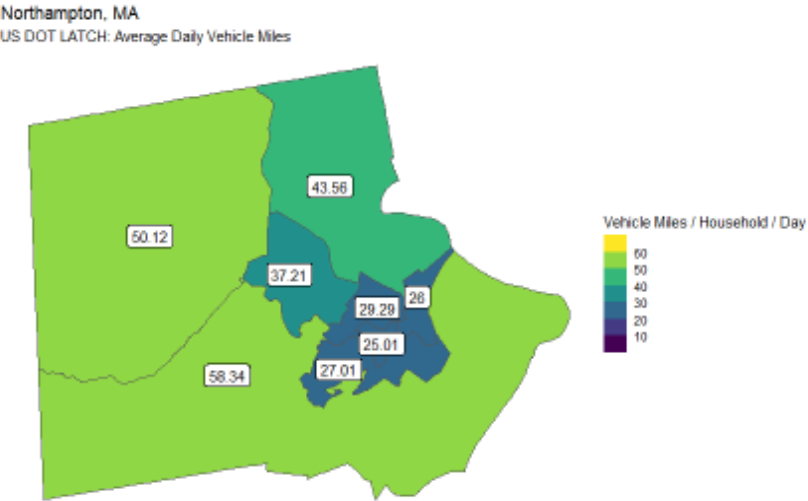


Values Highlighted in Green directly referenced in calculations

Household Vehicle Miles per Day

	Values to Average			
Inner Core	27.01	25.01	29.29	26
Core Adjacent	37.21	43.56		
Outer Edge	50.12	58.34		

Transport	Urban Core	10	vehicle miles / household / day
	Core Adjacent	40.385	vehicle miles / household / day
	Outer Edge	54.23	vehicle miles / household / day



Vehicle Fuel Economy/Carbon Intensity

https://afdc.energy.gov/vehicles/electric_emissions_sources.html

			MTCO2e/mi																
Value			6	7	8	9	10	11	12	13	14	15	16	17	18	19			
Fossil	mi/gal	21.79	0.00040293712	0.000402	0.000402937	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402
Hybrid	mi/gal	39.78	0.00022071392	0.000220	0.000220713	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220
Battery Electric	mi/kwh	3.06	0.00006101031	0.00006	0.00006	0.00005	0.00004	0.00004	0.00003	0.00003	0.00002	0.00002	0.00002	0.00002	0.00001	0.00001	0.00001	0.00001	0.00001
Plug-In hybrid			0.00206539504	0.002065	0.002065395	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065
Plug-In hybrid	mi/gal	40.8	0.00464692482	0.004646	0.004646924	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646
Plug-In hybrid	mi/kwh	3.03	0.00006161437	0.00006	0.00006	0.00005	0.00004	0.00004	0.00003	0.00003	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Plug-In hybrid	E Mile Share	56.3																	

GRID Carbon Intensity

		2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Electricity Factor	lbs/MWH	574																
	mtCO2/kwh	0.00026043	0.000234075	0.000210	0.00018669156	0.000178	0.000170491	0.000147	0.000124	0.000107	0.000090	0.000077	0.000063	0.000059	0.000054	0.000050	0.000045	0.000045
Clean E Factor			-10%	-10%	-11%	-4%	-5%	-13%	-16%	-14%	-16%	-15%	-17%	-7%	-7%	-9%	-9%	0%
Cambium			246.06	221.155	196.25	187.735	179.22	155.15	131.08	113.105	95.13	80.98	66.83	62.22	57.61	52.7	47.79	47.985

<https://scenariovi>

Tree Carbon and Sequestration

Values Sampled from CUTR Calculator v1.2
https://www.fs.usda.gov/ccrc/index.php/tool/cufr-tree-carbon-calculator-ctcc

		Age	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Quercus Rubra	CO2 Sequestration	(kg/tree)	0.92689174	1.871179604	3.002945	4.29048988	5.713929	7.259284856	8.916038	10.67591	12.53217	14.47919	16.51220	18.62710	20.82026	23.08850	25.42899	27.83916	30.31669
	Total CO2 Stored	(kg/tree)	1.16304515	3.034224761	6.037170	10.32766042	16.04158	23.30087468	32.21691	42.89282	55.42499	69.90418	86.41639	105.0434	125.8637	148.9522	174.3812	202.2204	232.5371
	Above ground biomass	(kg/tree)	0.49437341	1.289752214	2.566208	4.3899592	6.818768	9.904458993	13.69438	18.23237	23.55940	29.71403	36.73285	44.65064	53.50067	63.31486	74.12391	85.95745	98.84411

DBH	CO2 Sequestration (kg/tree)	Total CO2 Stored (kg/tree)	Above ground biomass (kg/tree)
DBH - 5	19	110	47
DBH - 10	54	602	256
DBH - 15	98	1631	693
DBH - 20	150	3307	1406
DBH - 25	209	5722	2432
DBH - 30	273	8955	3806
DBH - 35	342	13079	5559
DBH - 40	416	18158	7718

Building Energy Intensity

Single-Family Detached: Electric Units				
			Electric EUI (kWh/Sqft)	Electric EUI (MMBtu /Sqft)
	Baseline	Baseline	14.15	0.0483
	Enc-2	Enhanced e	10.42	0.0356
	HP-2	Heat pump:	7.31	0.0249
	EL-2	Whole-horr	6.65	0.0227
	EL-4	Whole-horr	5.55	0.0189

Multi-Family: Electric Units				
			Electric EUI (kWh/Sq ft)	Electric EUI (MMBtu /Sqft)
	Baseline	Baseline	9.58	0.0327
	Enc-2	Enhance	8.00	0.0273
	HP-2	Heat pur	5.93	0.0202
	EL-2	Whole-h	5.48	0.0187
	EL-4	Whole-h	5.02	0.0171

Single-Family Detached: Gas Units						
			Gas EUI (kWh/Sqft)	Gas EUI (MMBtu /Sqft)	Gas EUI (therm/Sqft)	Electric EUI (MMBtu/Sq ft)
	Baseline	Baseline	17.18	0.0586	0.5862	3.61
	Enc-2	Enhanced e	11.59	0.0396	0.3956	3.37

Multi-Family: Gas Units						
			Gas EUI (kWh/Sq ft)	Gas EUI (MMBtu /Sqft)	Gas EUI (therm/ Sqft)	Electric EUI (MMBtu /Sqft)
	Baseline	Baseline	11.48	0.0392	0.3916	4.82
	Enc-2	Enhance	8.84	0.0302	0.3016	4.72

HP-2	Heat pump:	2.46	0.0084	0.0838	6.87	0.0234
EL-2	Whole-horr	0.04	0.0001	0.0015	7.07	0.0241
EL-4	Whole-horr	0.04	0.0001	0.0015	5.76	0.0197

HP-2	Heat pur	3.78	0.0129	0.1289	6.08	0.0207
EL-2	Whole-h	0.07	0.0002	0.0024	6.44	0.0220
EL-4	Whole-h	0.07	0.0002	0.0024	5.77	0.0197

Single-Family EUI Splits				
	Electricity in Electric Units	Gas Use in Gas Units	Electricity in Gas Units	
Baseline	40.50%	49.17%	10.33%	

Multi-Family EUI Splits			
	Electricity in Electric Units	Gas Use in Gas Units	Electricity in Gas Units
Baseline	37.01%	44.36%	18.63%

Specialized Code		Fuel: ALL Electric			Fuel: Gas/Mixed			
2021 IECC	Site EUI (kBtu/Sqft)	Site EUI (MMBtu/S qft)	Electric EUI (MMBtu/S qft)	Electric EUI (kWh/S qft)	Electric EUI (MMBtu/Sqft)	Electric EUI (kWh/S qft)	Gas EUI (MMBtu/S qft)	Gas EUI (therm/ Sqft)
Residential	41.50	0.0415	0.0168	4.925229	0.0043	1.256364	0.0204	0.2041
https://www.energycodes.gov/sites/default/files/2021-07/2021_IECC_Final_Determination_AnalysisTSD.pdf								

Specialized Code		Fuel: All -Electric			Fuel: Gas/Mixed			
2021 IECC	Site EUI (kBtu/Sq ft)	Site EUI (MMBtu/Sqft)	Electric EUI (MMBtu/Sqft)	Electric EUI (kwh/S qft)	Electric EUI (MMBtu/Sqft)	Electric EUI (kWh/S qft)	Gas EUI (MMBtu/Sqft)	Gas EUI (therm/ Sqft)
Residenti	41.50	0.0415	0.0154	12.1624	0.0077	2.265992	0.0184	0.184083

		Energy Inensity Factors		MBODIED CARBON FACTOR		CONTROLS FOR EMBODIED CARBON	
						Property A	Property B
Electricity		kwh/sqft	High Carbon	Ma	Low Carb	5	4
	None	0	0	0			
	Single Family Existing	3.61	637	139			
	Multi Family Existing	4.82	541	173			
	Single Family New	1.256364	637	139			
	Multi Family New	2.265992	541	173			
	Single Family Specialized C	4.925229	637	139			
	Multi Familiy Specialized C	12.1624	541	173			
		therms/sqft					
	None	0					
Building Energy	Single Family Existing	0.5862					
	Multi Family Existing	0.3916					
	Single Family New	0.2041					
	Multi Family New	0.184083					
	Single Family Specialized C	0					
	Multi Familiy Specialized C	0					
	Gas	Fossil Gas Emissions Factor	0.005306	MTCO2/therm			

Embodied Carbon Detail - NOT USED IN FINAL MODEL

Home Materials from EPA Single Family LCA Study

Home Size	2170 square feet						
		Unit/sqft	144 cu in	m3 material / sqft	kg CO2/m3		kg CO2 / Sqft
https://www.inchcalculator.com/ Lumber	13837 board feet	6.376497696	918.2156	0.01504689198	63.12 CLF - F1.3		0.949759
Sheathing	13118 square feet	0.503763440	72.54193	0.00118875195	242.58 CLF -F5.3		0.288367
concrete	19 tons	8.895852535	1440	0.00617767537	264 CLF - B2.3		1.630906
exterior siding	3206 square feet						
Roofing	3101 square feet						
Insultation	3061 square feet						
Wall Material	6050 square feet						
Ceiling Material	2335 square feet						
Ducting	226 linear feet						
Windows	19 Units						
Exterior Doors	4 Units						
Flooring	2269 square feet						
Interior Doors	12 Units						
Closet Doors	6 Units						
Garage Doors	2 Units						
Fireplace	1						



20	21	22	23	24	25	26	27	28	29	30	31	32
0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402	0.000402
0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220	0.000220
0.00001	0.00001	0.00001	0.00002	0.00002	0.00001	0.00001	0.00001	0.00001	0.00000	0.00000	0.00000	0.00000
0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065	0.002065
0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646	0.004646
0.00002	0.00001	0.00001	0.00002	0.00002	0.00001	0.00001	0.00001	0.00001	0.00000	0.00000	0.00000	0.00000



2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
0.000045	0.000045	0.000044	0.000046	0.000047	0.000042	0.000037	0.000032	0.000028	0.000014	0.000001	0.000000	0.000000
0%	-1%	-1%	3%	3%	-11%	-12%	-12%	-14%	-48%	-92%	-20%	-26%
48.18	47.5	46.82	48.44	50.06	44.675	39.29	34.55	29.81	15.52	1.23	0.98	0.73



19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
32.85948	35.46561	38.13328	40.86086	43.64683	46.48976	49.38833	52.34131	55.34753	58.40588	61.51534	64.67493	67.88371	71.14082	74.44541	77.79669	81.19389	84.63630	88.12321	91.65397	95.22793	98.84449	102.5030	106.2030
265.3966	300.8622	338.9955	379.8563	423.5031	469.9929	519.3813	571.7226	627.0701	685.4760	746.9913	811.6663	879.5500	950.6908	1025.136	1102.932	1184.126	1268.763	1356.886	1448.540	1543.768	1642.612	1745.115	1851.318
112.8116	127.8869	144.0961	161.4648	180.0177	199.7790	220.7724	243.0210	266.5475	291.3740	317.5222	345.0134	373.8686	404.1083	435.7527	468.8216	503.3345	539.3107	576.7691	615.7283	656.2066	698.2223	741.7931	786.9366



43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65
109.9439	113.7252	117.5463	121.4069	125.3063	129.2442	133.2201	137.2336	141.2842	145.3717	149.4955	153.6553	157.8508	162.0815	166.3472	170.6475	174.9820	179.3506	183.7527	188.1882	192.6568	197.1581	201.6919
1961.262	2074.988	2192.534	2313.941	2439.247	2568.492	2701.712	2838.945	2980.230	3125.601	3275.097	3428.752	3586.603	3748.685	3915.032	4085.679	4260.661	4440.012	4623.765	4811.953	5004.610	5201.768	5403.460
833.6703	882.0113	931.9765	983.5827	1036.846	1091.784	1148.411	1206.745	1266.800	1328.593	1392.139	1457.453	1524.550	1593.446	1664.155	1736.692	1811.071	1887.307	1965.415	2045.408	2127.300	2211.105	2296.838

	25	30	35	40
	208.7015	272.7089	341.8393	415.6756
	5721.781	8955.023	13078.76	18158.01
	2432.146	3806.494	5559.366	7718.393

