

# OR Annual report 2020

## Appendices



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



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# RE and subsidiaries' area of operations



# District heating utilities of Veitur Utilities 2020

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		Comments	Improvements
			thous. tons	l/s		
<b>Capital area</b>						
Capital area	Laugarnes	10	4,250	134	Field rested for part of summer	
	Ellidaar	7	2,396	76	Field rested for part of summer	
	Reykir	22	15,087	477	Wholesale to Mosfellsbaer	
	Reykjahlid	12	14,361	454	Wholesale to Mosfellsbaer	
	Nesjavellir	18	31,651	1,001		
	Hellisheidi	31	15,801	500		Thermal production capacity increased by 50%
<b>West Iceland</b>						
HAB	Deildartunga hot spring	1	4,168	132		Further research to provide hot water to continue in 2021
	Wells at Baeir	2	466	15		
Skorradalur	Well in Stora Drageyri	1	259	8		
Munadarnes	Well in Munadarnes	1	236	7		
Nordurardalur Utility	Well in Svartagil	3	412	13		
	Well at Bifrost	1	74	2		
Stykkisholmur	Wells in Stykkisholmur	2	785	25	One injection well and back-up power	
<b>South Iceland</b>						
Hveragerdi	Wells in Hveragerdi	2	3,877	123	Steam utility and closed-circuit systems	Work on improvements regarding the reservoir
Olfus	Bakki II	1	145	5	Increasing demand	
Thorlakshofn	Bakki I	2	1,489	47	Increasing demand	
Austurveita Utility	Wells in Gljufurholt	3	477	15	Most of the water used in Hveragerdi. Cold water shortage limits production capability.	
Grimsnes Utility	Wells in Ondverdarnes	3	1,876	59	Two wells in use	Two wells in process of utilization
Hlidarveita Utility	Wells at Efri-Reykir	1	498	16	The well provides water for two utilities	
Ranga Utility	Wells at Kaldarholt	2	2,189	69		Work on production capacity and prepare research to provide hot water
	Wells at Laugaland	2	582	18		

## Hot water supplied by Veitur Utilities per month in its distribution area in 2020

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 2020

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		13.1.2020	19.2.2020	4.2.2020	20.1.2020	28.7.2020	29.7.2020
Sample no.		20-5012	20-5090	20-5061	20-5022	20-5342	20-5350
Water temp.	°C	127.7	90.4	90.1	92.2	80	80
Acidity	pH	9.50	9.61	9.75	9.81	8.58	7.12
pH-temp.	°C	22.7	22.9	21.6	22.1	17.7	25.7
Conductivity	µS/cm	408	233	231	246	189.8	89.7
Conduct.temp.	°C	22.2	22.2	22.2	20.9	23.0	23.0
CO <sub>2</sub>	mg/kg	18.8	27.7	28.6	27.2	50.6	29.8
H <sub>2</sub> S	mg/kg	0.52	0.02	0.78	1.29	0.58	0.63
SiO <sub>2</sub>	mg/kg	142.6	91.1	96.6	97.4	42.5	25.0
Na	mg/kg	76.5	46.1	44.9	47.8	18.4	6.6
K	mg/kg	3.10	1.09	0.88	1.12	2.67	1.13
Ca	mg/kg	4.36	2.71	2.47	1.82	9.34	4.65
Mg	mg/kg	<0.01	0.0200	0.0300	<0.01	4.6	2.69
Fe	mg/kg	0.021	0.143	0.095	0.017	<0.005	0.01
Al	mg/kg	0.183	0.16	0.203	0.176	0.084	<0.01
Cl	mg/kg	65.1	23.0	16.4	13.4	14.1	6.8
SO <sub>4</sub>	mg/kg	47.4	13.7	17.0	18.3	13.8	3.7
F	mg/kg	0.964	0.423	0.734	0.792	0.129	0.089
B	mg/kg	0.065		0.039	0.040		
Dissolved O <sub>2</sub>	µg/kg	0	300	0	0	0	0

# Chemical analyses of hot water in South and West Iceland 2020

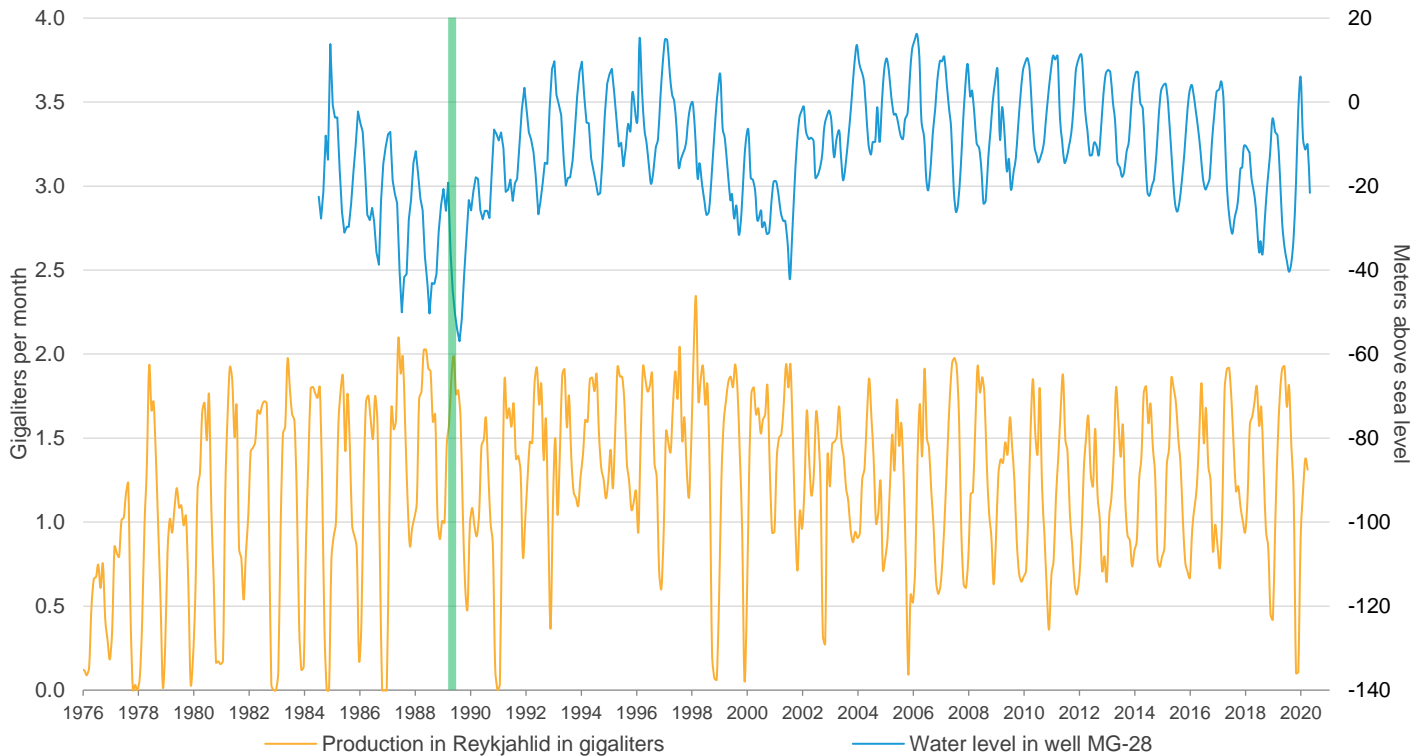
By analysing the chemical properties in wells, it can be monitored how production fields react to utilization.

	Unit	Akranes and Borgarfjörður heating utility		Rangá utility		Thorlaks-höfn utility	Ölfus utility	Austur-veita utility	Grimsnæs utility	Hlídar-veita utility	Munadarnæs utility	Norðurárdalur utility		Stykkisholmur utility
		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		5.2.2020	5.2.2020	6.2.2020	21.2.2020	8.1.2020	8.1.2020	28.1.2020	22.1.2020	3.2.2020	5.2.2020	5.2.2020	5.2.2020	16.1.2020
Sample no.		20-5066	20-5067	20-5070	20-5068	20-5005	20-5006	20-5055	20-5029	20-5059	20-5063	20-5064	20-5065	20-5020
Water temp.	°C	98.9	96.5	65.6	94.4	124.6	121.1	115.2	81.0	94.0	88.3	66.9	66.5	85.2
Acidity	pH	9.52	9.25	10.41	9.86	8.78	8.88	8.94	9.53	9.51	9.45	8.93	9.15	8.31
pH-temp.	°C	22.7	22.4	22.6	22.5	22.4	22.6	22.4	22.4	22.2	22.6	22.6	22.7	22.5
Conductivity	µS/cm	409	649	349	493	2270	1704	688	602	536	495	382	358	8880
Conduct.temp.	°C	22.2	22.2	22.2	22.2	22.2	22.2	22.2	20.9	22.2	22.2	22.2	22.2	20.9
CO <sub>2</sub>	mg/kg	28.5	15.3	14.3	22.0	10.8	10.7	43.5	17.5	30.3	16.8	84.7	67.6	7.45
H <sub>2</sub> S	mg/kg	1.07	0.84	0.13	0.07	0.78	0.59	0.19	0.12	3.00	0.50	0.01	0.034	0.061
SiO <sub>2</sub>	mg/kg	136.4	118.0	89.2	94.7	130.0	117.6	140.4	84.5	235.2	115.9	92.6	104.74	69.7
Na	mg/kg	77.9	110.4	67.0	93.3	360.0	278.8	123.8	109.6	106.4	87.2	70.6	76.39	678.14
K	mg/kg	2.16	2.49	0.68	1.78	16.06	11.40	3.70	2.66	5.49	2.13	1.07	1.16	13.79
Ca	mg/kg	2.90	13.10	2.70	3.08	49.30	41.13	4.43	6.74	1.90	6.60	2.90	3.41	54.84
Mg	mg/kg	<0.01	0.0200	<0.01	<0.01	<0.01	<0.01	0.0100	<0.01	<0.01	<0.01	<0.01	0.02	0.46
Fe	mg/kg	0.03	0.025	0.007	0.011	0.087	0.037	0.04	0.009	0.021	0.013	0.025	0.013	0.036
Al	mg/kg	0.139	0.034	0.127	0.210	0.061	0.076	0.158	0.063	0.490	0.055	0.024	0.017	<0.01
Li	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-
Cl	mg/kg	34.5	112.4	26.5	48.5	614.8	417.1	115.2	117.6	57.4	72.0	28.3	25.69	2428.22
SO <sub>4</sub>	mg/kg	56.1	74.8	23.2	69.8	112.8	128.4	54.8	45.7	63.5	57.3	34.1	31.8	337.21
F	mg/kg	2.72	2.18	2.40	1.02	0.55	0.57	0.97	0.65	2.80	1.92	0.77	0.67	1.36
Dissolved O <sub>2</sub>	µg/kg	0	0	0	0	0	0	0	0	0	0	0	0	0

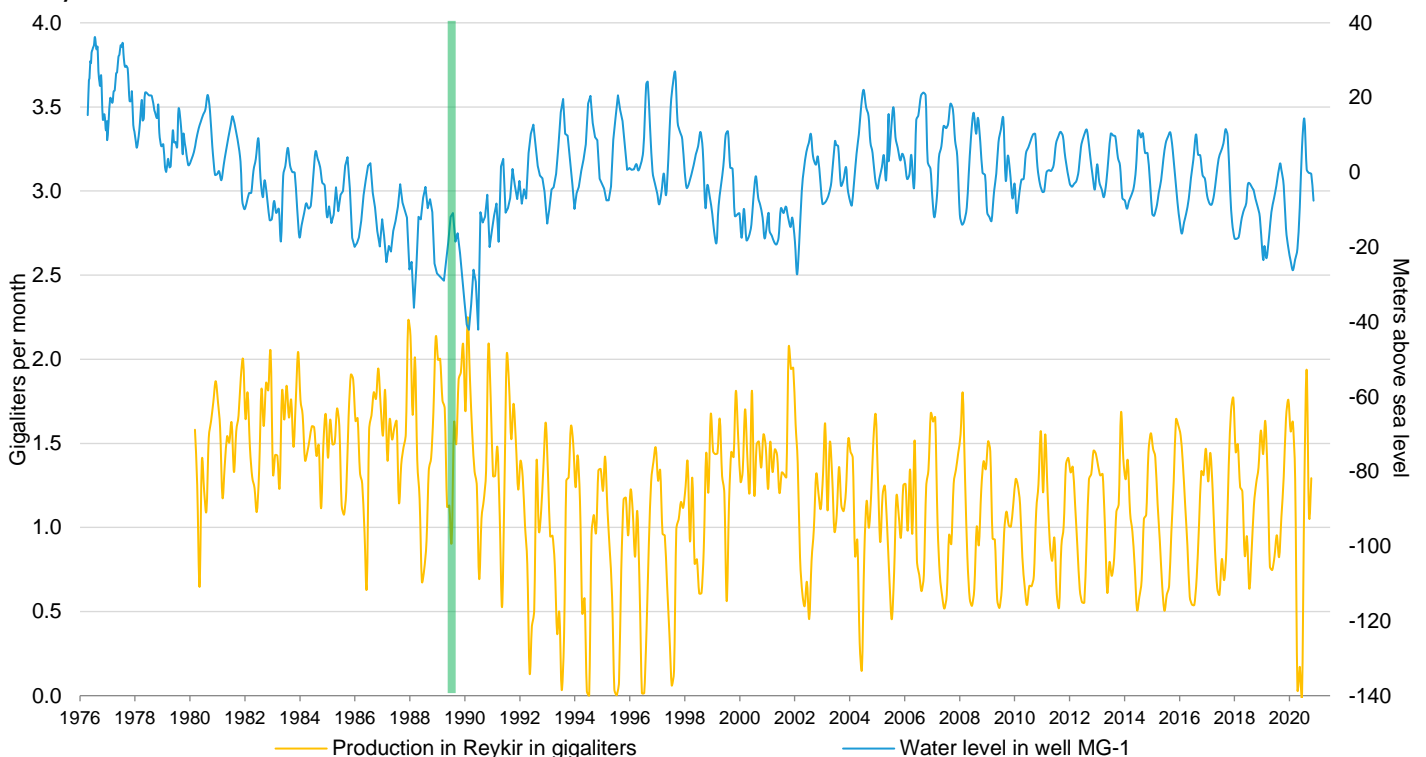
# Water production and water levels in wells in the low-temperature fields of Veitur Utilities in the capital area

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

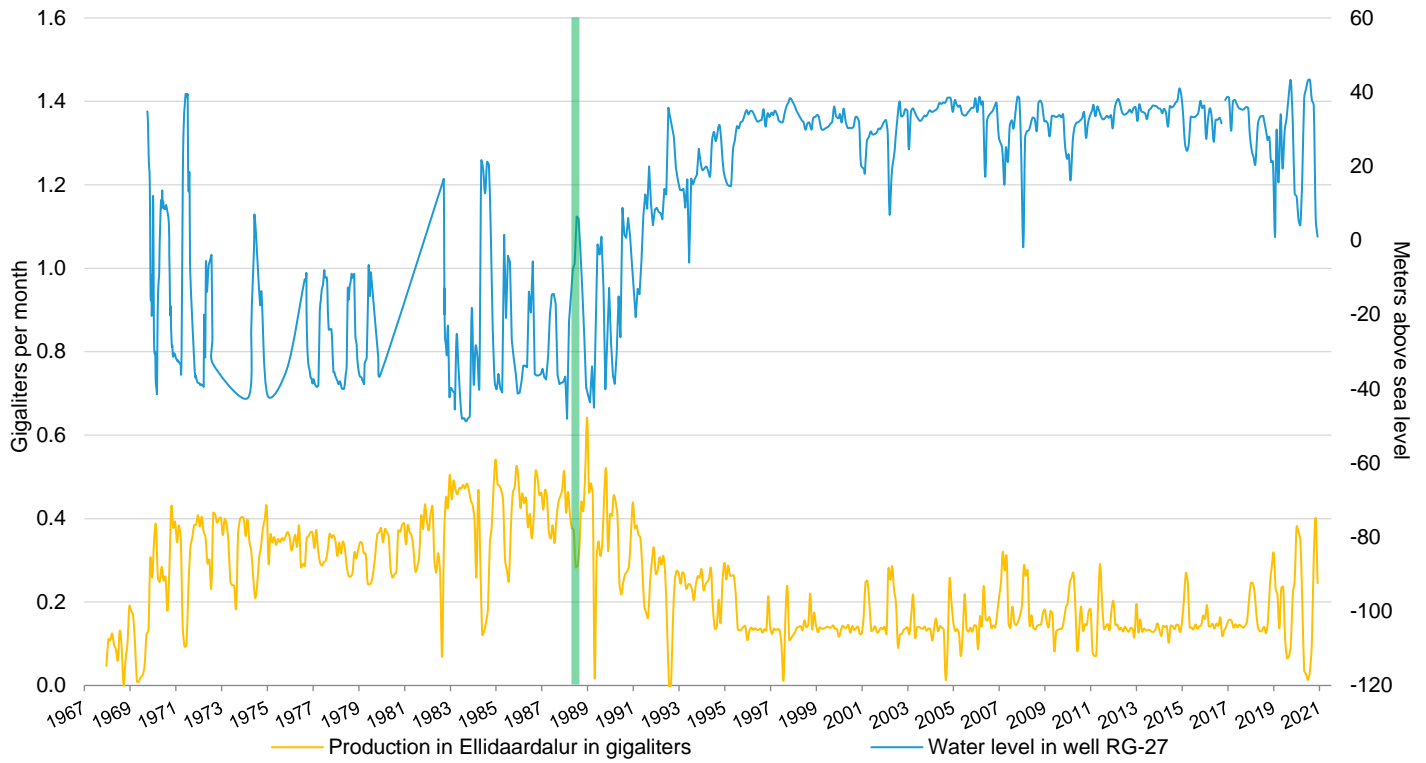


## Reykir





## Ellidaar



## Laugarnes

