

1.6.3 Embodied Energy of Commercial Concrete Exterior Walls in the U.S.

	Embodied Energy (MMBtu/SF) (1)		CO2 Equivalent Emissions (lbs/SF)	
	U.S. North (2)	U.S. South (3)	U.S. North (2)	U.S. South (3)
8" Concrete Block (4)				
Brick Cladding	0.26	0.26	42.59	42.37
Stucco Cladding	0.25	0.25	40.17	39.95
Steel Cladding	0.41	0.41	67.77	67.57
2x4 Steel Stud Wall (16" OC)	0.24	0.24	39.46	39.24
6" Cast-In-Place Concrete (3)				
Brick Cladding	0.13	0.13	24.43	24.21
Stucco Cladding	0.11	0.11	22.00	21.78
Steel Cladding	0.28	0.27	49.60	49.41
2x4 Steel Stud Wall (16" OC)	0.11	0.11	21.30	21.08
8" Concrete Tilt-Up (4)				
Brick Cladding	0.14	0.14	28.26	28.04
Stucco Cladding	0.12	0.12	25.84	25.62
Steel Cladding	0.29	0.28	53.44	53.24
2x4 Steel Stud Wall (16" OC)	0.12	0.12	25.13	24.91
Insulated Concrete Forms (5)				
Brick Cladding	0.16	0.16	29.45	29.45
Stucco Cladding	0.14	0.14	27.03	27.03
Steel Cladding	0.30	0.30	54.63	54.63

Note(s): Assumptions: 60 year building lifetime. Low rise building. Values are general estimations for the U.S. All assemblies are insulated to IECC 2009 minimums for zones 3 and 6. 1) Embodied Energy: Energy use includes extraction, processing, transportation, construction, and disposal of each material. 2) Northern values represent ASHRAE climate zone 6. 3) Southern Values represent ASHRAE climate zone 3. 4) Includes continuous insulation, polyethylene membrane, gypsum board, and latex paint. 5) Includes gypsum board and latex paint.

Source(s): Athena Institute. Athena EcoCalculator for Assemblies v.3.5.2. 2010. Available at www.athenasmi.org/tools/ecoCalculator/index.html