

plumbing costs.\* Assuming that the entire construction cost saving of \$150 plus 15% builder's markup is passed on to consumers, the median sales price of single-family homes in California would drop by 0.2%.

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For multiple-family dwelling units greater than two stories in height, the proposed code change would reduce plumbing construction costs by a total (materials and labor) of \$425 per unit. This saving derives primarily from the use of PB in place of copper for inside water supply and the use of ABS in place of no-hub cast iron for inside DWV systems. This estimate is somewhat high because to achieve the required 1-hour fire rating in buildings higher than two stories with plastic pipe would require some additional protection against horizontal fire spread, such as installing metal flanges around the plastic pipe where it penetrates the fire wall. Assuming a 15% markup for builder's overhead and profit and a 20-year life for the plumbing system, the \$490 cost saving if passed on in its entirety to the renter, would lower the monthly rent on a unit by less than \$3.

In addition to the construction or capital cost of a plumbing system reflected in the sales price or rent of a dwelling unit, there are annual maintenance costs and replacement costs that will be incurred by the homeowner over the life of the plumbing system. Metal plumbing systems are subject to corrosion, which leads to clogs, leaks, and ultimately replacement of the system. The present value of expenditures for repairs, corrosion treatment, and replacement of a metal plumbing system in a single-family dwelling over the last 10 years of the 30-year service life of the system has been estimated at about \$700 (Journal AWWA, 1983). Comparable maintenance data are not available for plastic plumbing systems.

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\* Materials costs for various plastics and metals are from Plumbing Suppliers Survey (1983); comparative labor hours are derived from NAHB (1981), Service Plumbing (1979), and General Construction Estimating Standards (1976-77); average hourly wage rate (including fringe benefits) for plumbers in California is estimated at \$27.00 (Adams, 1983).

## F. Fiscal Impacts

The potential fiscal effects of expanded use of plastic plumbing pipe involve:

- . Changes in the cost of housing
- . Changes in the cost of providing public services
- . Changes in employment.

Each of these is discussed in this section.

### 1. Effects on Cost of Housing

For a typical new single-family dwelling unit built under the current code, plumbing costs run about \$600 for materials and \$500 for labor. The materials cost calculations are based on a copper and PVC water supply system and ABS DWV system (see Tables II-3 and II-4). Labor costs are derived from NAHB (1981), General Construction Estimating Standards (1976-77), and Service Plumbing (1979). This total plumbing cost of \$1,100--marked up 15% to cover builder's overhead and profit--represents about 1% of the 1983 median sales price of \$115,400 for existing single-family homes in California (California Association of Realtors, 1983).

The materials substitutions that are likely to occur in response to the proposed changes to the code allowing expanded use of plastic plumbing materials would reduce per-unit materials costs by about \$100 and labor costs by about \$50. These calculations are based on the use of PB in place of copper for water supply inside the unit. Any other substitutions of newly permitted plastics for metals or other plastics would increase the