

CASCADE NATURAL GAS CORPORATION
2018 LOW INCOME Program Participant Cost Effectiveness Estimates
TOTAL IN FIRST YEAR by MEASURE

MEASURE	PARTICIPANTS	TOTAL ANNUAL THERM SAVINGS	MEASURE INSTALLED COST	NON-ENERGY BENEFITS (10% of cost)	MEASURE LIFE	DISCOUNTED THERM SAVINGS	PROGRAM DELIVERY & ADMIN	PROGRAM REBATE	UTILITY COST	UC W/DELIVERY & ADMIN	BENEFIT COST RATIO	TOTAL RESOURCE COST	TRC W/DELIVERY & ADMIN	BENEFIT COST RATIO
Attic/Ceiling Insulation	23	2044.51	\$ 56,168.06	\$ 5,617	45	39,589	\$ 9,424.10	\$ 56,168.06	\$ 1,419	\$ 1,657	1.32	\$ 1,277	\$ 1,515	1.200
Floor Insulation	13	707.04	\$ 45,859.24	\$ 4,586	45	13,691	\$ 3,259.08	\$ 45,859.24	\$ 3,350	\$ 3,588	0.61	\$ 3,015	\$ 3,253	0.559
Wall Insulation	9	743.99	\$ 32,813.89	\$ 3,281	45	14,406	\$ 3,429.40	\$ 32,813.89	\$ 2,278	\$ 2,516	0.87	\$ 2,050	\$ 2,288	0.795
Duct Sealing	9	693.00	\$ 5,985.58	\$ 599	13	6,739	\$ 3,194.36	\$ 5,985.58	\$ 0.888	\$ 1.362	0.62	\$ 0.799	\$ 1.273	0.599
Air Infiltration Reduction	21	273.00	\$ 26,624.47	\$ 2,662	13	2,655	\$ 1,258.38	\$ 26,624.47	\$ 10.029	\$ 10.503	0.08	\$ 9.026	\$ 9.500	0.080
Water Heater Insulation	3	19.20	\$ 817.24	\$ 82	18	235	\$ 88.50	\$ 817.24	\$ 3.481	\$ 3.858	0.26	\$ 3.133	\$ 3.510	0.257
Tankless Water Heater	2	108.00	\$ 10,398.80	\$ 1,040	18	1,321	\$ 497.82	\$ 10,398.80	\$ 7.874	\$ 8.251	0.12	\$ 7.087	\$ 7.464	0.121
Furnace Tune Up	2	42.00	\$ 889.90	\$ 89	10	333	\$ 193.60	\$ 889.90	\$ 2.669	\$ 3.249	0.24	\$ 2.402	\$ 2.982	0.233
Duct Insulation	5	105.81	\$ 8,709.44	\$ 871	45	2,049	\$ 487.73	\$ 8,709.44	\$ 4.251	\$ 4.489	0.49	\$ 3.826	\$ 4.064	0.448
High Efficiency Furnace Installation	4	444.00	\$ 18,194.38	\$ 1,819	18	5,429	\$ 2,046.60	\$ 18,194.38	\$ 3.351	\$ 3.728	0.27	\$ 3,016	\$ 3,393	0.266
High Efficiency Space Heater	0	0.00	\$ -	\$ -	20	0	\$ -	\$ -	\$ -			\$ -		
Showerhead	0	0.00	\$ -	\$ -	10	0	\$ -	\$ -	\$ -			\$ -		
Aerator	0	0.00	\$ -	\$ -	10	0	\$ -	\$ -	\$ -			\$ -		
TOTAL PROGRAM	91	5,180.55	\$ 247,256.84	\$ 20,646	41.54	86,447	\$ 64,675	\$ 234,667.46	\$ 2,715	\$ 3,463	0.648	\$ 2,621	\$ 3,370	0.555

IRP discount rate 4.43%
Inflation rate 2.00%
EE discount rate 4.43%

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**CASCADE NATURAL GAS CORPORATION
2016 INTEGRATED RESOURCE PLAN
BASECASE - MEDIUM FORECAST - AVERAGE WEATHER
45 YEAR RESOURCE SUMMARY COSTS - MELDED COST PER THERM**

	YEAR	IRP ANNUAL PORTFOLIO COST PER THERM (PV)*	NOMINAL COST PER THERM	PV OF RESOURCE PORTFOLIO COST/THERM	NON ENERGY BENEFIT	PORTFOLIO COSTS WITH CONSERVATION CREDIT	COST- EFFECTIVENESS LIMIT
2017	1	\$0.50	\$0.53	\$0.53	5%	\$0.55	\$0.58
2018	2	\$0.48	\$0.53	\$1.05	5%	\$1.10	\$0.59
2019	3	\$0.46	\$0.52	\$1.58	5%	\$1.65	\$0.60
2020	4	\$0.44	\$0.52	\$2.10	5%	\$2.20	\$0.61
2021	5	\$0.43	\$0.54	\$2.63	7.5%	\$2.83	\$0.64
2022	6	\$0.43	\$0.56	\$3.20	7.5%	\$3.43	\$0.66
2023	7	\$0.41	\$0.56	\$3.75	7.5%	\$4.03	\$0.68
2024	8	\$0.41	\$0.58	\$4.33	7.5%	\$4.66	\$0.70
2025	9	\$0.40	\$0.59	\$4.92	7.5%	\$5.29	\$0.72
2026	10	\$0.39	\$0.60	\$5.52	10.0%	\$6.07	\$0.75
2027	11	\$0.38	\$0.61	\$6.13	10%	\$6.75	\$0.78
2028	12	\$0.38	\$0.64	\$6.77	10%	\$7.45	\$0.80
2029	13	\$0.37	\$0.65	\$7.42	10%	\$8.16	\$0.83
2030	14	\$0.37	\$0.68	\$8.10	10%	\$8.91	\$0.85
2031	15	\$0.37	\$0.71	\$8.81	12.5%	\$9.91	\$0.90
2032	16	\$0.36	\$0.71	\$9.52	12.5%	\$10.71	\$0.93
2033	17	\$0.36	\$0.75	\$10.27	12.5%	\$11.55	\$0.96
2034	18	\$0.35	\$0.76	\$11.02	12.5%	\$12.40	\$0.99
2035	19	\$0.34	\$0.77	\$11.79	12.5%	\$13.27	\$1.02
2036	20	\$0.33	\$0.79	\$12.59	12.5%	\$14.16	\$1.06
2037	21	\$0.32	\$0.80	\$13.39	15%	\$15.40	\$1.11
2038	22	\$0.31	\$0.81	\$14.20	15%	\$16.33	\$1.15
2039	23	\$0.30	\$0.82	\$15.01	15%	\$17.27	\$1.18
2040	24	\$0.29	\$0.83	\$15.84	15%	\$18.22	\$1.22
2041	25	\$0.28	\$0.83	\$16.67	15%	\$19.17	\$1.25
2042	26	\$0.27	\$0.84	\$17.52	17.5%	\$20.58	\$1.31
2043	27	\$0.26	\$0.85	\$18.37	17.5%	\$21.58	\$1.35
2044	28	\$0.26	\$0.86	\$19.23	17.5%	\$22.59	\$1.38
2045	29	\$0.25	\$0.87	\$20.09	17.5%	\$23.61	\$1.42
2046	30	\$0.24	\$0.88	\$20.97	17.5%	\$24.64	\$1.45
2047	31	\$0.23	\$0.89	\$21.85	20%	\$26.22	\$1.52
2048	32	\$0.22	\$0.89	\$22.75	20%	\$27.30	\$1.56
2049	33	\$0.22	\$0.90	\$23.65	20%	\$28.38	\$1.60
2050	34	\$0.21	\$0.91	\$24.56	20%	\$29.48	\$1.64
2051	35	\$0.20	\$0.92	\$25.48	20%	\$30.58	\$1.68
2052	36	\$0.20	\$0.93	\$26.41	20%	\$31.70	\$1.72
2053	37	\$0.19	\$0.94	\$27.35	20%	\$32.82	\$1.76
2054	38	\$0.18	\$0.95	\$28.30	20%	\$33.96	\$1.80
2055	39	\$0.18	\$0.96	\$29.26	20%	\$35.11	\$1.84
2056	40	\$0.17	\$0.97	\$30.23	20%	\$36.27	\$1.88
2057	41	\$0.17	\$0.98	\$31.21	20%	\$37.45	\$1.92
2058	42	\$0.16	\$0.99	\$32.19	20%	\$38.63	\$1.96
2059	43	\$0.15	\$1.00	\$33.19	20%	\$39.83	\$2.01
2060	44	\$0.15	\$1.01	\$34.20	20%	\$41.04	\$2.05
2061	45	\$0.14	\$1.02	\$35.22	20%	\$42.26	\$2.10

Cascade's Long Term Real Discount Rate:

IRP Discount Rate =	4.43%
Revised Discount Rate=	4.43%
Years 21-45 Escalation =	2.00%