



Energy Cost Monitoring (ECM)

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

ECM_JPN_202301

January 31, 2023

(This report was prepared by Koji Nomura, Sho Inaba, and Mintsu Takagi.)

1 Recent Estimates

1.1 Growth Rates

	Quarter-over-quarter growth rate			Month-over-month growth rate		
	2022Q2	2022Q3	2022Q4	October, 2022	November, 2022	December, 2022
a. RUEC (Real Unit Energy Cost) (=b-c=e-d)	2.8%	4.4%	1.1%	-2.0%	0.9%	3.1%
b. Real Energy Price (=b1-b2)	8.2%	5.2%	2.6%	-1.1%	1.8%	2.1%
b1. Energy Price	8.6%	5.7%	3.9%	-0.3%	2.5%	2.2%
b2. GDP Price	0.4%	0.5%	1.3%	0.8%	0.7%	0.2%
c. Energy Productivity (=c1-c2)	5.2%	0.8%	1.5%	1.0%	0.9%	-1.0%
c1. Real GDP	1.0%	0.8%	-0.6%	-0.4%	-0.1%	0.1%
c2. Energy Consumption	-4.0%	0.1%	-2.0%	-1.4%	-1.1%	1.1%
d. Nominal GDP (=b2*c1)	1.4%	1.3%	0.7%	0.3%	0.6%	0.3%
e. Energy Cost (=b1*c2)	4.3%	5.8%	1.8%	-1.7%	1.4%	3.4%

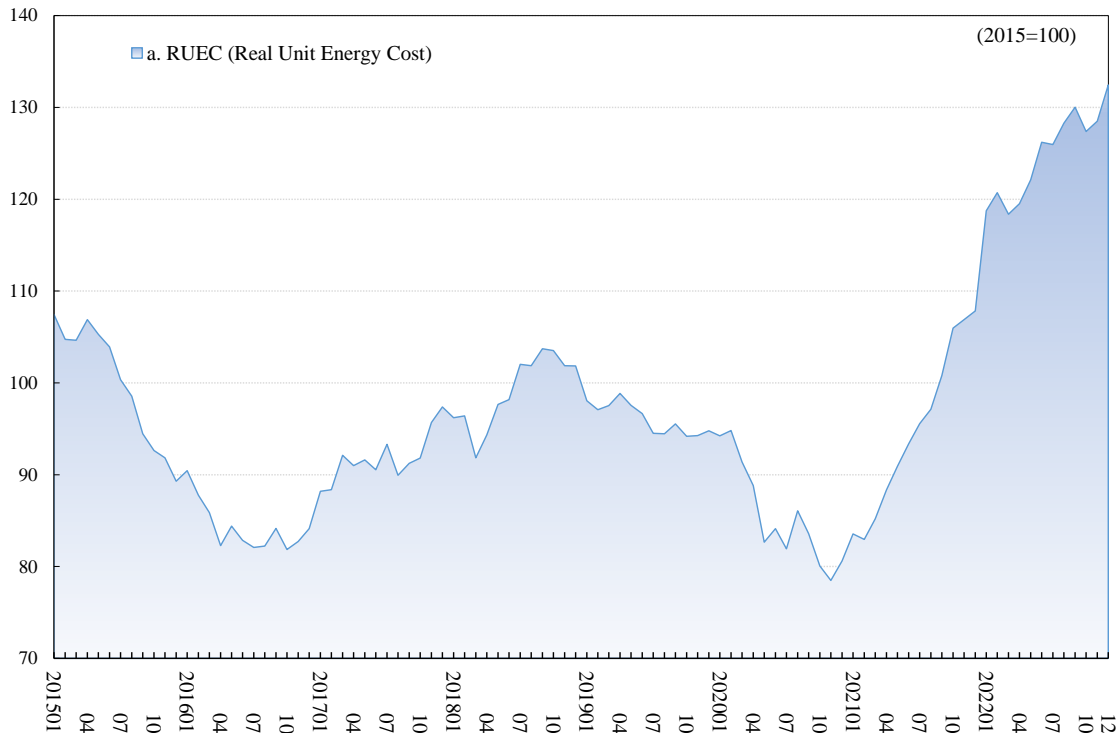
Unit: %. Notes: The most recent month is the forecasts, the previous month is the preliminary estimates, and the last two months or earlier are the final estimates. The aggregate volume indices of real GDP and energy consumption are measured using the Chained-Laspeyres index, based on the prices and volumes measured at 36 industries and 21 types of energy, respectively. The aggregate price indices of real GDP and energy consumption are defined implicitly.

1.2 Indices

	Quarterly index			Monthly index		
	2022Q2	2022Q3	2022Q4	October, 2022	November, 2022	December, 2022
a. RUEC (Real Unit Energy Cost) (=b/c=e/d)	122.6	128.1	129.4	127.4	128.5	132.4
b. Real Energy Price (=b1/b2)	132.7	139.6	143.2	140.5	143.0	146.0
b1. Energy Price	135.9	143.7	149.3	145.7	149.4	152.8
b2. GDP Price	102.4	102.9	104.2	103.7	104.4	104.6
c. Energy Productivity (=c1/c2)	108.1	108.9	110.6	110.2	111.2	110.2
c1. Real GDP	101.7	102.6	101.9	102.0	101.9	102.0
c2. Energy Consumption	94.1	94.1	92.2	92.5	91.5	92.5
d. Nominal GDP (=b2*c1)	104.2	105.5	106.3	105.8	106.4	106.7
e. Energy Cost (=b1*c2)	127.8	135.2	137.6	134.8	136.7	141.3

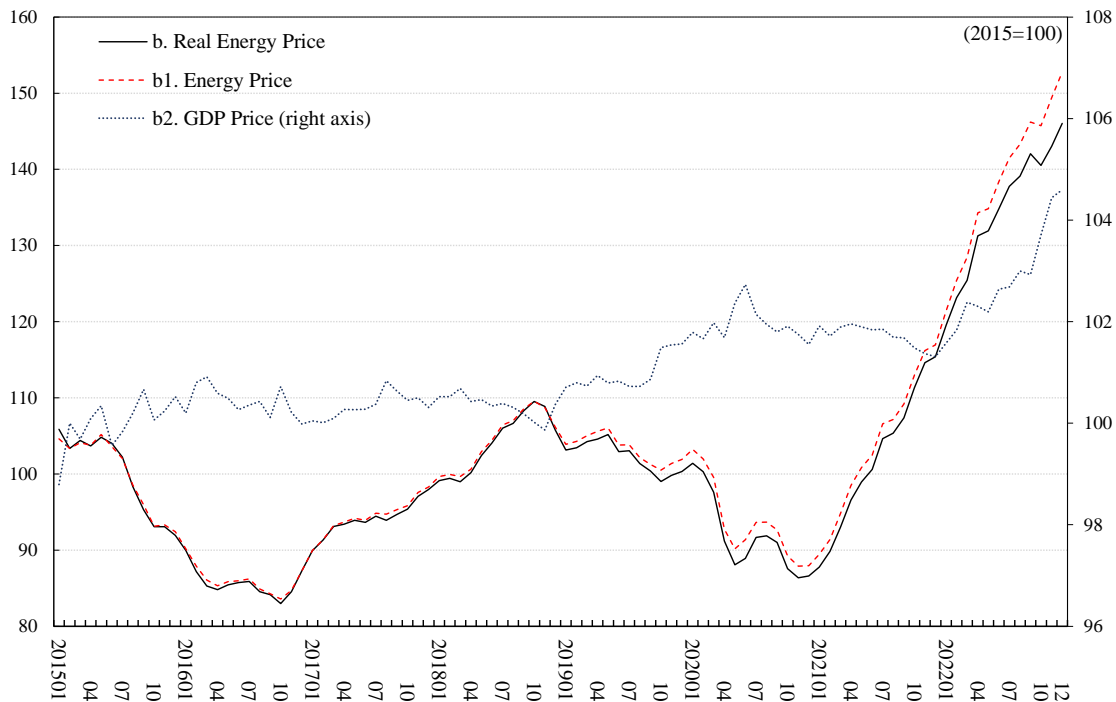
Unit: 2015 average=100.

2 Monthly RUEC (Real Unit Energy Cost)



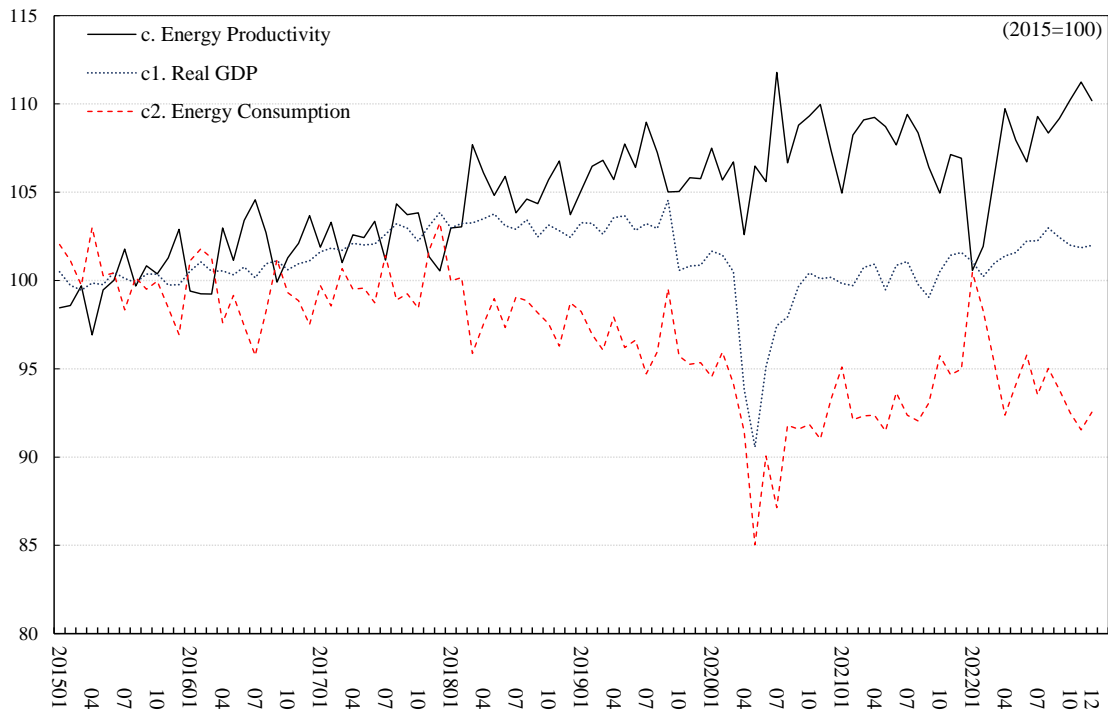
Unit: 2015 average=100. Note: Observation period is from January 2015 to December 2022.

3 Monthly Real Energy Price



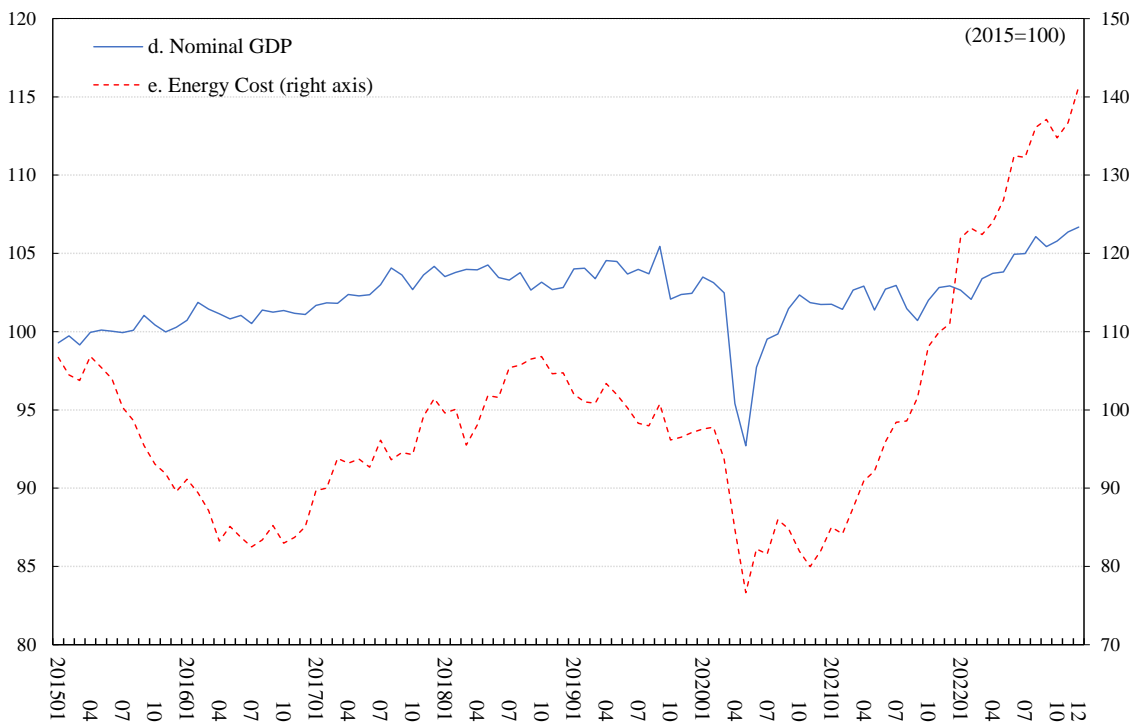
Unit: 2015 average=100. Note: Observation period is from January 2015 to December 2022.

4 Monthly Real GDP and Energy Productivity



Unit: 2015 average=100. Note: Observation period is from January 2015 to December 2022.

5 Monthly Nominal GDP and Energy Cost



Unit: 2015 average=100. Note: Observation period is from January 2015 to December 2022.

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		cl. Real GDP	cl. Energy Consumption		
2015		100.0 (.074)	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2016		84.2 (.063)	86.2	86.5	100.4	102.3	100.7	98.5	101.1
2017		91.8 (.068)	94.6	94.9	100.3	103.0	102.4	99.4	102.8
2018		99.1 (.074)	105.2	105.5	100.3	106.1	103.1	97.2	103.4
2019		96.1 (.071)	103.6	104.6	101.0	107.8	102.7	95.3	103.7
2020		85.6 (.064)	94.2	96.0	101.9	110.0	98.2	89.3	100.1
2021		94.9 (.070)	103.6	105.4	101.7	109.1	100.4	92.0	102.1
2022		124.9 (.093)	138.0	142.0	102.9	110.5	101.7	92.1	104.7
2020	Q1	93.5 (.069)	99.8	101.6	101.8	106.6	101.2	94.9	103.0
	Q2	85.2 (.063)	89.4	91.5	102.3	104.9	93.2	88.8	95.3
	Q3	83.9 (.062)	91.5	93.3	102.0	109.1	98.3	90.2	100.3
	Q4	79.7 (.059)	86.9	88.4	101.7	108.9	100.2	92.1	102.0
2021	Q1	83.9 (.062)	90.2	91.9	101.8	107.4	100.1	93.2	101.9
	Q2	90.9 (.067)	98.7	100.6	101.9	108.6	100.4	92.5	102.3
	Q3	97.8 (.073)	105.8	107.6	101.7	108.1	100.0	92.5	101.7
	Q4	106.9 (.079)	113.8	115.4	101.4	106.3	101.2	95.1	102.6
2022	Q1	119.3 (.089)	122.7	125.1	101.9	102.8	100.8	98.0	102.7
	Q2	122.6 (.091)	132.7	135.9	102.4	108.1	101.7	94.1	104.2
	Q3	128.1 (.095)	139.6	143.7	102.9	108.9	102.6	94.1	105.5
	Q4	129.4 (.096)	143.2	149.3	104.2	110.6	101.9	92.2	106.3
2020	01	94.2 (.070)	101.4	103.2	101.8	107.5	101.7	94.5	103.5
	02	94.8 (.070)	100.3	102.0	101.7	105.7	101.4	95.9	103.1
	03	91.4 (.068)	97.6	99.5	102.0	106.7	100.5	94.1	102.5
	04	88.8 (.066)	91.2	92.8	101.7	102.6	93.8	91.4	95.4
	05	82.7 (.061)	88.1	90.2	102.4	106.5	90.6	85.0	92.7
	06	84.1 (.062)	88.9	91.4	102.7	105.6	95.1	90.1	97.7
	07	81.9 (.061)	91.7	93.6	102.1	111.8	97.4	87.1	99.5
	08	86.1 (.064)	91.9	93.7	101.9	106.7	97.9	91.8	99.8
	09	83.6 (.062)	91.0	92.7	101.8	108.8	99.7	91.6	101.5
	10	80.0 (.059)	87.6	89.3	101.9	109.3	100.4	91.9	102.3
	11	78.5 (.058)	86.4	87.9	101.7	110.0	100.1	91.0	101.9
	12	80.6 (.060)	86.6	88.0	101.5	107.4	100.2	93.3	101.7
2021	01	83.6 (.062)	87.8	89.5	101.9	105.0	99.8	95.1	101.7
	02	82.9 (.062)	89.8	91.4	101.7	108.2	99.7	92.1	101.4
	03	85.2 (.063)	93.0	94.8	101.9	109.1	100.7	92.3	102.7
	04	88.4 (.066)	96.6	98.5	102.0	109.2	100.9	92.4	102.9
	05	90.9 (.068)	98.9	100.8	101.9	108.7	99.5	91.5	101.4
	06	93.4 (.069)	100.6	102.5	101.8	107.7	100.9	93.6	102.7
	07	95.6 (.071)	104.6	106.6	101.8	109.4	101.1	92.4	103.0
	08	97.1 (.072)	105.3	107.1	101.7	108.4	99.8	92.1	101.5
	09	100.8 (.075)	107.4	109.2	101.7	106.4	99.1	93.1	100.7
	10	106.0 (.079)	111.3	113.0	101.5	105.0	100.5	95.7	102.0
	11	106.9 (.079)	114.6	116.2	101.4	107.1	101.4	94.7	102.8
	12	107.8 (.080)	115.4	116.9	101.3	106.9	101.6	95.0	102.9
2022	01	118.8 (.088)	119.5	121.4	101.6	100.6	101.1	100.5	102.7
	02	120.7 (.090)	123.1	125.4	101.8	101.9	100.2	98.3	102.1
	03	118.4 (.088)	125.4	128.4	102.4	105.9	101.0	95.3	103.4
	04	119.5 (.089)	131.3	134.3	102.3	109.7	101.4	92.4	103.7
	05	122.1 (.091)	131.9	134.8	102.2	107.9	101.6	94.1	103.8
	06	126.2 (.094)	134.8	138.4	102.6	106.7	102.2	95.8	104.9
	07	126.0 (.094)	137.8	141.5	102.7	109.3	102.2	93.5	105.0
	08	128.3 (.095)	139.1	143.3	103.0	108.3	103.0	95.0	106.1
	09	130.0 (.097)	142.0	146.2	102.9	109.2	102.4	93.8	105.4
	10	127.4 (.095)	140.5	145.7	103.7	110.2	102.0	92.5	105.8
	11	128.5 (.095)	143.0	149.4	104.4	111.2	101.9	91.5	106.4
	12	132.4 (.098)	146.0	152.8	104.6	110.2	102.0	92.5	106.7

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