

# OR Annual Report 2021

## Appendices



District heating utilities, hot water supply, water quality and water levels in low-temperature geothermal fields



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# OR and subsidiaries' area of operations



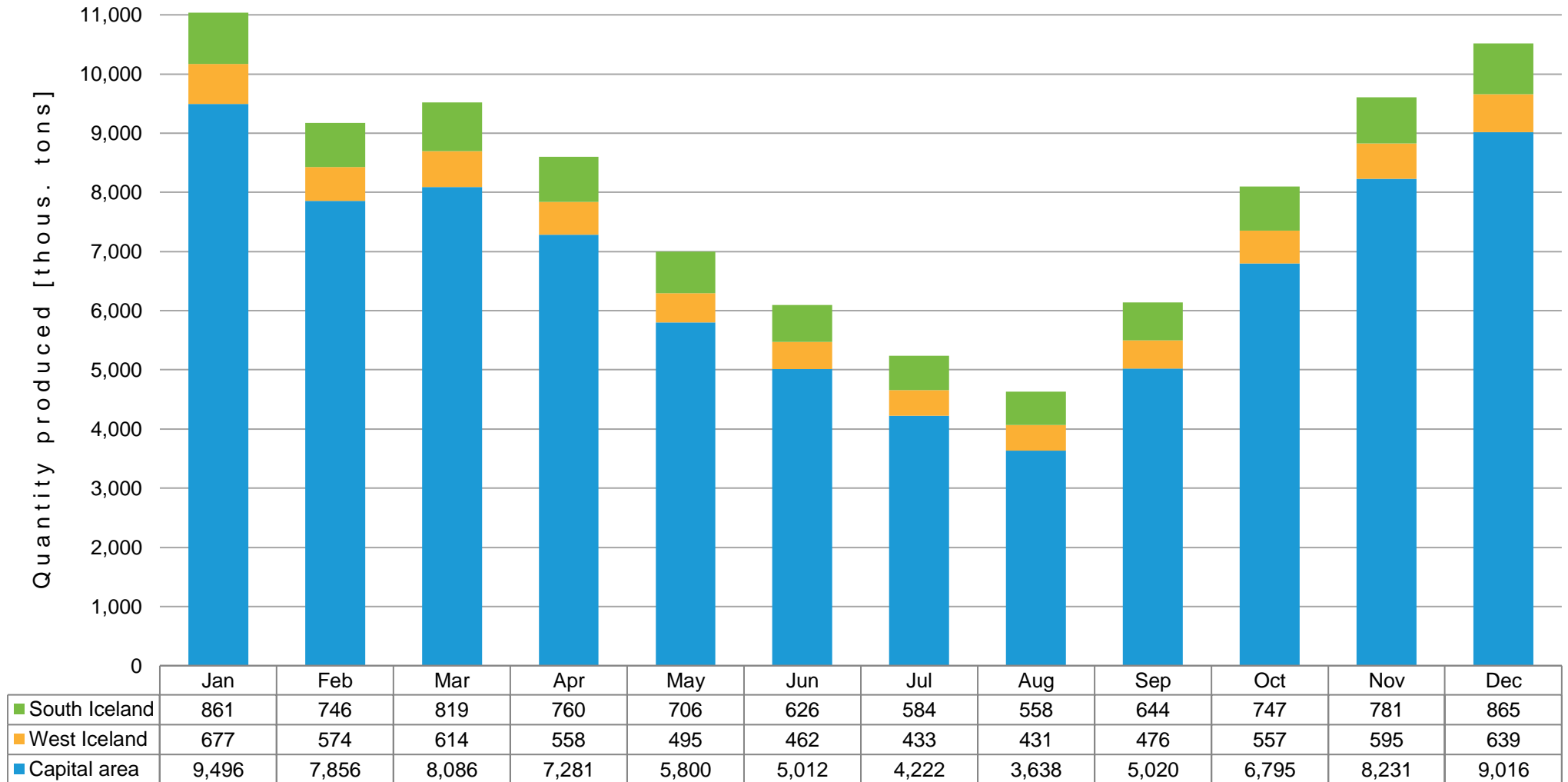
## District heating utilities of Veitur Utilities 2021

Veitur's heating utilities with quantities of water produced, comments and improvements. Some actions were undertaken in West and South Iceland to ensure the operability of district heating utilities. Numbers in table are rounded to the nearest thousand tons.

Utility	Production field	No. of wells	Annual production thous. tons	L/s	Comments	Improvements
<b>Capital area</b>						
Capital area	Laugarnes	10	4,632	147	Field rested for part of summer	
	Ellidaar	7	1,744	55	Field rested for part of summer	
	Reykir	21	13,425	426	Wholesale to Mosfellsbaer	
	Reykjahlid	12	11,589	367	Wholesale to Mosfellsbaer	
	Nesjavellir	18	28,251	896		
	Hellisheidi	31	20,809	660		Thermal production capacity increased by 50%
<b>West Iceland</b>						
HAB	Deildartunga hot spring	1	4,059	129		Further research to provide hot water to continue in 2022
	Wells at Baeir	2	606	19		
Skorradalur	Well in Stora Drageyri	1	370	12		
Munadarnes	Well in Munadarnes	1	219	7		
Nordurardalur Utility	Wells at Svartagil	3	489	16		
	Well at Bifrost	1	0	0		
Stykkisholmur	Wells in Stykkisholmur	2	767	24	One injection well and back-up power	
<b>South Iceland</b>						
Hveragerdi	Wells in Hveragerdi	2	1,141	36	Steam utility and closed-circuit systems	Work on improvements regarding the reservoir
Olfus	Bakki II	1	177	6	Production capacity increased	
Thorlakshofn	Bakki I	2	1,534	49	Production capacity increased	
Austurveita Utility	Wells in Gljufuraraholt	3	476	15	Most of the water used in Hveragerdi.	
Grimsnes Utility	Wells in Ondverdarnes	3	1,907	60	Production capacity increased	Two wells in process of utilization
Hlidarveita Utlity	Wells at Efri-Reykir	1	590	19	The well provides water for two utilities	
Ranga Utility	Wells at Kaldarholt	2	2,280	72		Work on production capacity and prepare research to provide hot water
	Wells at Laugaland	2	588	19		

## Hot water supplied by Veitur Utilities per month in its distribution area in 2021

Granting everyone access to a hot water utility with negligible outages is one of the prerequisites for the health of residents and flourishing economic activity in a modern society, as stated in the Sustainable Development Goals (SDGs) of the United Nations.



# Chemical analyses of hot water in the capital area 2021

By analysing the chemical properties in wells, it can be monitored how production fields react to utilization.

	Unit	Laugarnes RV-5	Ellidaar RV-23	Reykir MG-25	Reykjahlid MG-39	Nesjavellir Heated groundwater	Hellisheidi Heated groundwater
Date		6.1.2021	1.2.2021	8.2.2021	19.2.2021	3.2.2021	28.1.2021
Sample no.		21-5008	21-5032	21-5046	21-5056	21-5038	21-5031
Water temp.	°C	128	83	86.9	92.3	80	80
Flow rate	L/s	33	43.6	31.8	75.7		
pH (acidity)	pH	9.53	9.47	9.67	9.75	8.67	8.02
CO <sub>2</sub>	mg/kg	16.1	26.4	22.9	24.8	44.0	23.3
H <sub>2</sub> S	mg/kg	0.34	0.01	0.75	1.23		0.29
SiO <sub>2</sub>	mg/kg	148.3	70.7	92.4	99.0	42.4	25.0
Na	mg/kg	70.9	41.0	42.7	47.3	16.5	5.2
K	mg/kg	3.15	0.96	0.89	1.18	2.36	0.66
Ca	mg/kg	3.58	3.56	2.46	1.95	10.67	5.17
Mg	mg/kg	0.002	0.007	0.0002	0.001	5.704	2.959
Fe	mg/kg	0.009	0.016	0.005	0.002	0.005	0.002
Al	mg/kg	0.218	0.118	0.168	0.204	0.065	0.001
Cl	mg/kg	53.0	26.3	18.0	14.0	15.1	7.6
SO <sub>4</sub>	mg/kg	25.5	13.3	17.1	17.6	14.6	3.8
F	mg/kg	0.879	0.25	0.69	0.801	0.174	0.097
B	mg/kg	0.049	0.010	0.035	0.041	0.089	< 0.01
Dissolved O <sub>2</sub>	µg/kg	0	250	0	0	0	0



# Chemical analyses of hot water in South and West Iceland 2021

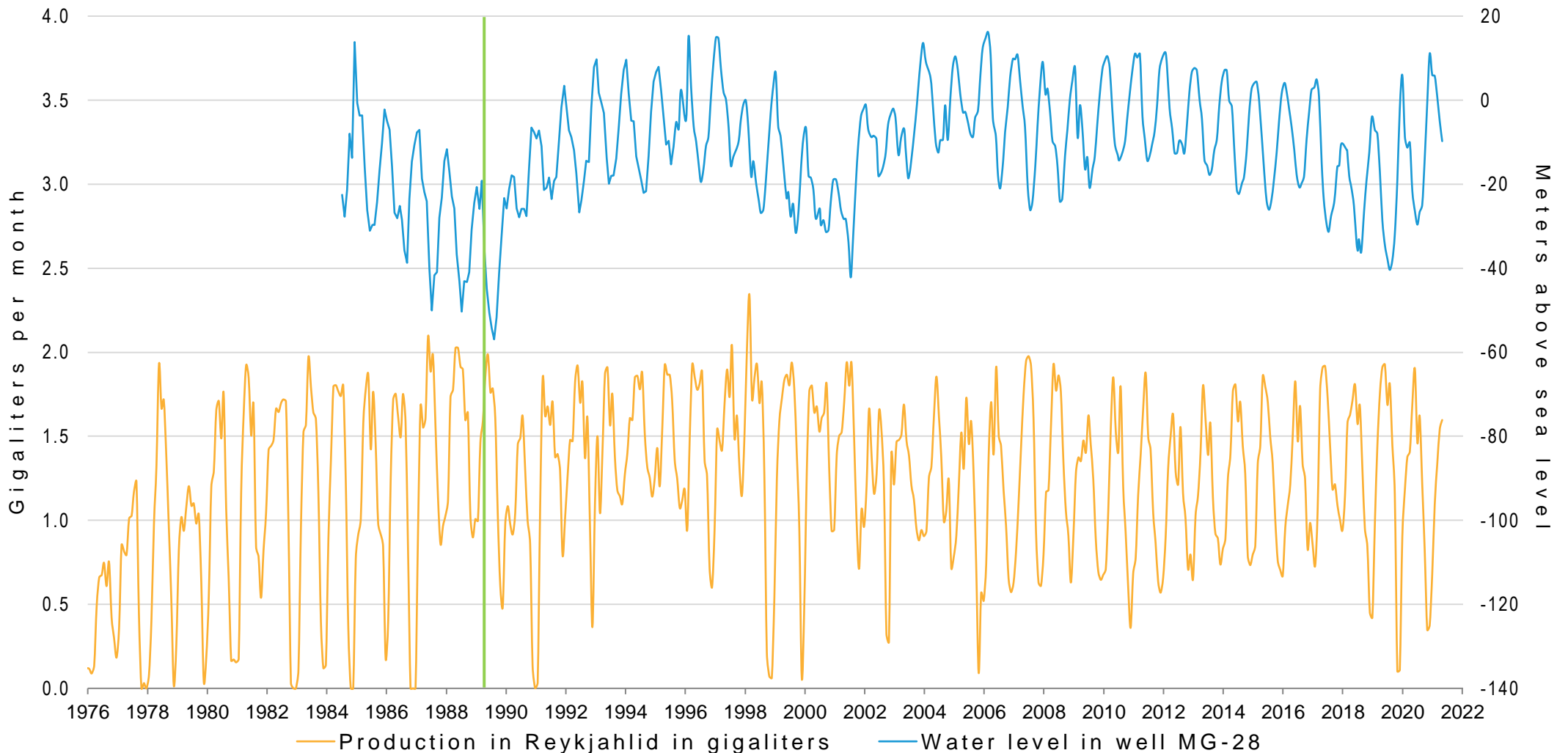
By analysing the chemical properties in wells, it can be monitored how production fields react to utilization.

	Akranes and Borgarfjörður heating utility		Rangá utility			Thorlaks-höfn utility	Ölfus utility	Austur-veita utility	Grimsnæs utility	Hlídar-veita utility	Munadarnes utility	Norðurárdalur utility		Stykkisholmur utility
	Unit	Deildartunga hot spring	LH-1	KH-37	LL-6	BA-01	EB-01	GH-4	ÖN-29	ER-23	MN-8	SG-3	BI-3	HO-1
Date		4.2.2021	4.2.2021	19.1.2021	19.1.2021	20.1.2021	19.1.2021	22.2.2021	25.2.2021	22.2.2021	4.2.2021	4.2.2021	5.2.2020	9.2.2021
Sample no.		21-5043	21-5042	21-5024	21-5022	21-5027	21-5025	21-5062	21-5064	21-5059	21-5040	21-5041	20-5065	21-5049
Water temp.	°C	97.6	88.9	65.5	90.0	124.2	121.5	115.1	80.7		88.4	69.2	66.5	85.2
Flow rate	L/s	155.5	35.9	43.3	32.7	10.6	6.0	8.8	51.5	26.7	7.3	11.9	4.9	32
pH (acidity)	pH	9.46	9.20	10.35	9.81	8.74	8.89	8.90	9.49	9.48	9.38	8.86	9.15	8.25
CO <sub>2</sub>	µS/cm	25.0	13.1	10.6	18.9	8.6	7.5	40.9	14.5	25.6	14.2	81.2	67.6	5
H <sub>2</sub> S	°C	1.25	0.76	0.14	0.08	0.78	0.62	0.16	0.00	3.47	0.47	0.02	0.034	0.061
SiO <sub>2</sub>	mg/kg	131.9	113.9	91.0	95.7	119.3	117.3	137.5	85.3	230.9	114.5	102.2	104.74	64.8
Na	mg/kg	76.9	112.2	69.7	94.4	383.6	277.4	126.5	109.1	108.3	89.8	73.2	76.39	739.28
K	mg/kg	2.37	2.97	0.79	2.02	19.11	13.45	4.50	3.13	6.54	2.57	1.20	1.16	19.4
Ca	mg/kg	3.11	13.77	2.84	3.05	70.48	42.68	4.54	6.82	1.96	6.94	3.45	3.41	1062.86
Mg	mg/kg	0.003	0.004	0.003	0.010	0.011	0.008	0.005	0.009	0.001	0.005	0.013	0.02	0.468
Fe	mg/kg	0.01	0.004	0.005	0.022	0.011	0.007	0.018	0.036	0.016	0.019	0.008	0.013	0.006
Al	mg/kg	0.143	0.020	0.129	0.216	0.061	0.082	0.156	0.073	0.501	0.053	0.016	0.017	0.006
Cl	mg/kg	35.8	116.8	28.5	49.3	609.7	427.6	121.0	120.2	60.2	73.7	27.0	25.69	2889.87
SO <sub>4</sub>	mg/kg	56.5	74.2	23.8	67.8	111.4	129.5	55.7	45.3	59.8	57.6	31.8	31.8	332.59
F	mg/kg	2.668	2.125	2.318	0.982	0.408	0.468	0.926	0.662	2.79	1.893	0.609	0.671	1.505
B	mg/kg	0.256	0.22	0.113	0.235	0.227	0.235	0.297	0.113	0.178	0.222	0.193		0.079
Dissolved O <sub>2</sub>	mg/kg	0	0	0	0	0	0	0	0	0	0	0	0	0

# Water production and water levels in wells in the low-temperature fields of Veitur Utilities in the capital area

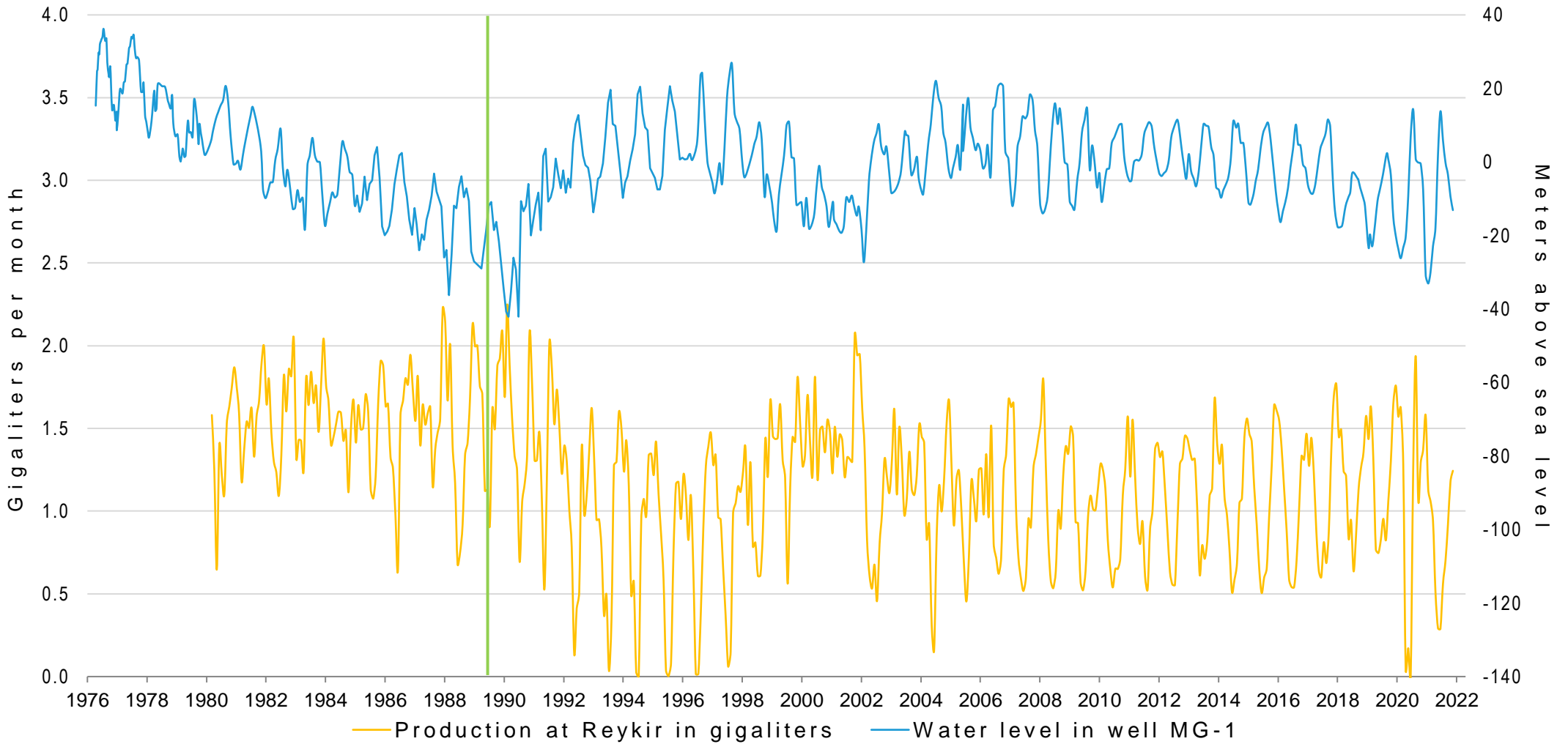
By measuring water levels and quantity of water produced it is monitored how production fields react to utilization. In the greater capital area, there are the production fields of Reykjahlid and Reykir in Mosfellsbaer and Ellidaardalur and Laugarnes in Reykjavik. The vertical green line marks when the thermal plant at the Nesjavellir geothermal power plant began operations. As a result, water production in low-temperature fields in the capital area was significantly reduced, which positively affected water levels in production fields.

## Reykjahlid

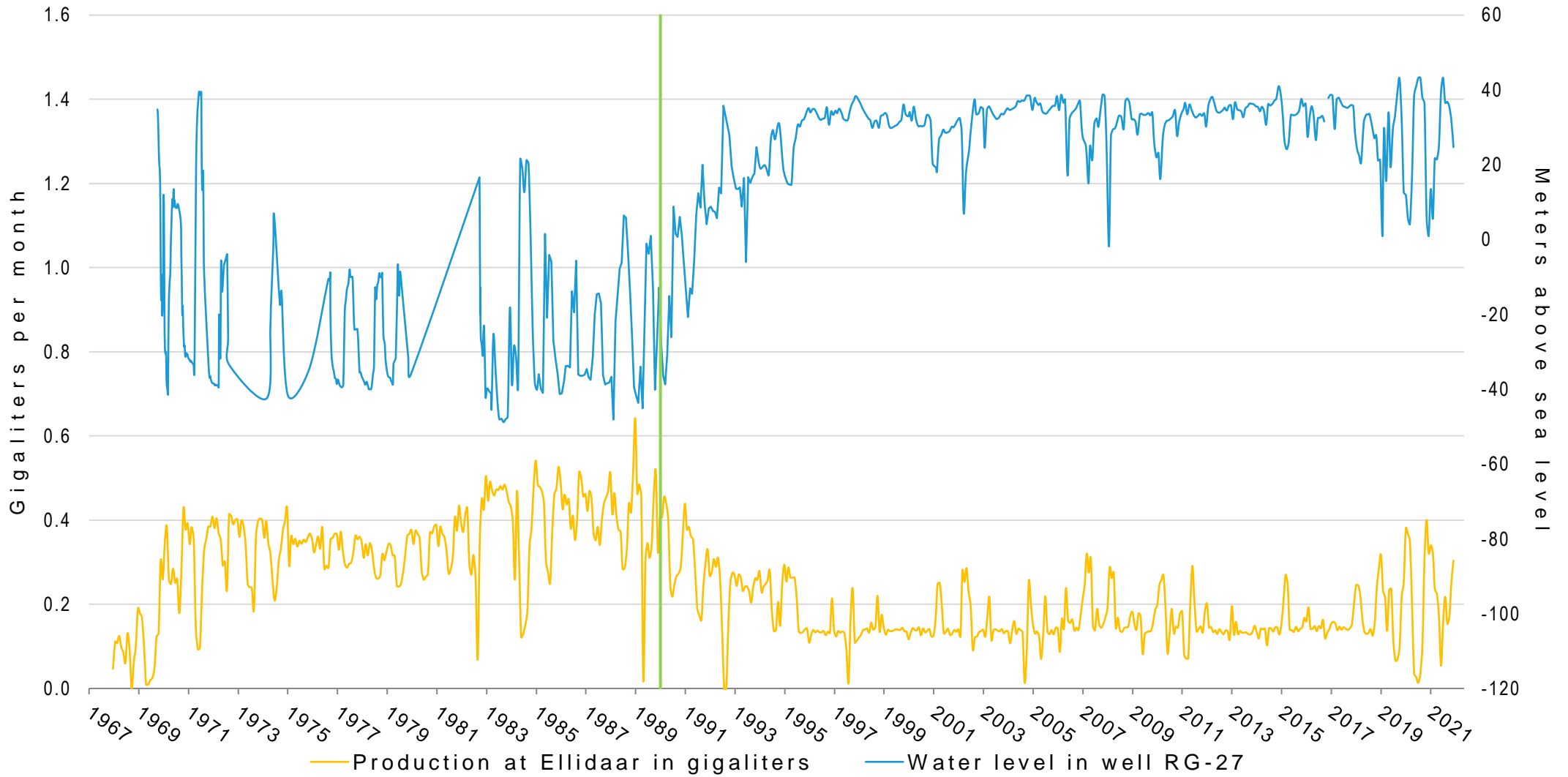




# Reykir



# Ellidaar



# Laugarnes

