

## § 436.17

worth factor for the period of the delay, from the present value of recurring costs over the study period or, if using computer software, indicate a delayed beneficial occupancy date.

(d) The present value of non-recurring cost under § 436.16(a) is the product of the non-recurring costs as multiplied by appropriate single present worth factors under § 436.14 for the respective years in which the costs are expected to be incurred, or as calculated by computer software provided or approved by DOE and used with the official discount rate and escalation rate assumptions under § 436.14.

[55 FR 48220, Nov. 20, 1990, as amended at 61 FR 32650, June 25, 1996]

### § 436.17 Establishing energy or water cost data.

(a) Each Federal agency shall establish energy costs in the base year by multiplying the total units of energy used in the base year by the price per unit of energy in the base year as determined in accordance with § 436.14(c).

(b) When energy costs begin to accrue in the base year, the present value of energy costs over the study period is the product of energy costs in the base year as established under § 436.17(a), multiplied by the appropriate modified uniform present worth factor adjusted for energy price escalation for the applicable region, sector, fuel type, and study period consistent with § 436.14, or as calculated by computer software provided or approved by DOE and used with the official discount rate and escalation rate assumptions under § 436.14. When energy costs begin to accrue at a later time, subtract the present value of energy costs over the delay, calculated using the adjusted, modified uniform present worth factor for the period of delay, from the present value of energy costs over the study period or, if using computer software, indicate a delayed beneficial occupancy date.

(c) Each Federal agency shall establish water costs in the base year by multiplying the total units of water used in the base year by the price per unit of water in the base year as determined in accordance with § 436.14(c).

(d) When water costs begin to accrue in the base year, the present value of

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water costs over the study period is the product of water costs in the base year as established under § 436.17(a), or as calculated by computer software provided or approved by DOE and used with the official discount rate and assumptions under § 436.14. When water costs begin to accrue at a later time, subtract the present value of water costs over the delay, calculated using the uniform present worth factor for the period of delay, from the present value of water costs over the study period or, if using computer software, indicate a delayed beneficial occupancy date.

[55 FR 48220, Nov. 20, 1990, as amended at 61 FR 32650, June 25, 1996]

### § 436.18 Measuring cost-effectiveness.

(a) In accordance with this section, each Federal agency shall measure cost-effectiveness by combining cost data established under §§ 436.16 and 436.17 in the appropriate mode of analysis as described in § 436.19 through § 436.22.

(b) Federal agencies performing LCC analysis on computers shall use either the Federal Buildings Life Cycle Costing (FBLCC) software provided by DOE or software consistent with this subpart.

(c) Replacement of a building energy or water system with an energy or water conservation measure by retrofit to an existing Federal building or by substitution in the design for a new Federal building shall be deemed cost-effective if—

(1) Life cycle costs, as described by § 436.19, are estimated to be lower; or

(2) Net savings, as described by § 436.20, are estimated to be positive; or

(3) The savings-to-investment ratio, as described by § 436.21, is estimated to be greater than one; or

(4) The adjusted internal rate of return, as described by § 436.22, is estimated to be greater than the discount rate as set by DOE.

(d) As a rough measure, each Federal agency may determine estimated simple payback time under § 436.23, which indicates whether a retrofit is likely to be cost effective under one of the four calculation methods referenced in § 436.18(c). An energy or water conservation measure alternative is likely