

EXISTING CONDITIONS: WITHOUT SMALL WIND SYSTEM																											
Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	
Usage	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	6094	
Rate \$/kWh	0.130	0.136	0.143	0.149	0.156	0.164	0.171	0.179	0.188	0.197	0.206	0.215	0.226	0.236	0.247	0.259	0.271	0.284	0.297	0.311	0.326	0.341	0.357	0.374	0.391	0.410	
Inflation rate	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	0.047	
Cost \$	792	829	868	909	952	997	1044	1093	1144	1198	1254	1313	1375	1439	1507	1578	1652	1730	1811	1896	1985	2078	2176	2278	2385	2498	
ALTERNATIVE CONDITONS: WITH SMALL WIND SYSTEM																											
Aging rate		0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Wi. Produced	6286	6280	6273	6267	6261	6255	6248	6242.1	6236	6230	6223.4	6217	6211	6205	6199	6192.4	6186	6180	6174	6168	6161	6155	6149.2	6143	6137	6131	
Sold, kWh	192	186	179	173	167	161	154	148	142	136	129	123	117	111	105	98	92	86	80	74	67	61	55	49	43	37	
Rate \$/kWh	0.130	0.136	0.143	0.149	0.156	0.164	0.171	0.179	0.188	0.197	0.206	0.215	0.226	0.236	0.247	0.259	0.271	0.284	0.297	0.311	0.326	0.341	0.357	0.374	0.391	0.410	
Gain \$	25	25	26	26	26	26	26	27	27	27	27	27	26	26	26	25	25	24	24	23	22	21	20	18	17	15	
O & M rate	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	
Inflation rate	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	
O & M cost \$	203	210	217	225	232	241	249	258	267	276	286	296	306	317	328	339	351	363	376	389	403	417	432	447	462	479	
FINANCING: NO INCENTIVES; 100% OF INSTALLED COST IS BORROWED AT 6%/YR, INTEREST DEDUCTABLE																											
Principal	40500	39761	38978	38147	37267	36334	35345	34297	33186	32008	30759	29436	28033	26546	24970	23299	21528	19651	17661	15551	13315	10945	8433	5770	2947	0	
Int. Paym	2430	2386	2339	2289	2236	2180	2121	2058	1991	1920	1846	1766	1682	1593	1498	1398	1292	1179	1060	933	799	657	506	346	177		
Princ Paym	739	783	830	880	933	989	1048	1111	1178	1249	1323	1403	1487	1576	1671	1771	1877	1990	2109	2236	2370	2512	2663	2823	2947		
Total Paym	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	3169	
Tax Saving	851	835	819	801	783	763	742	720	697	672	646	618	589	557	524	489	452	413	371	327	280	230	177	121	62		
FINANCING: 50% OF INSTALLED COST IS A TAXABLE GRANT, TAX = 0.35* \$40,500 PLUS \$20,250 IS BORROWED AT 6%/YR, INTEREST DEDUCTABLE																											
Principal	27338	26839	26310	25750	25156	24526	23859	23151	22401	21606	20764	19870	18924	17920	16856	15729	14533	13266	11923	10500	8991	7391	5696	3898	1993	0	
Int. Paym	1640	1610	1579	1545	1509	1472	1432	1389	1344	1296	1246	1192	1135	1075	1011	944	872	796	715	630	539	443	342	234	120		
Princ Paym	499	529	560	594	630	667	707	750	795	843	893	947	1004	1064	1128	1195	1267	1343	1424	1509	1600	1696	1797	1905	1993		
Total Paym	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	2139	
Tax Saving	574	564	553	541	528	515	501	486	470	454	436	417	397	376	354	330	305	279	250	220	189	155	120	82	42		
FINANCING: CURRENT INCENTIVES																											
Principal	26600	26115	25601	25056	24478	23866	23217	22529	21800	21027	20207	19339	18418	17442	16408	15311	14149	12917	11611	10226	8759	7204	5555	3807	1954	0	
Int. Paym	1596	1567	1536	1503	1469	1432	1393	1352	1308	1262	1212	1160	1105	1047	984	919	849	775	697	614	526	432	333	228	117		
Princ Paym	485	514	545	578	612	649	688	729	773	819	869	921	976	1034	1097	1162	1232	1306	1384	1467	1555	1649	1748	1853	1954		
Total Paym	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	2081	
Tax Saving	559	548	538	526	514	501	488	473	458	442	424	406	387	366	345	322	297	271	244	215	184	151	117	80	41		
EXISTING CONDITIONS: WITHOUT SMALL WIND SYSTEM																											
Purchased electricity cost over 25 years																											
Purchased electricity over 25 years																											
Levelized electricity over 25 years																											
Note:	Past loan guarantees, low interest rate financing, grants, federal and state tax credits, tax effects of deductions from taxable income and not accounting for environmental, health, military (to protect resources), nuclear plant decommissioning and nuclear waste storage costs, have artificially reduced levelized costs of fossil and nuclear power. Proposed carbon and/or CO2 taxes, coal gasification and CO2 sequestration, etc., will increase future levelized costs.																										
ALTERNATIVE CONDITONS: WITH SMALL WIND SYSTEM																											
Wind electricity produced over 25 years																											
O & M costs over 25 years																											
Financing cost, interest and principal over 25 years																											
Gain from tax savings over 25 years																											
Total cost over 25 years																											
Purchased electricity cost over 25 years																											
Total cost of ALTERNATIVE CONDITIONS																											
Excess cost of ALTERNATIVE CONDITIONS																											
Levelized cost of small wind power over 25 years																											
GENERAL NOTES:																											
Electricity use is assumed at 6,094 kWh/yr																											
Electricity rates are assumed to increase at 4.7% per year.																											
Residential small wind system: Charlotte, Vermont, capacity 10 kW, installed cost \$40,500, or \$4,050/kW																											
Capacity factor = (6,094 + 192) kWh/yr/(10 kW x 8,760 hr/yr) = 0.0712																											
Small wind system life is assumed at 25 years, after which it may need to be upgraded/refurbished/replaced.																											
Operation and maintenance, O & M, costs are assumed at 0.5% of installed cost, inflating at 3.5% per year. O & M percentage may increase as the system ages.																											
Small wind system aging is assumed at 0.1% per year.																											
O & M outages of small wind systems may be greater than assumed and their useful service life may be less than 25 years.																											
Maintenance of a mast-mounted wind turbine requires lowering the wind turbine to grade, repairing and remounting; at least a one day operation with at least 2 people.																											
Recycling and disposal costs were not included in this analysis.																											
Wind system output is affected by icing, snow, too high winds, too low winds, wind variability, strength and duration																											
Small wind turbines, usually not at ideal sites, have low capacity factors. Big wind turbines on ridge lines in Vermont may have capacity factors of about 0.30																											
Small wind maximum rotor efficiency (wind power out divided by wind power in) is about 22%, big wind maximum is about 35% - 40%																											
Interest rate is assumed at 6%; loan amortized over 25 years; loan starts on Jan.1, 2009																											
Financing and other fees were not included in this analysis. Renewable energy systems are exempt from sales and property taxes in Vermont.																											