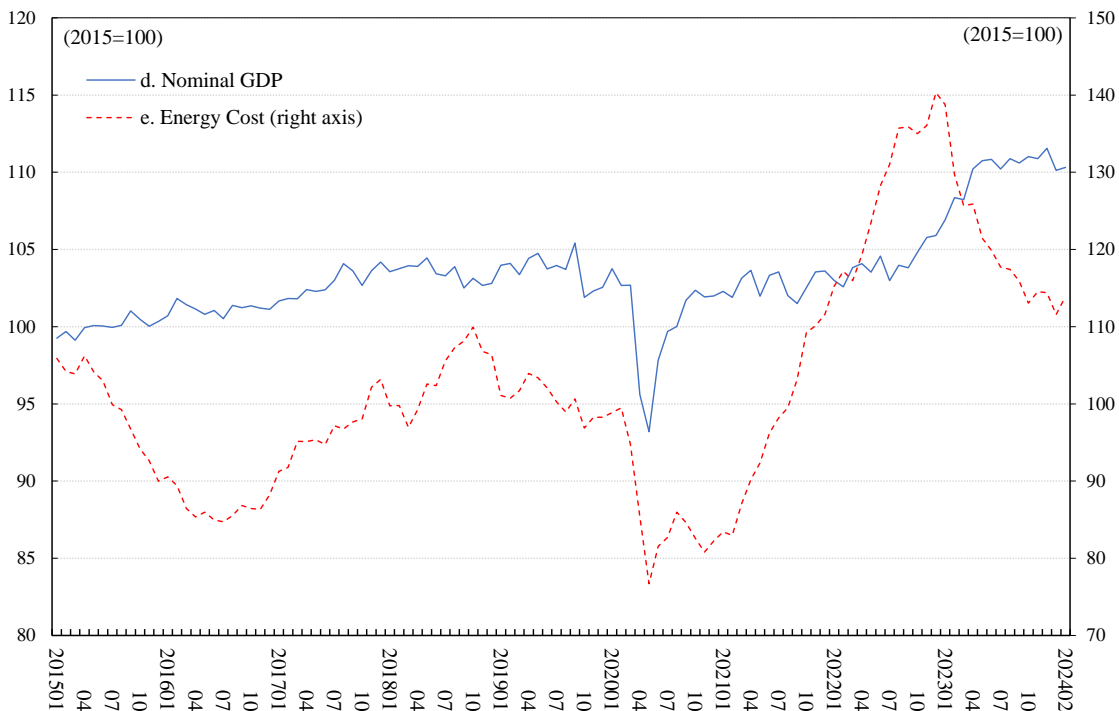
Unit: 2015 average=100. Note: Observation period is from January 2015 to February 2024.

4 Monthly Real GDP and Energy Productivity



Unit: 2015 average=100. Note: Observation period is from January 2015 to February 2024.

5 Monthly Nominal GDP and Energy Cost



Unit: 2015 average=100. Note: Observation period is from January 2015 to February 2024.

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	100.0
2016	85.7 (.063)	87.5	87.9	100.4	102.1	100.7	98.7	101.1	86.7
2017	93.9 (.069)	96.5	96.8	100.3	102.8	102.4	99.7	102.8	96.5
2018	100.3 (.073)	106.2	106.6	100.3	105.9	103.1	97.3	103.4	103.7
2019	96.9 (.071)	104.4	105.5	101.0	107.7	102.7	95.3	103.7	100.5
2020	86.1 (.063)	94.9	96.8	101.9	110.3	98.4	89.2	100.3	86.3
2021	94.4 (.069)	104.8	106.7	101.8	111.0	101.0	90.9	102.8	97.0
2022	122.8 (.090)	137.8	140.7	102.1	112.2	101.9	90.8	104.1	127.8
2023	110.1 (.081)	129.0	136.6	105.9	117.1	103.9	88.7	110.0	121.2
2020 Q1	94.8 (.069)	101.8	103.7	101.8	107.4	101.2	94.2	103.0	97.7
2020 Q2	85.0 (.062)	92.6	94.8	102.3	109.0	93.4	85.7	95.5	81.2
2020 Q3	84.0 (.061)	95.1	97.0	102.0	113.2	98.5	87.0	100.5	84.4
2020 Q4	80.2 (.059)	89.8	91.3	101.7	111.9	100.4	89.7	102.1	81.9
2021 Q1	82.5 (.060)	92.6	94.3	101.8	112.2	100.6	89.7	102.4	84.5
2021 Q2	90.2 (.066)	101.0	103.0	102.0	111.9	101.0	90.3	103.0	92.9
2021 Q3	98.0 (.072)	108.2	110.1	101.8	110.4	100.5	91.1	102.4	100.3
2021 Q4	106.8 (.078)	117.2	118.9	101.4	109.7	101.8	92.8	103.2	110.3
2022 Q1	112.6 (.082)	123.5	126.1	102.1	109.6	101.0	92.1	103.1	116.1
2022 Q2	118.8 (.087)	135.0	137.5	101.8	113.6	102.2	90.0	104.1	123.7
2022 Q3	129.5 (.095)	145.1	147.4	101.5	112.0	102.0	91.1	103.6	134.2
2022 Q4	130.0 (.095)	148.0	152.4	102.9	113.8	102.5	90.0	105.5	137.1
2023 Q1	121.8 (.089)	140.9	146.9	104.2	115.7	103.5	89.5	107.8	131.4
2023 Q2	110.7 (.081)	130.5	138.1	105.8	117.9	104.5	88.7	110.6	122.4
2023 Q3	105.8 (.077)	123.2	131.4	106.6	116.4	103.7	89.1	110.6	117.0
2023 Q4	102.5 (.075)	121.4	130.0	107.1	118.3	103.8	87.7	111.2	114.0
2020 01	95.3 (.070)	102.9	104.7	101.8	108.0	101.9	94.4	103.8	98.9
2020 02	96.9 (.071)	101.9	103.6	101.7	105.1	101.0	96.1	102.7	99.5
2020 03	92.2 (.067)	99.2	101.2	101.9	107.5	100.7	93.7	102.7	94.7
2020 04	89.3 (.065)	91.9	93.5	101.7	102.9	94.0	91.3	95.6	85.4
2020 05	82.3 (.060)	89.1	91.3	102.5	108.2	91.0	84.1	93.2	76.7
2020 06	83.3 (.061)	90.5	93.0	102.8	108.5	95.2	87.7	97.8	81.5
2020 07	82.9 (.061)	92.3	94.3	102.2	111.2	97.6	87.7	99.7	82.7
2020 08	85.9 (.063)	93.4	95.2	101.9	108.6	98.1	90.3	100.0	86.0
2020 09	83.2 (.061)	92.2	93.9	101.8	110.8	99.9	90.2	101.7	84.6
2020 10	80.7 (.059)	89.3	91.0	101.9	110.6	100.5	90.8	102.4	82.6
2020 11	79.2 (.058)	87.8	89.3	101.7	110.7	100.2	90.5	101.9	80.8
2020 12	80.6 (.059)	88.2	89.5	101.5	109.4	100.5	91.8	102.0	82.2
2021 01	81.5 (.060)	88.7	90.4	101.9	108.7	100.4	92.3	102.3	83.4
2021 02	81.4 (.060)	90.8	92.4	101.7	111.5	100.2	89.8	101.9	83.0
2021 03	84.4 (.062)	93.7	95.4	101.8	110.9	101.3	91.3	103.1	87.1
2021 04	87.0 (.064)	97.1	99.1	102.0	111.6	101.6	91.1	103.7	90.2
2021 05	90.5 (.066)	100.1	102.1	102.0	110.5	100.0	90.5	102.0	92.3
2021 06	93.1 (.068)	102.3	104.3	101.9	109.8	101.4	92.3	103.3	96.2
2021 07	94.8 (.069)	105.5	107.5	101.9	111.2	101.6	91.4	103.5	98.2
2021 08	97.5 (.071)	107.2	109.1	101.8	109.9	100.3	91.2	102.0	99.5
2021 09	101.7 (.074)	108.7	110.7	101.8	106.9	99.8	93.3	101.5	103.2
2021 10	106.5 (.078)	113.4	115.2	101.5	106.4	101.0	94.9	102.5	109.2
2021 11	106.3 (.078)	116.1	117.8	101.4	109.2	102.1	93.5	103.6	110.1
2021 12	107.7 (.079)	116.8	118.4	101.4	108.4	102.2	94.3	103.6	111.6
2022 01	111.9 (.082)	117.3	119.4	101.8	104.8	101.2	96.5	103.0	115.2
2022 02	114.2 (.084)	121.2	123.7	102.0	106.1	100.5	94.8	102.6	117.2
2022 03	111.7 (.082)	123.2	126.3	102.5	110.3	101.3	91.9	103.8	115.9
2022 04	114.6 (.084)	129.3	131.6	101.8	112.8	102.3	90.7	104.1	119.3
2022 05	119.3 (.087)	131.4	133.7	101.7	110.2	101.8	92.4	103.5	123.5
2022 06	122.6 (.090)	135.4	138.1	102.0	110.3	102.5	92.9	104.6	128.3
2022 07	127.2 (.093)	138.8	140.6	101.3	109.0	101.6	93.2	103.0	131.0
2022 08	130.5 (.095)	141.7	144.1	101.7	108.5	102.2	94.2	104.0	135.7
2022 09	130.9 (.096)	143.9	146.2	101.6	109.9	102.2	93.0	103.8	135.9
2022 10	128.8 (.094)	142.7	146.0	102.4	110.7	102.4	92.5	104.8	135.0
2022 11	128.6 (.094)	144.1	148.7	103.2	112.0	102.5	91.5	105.8	136.1
2022 12	132.5 (.097)	147.1	152.0	103.3	111.0	102.5	92.3	105.9	140.3
2023 01	129.8 (.095)	145.0	150.6	103.8	111.7	103.0	92.1	106.9	138.8
2023 02	119.7 (.088)	136.0	141.4	104.0	113.6	104.2	91.7	108.4	129.7
2023 03	116.1 (.085)	133.4	139.8	104.8	114.9	103.3	89.9	108.2	125.7
2023 04	114.2 (.083)	132.5	139.8	105.5	115.9	104.4	90.1	110.2	125.9
2023 05	109.7 (.080)	126.8	134.0	105.7	115.5	104.8	90.7	110.7	121.5
2023 06	108.1 (.079)	124.5	132.2	106.1	115.1	104.4	90.7	110.8	119.9
2023 07	106.8 (.078)	120.8	128.7	106.5	113.1	103.5	91.5	110.2	117.7
2023 08	105.9 (.077)	119.9	128.1	106.8	113.2	103.8	91.7	110.9	117.4
2023 09	104.8 (.077)	117.1	124.9	106.6	111.7	103.8	92.9	110.6	115.9
2023 10	101.8 (.074)	118.0	126.2	106.9	115.9	103.9	89.6	111.0	113.1
2023 11	103.3 (.076)	117.9	126.2	107.1	114.1	103.5	90.8	110.9	114.5
2023 12	102.5 (.075)	118.4	127.1	107.3	115.5	104.0	90.1	111.5	114.4
2024 01	101.3 (.074)	119.1	127.2	106.8	117.5	103.1	87.7	110.1	111.6
2024 02	103.2 (.075)	119.3	127.7	107.0	115.5	103.1	89.2	110.3	113.9

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