

Greenhouse Gas Emission Reduction Summary

Energy ----- Average Annual Emissions ----- Life-Cycle
 Type Base Case Alternative Reduction Reduction
 Electricity (Units in kilograms of emissions) (10 year)

J. Paul Getty Museum

CO ₂	1,422.5	241.8	1,180.7	11,805.2
SO ₂	0.35	0.06	0.29	2.91
NO _x	0.58	0.10	0.49	4.85

North America

CO ₂	28,837,095	4,904,130	23,932,965	239,228,325
SO ₂	7,092	1,216	5,877	58,971
NO _x	11,753	2,027	9,930	98,285

Europe

CO ₂	21,345,000	3,630,000	17,715,000	177,075,000
SO ₂	5,250	900	4,350	43,650
NO _x	8,700	1,500	7,350	72,750

North America + Europe

CO ₂	50,182,095	8,534,130	41,647,965	416,303,325
SO ₂	12,342	2,116	10,227	102,621
NO _x	20,454	3,527	17,280	171,035

World

CO ₂	78,265,000	13,310,000	64,955,000	649,275,000
SO ₂	19,250	3,300	15,950	160,050
NO _x	31,900	5,500	26,950	266,750

Table 1. J. Paul Getty Museum emission reduction from replacing 34 60W PAR38 quartz-halogen flood lamps with 34 10.2 W white LED retrofit lamps. North American estimates are based upon 20,265 museum (AAM, Canadian Heritage); European estimates based upon 15,000 museums (Network of European Museums); Museums worldwide based on 55,000 (ICOM).

(Reference: J. Druzik & Naomi Miller, 2012)