

# **Financial Impact of Corrosion on the Economy**

by  
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# Financial Impact of Corrosion on the Economy of the United States

by

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Corrosion is a subject about which people are not particularly happy or like to think about ... and they are even less comfortable with the financial impact on their personal lives. For example, many face "sticker shock" when considering purchase of a new automobile. This has touched almost all of our lives recently. One of the most common reason for replacing an existing car is because of corrosion ... in fact, this form of automobile deterioration is often called "cancer".

In 1972, the National Association of Corrosion Engineers (now known as NACE International) attempted to gain publicity for the cost of corrosion in the United States. To accomplish this, they performed a survey to more accurately define all the variables and the cost of each. Quite frankly, one of their goals was to increase interest in NACE activities and their membership roles. After completing this study, they announced to the world that the annual cost of corrosion in the United States was about **\$10 billion**.

Unfortunately, nobody believed the NACE figures. The number was simply too large and most people suspected that the number was inflated to serve NACE's own needs.

Because of this reaction, NACE decided to hire an independent, expert organization to conduct a more intensive study of the corrosion costs in the U.S. They selected Battelle Memorial Research Institute of Columbus, Ohio. Upon completion of Battelle's detailed study, they announced to

NACE that the 1972 cost estimates were indeed wrong. Battelle's study showed that the cost was closer to \$70 billion per year.

We are all too painfully aware that a few billion dollars is almost pocket change to the Federal Government. But, when Congress learned of the much publicized Battelle cost estimate, even they became concerned. In order to verify the Battelle figures, the U.S. Department of Commerce performed a similar corrosion cost study. The results of their analysis, published in 1982, announced that cost was a "bit higher" than the Battelle cost estimate ... they placed it at **\$126.3 billion** and, of course, this was only for the United States. It should be understood that the U.S. Department of Commerce figures were in 1982 dollars. Inflation alone over the next six years increases this annual cost to over **\$170 billion** per year (1988).

But even that figure is incorrect. In 1982, the U.S. Department of Congress study did not include the cost of corrosion associated with the deterioration of our nations highways, bridges, water and wastewater systems, and leaking underground storage tanks. The principle cause of the accelerating deterioration and failure of these structures is corrosion.

In late 1982 - early 1983, the Federal Highway Administration (FHWA) indicated that they would have to spend **\$100 billion** over the next 10 years to repair bridge decks which have deteriorated by the process of

corrosion. Worse yet, they estimated another **\$150 billion** over a similar time period to repair the piers, beams, and columns suffering from the same problem. In 1988, they increased these estimates to over \$60 billion per year through the 1990's. And these enormous amounts were not in any of the above studies.

Many newspaper articles have recently appeared with respect to deterioration of our nation's water and sewer piping. Of particular emphasis is the older piping in our major cities. Several major utilities and the American Water Works Association (AWWA) have estimated that water and sewer rates will have to be tripled or quadrupled to finance the repair cost caused by this deterioration ... the major cause of which is directly attributable to corrosion. Finally, Congress did not bring to the public's attention the seriousness of leaking underground storage tanks until late 1984.

In 1987, Congress and the US EPA estimated that there were as many as 10 to 15 million UST's in the United States. Estimates made at that time indicated that 10% were leaking. Since the average clean up costs for a single leaking UST site is **typically \$158,000**, it is reasonable to estimate that clean up costs, due to leaking tanks, could be as much as **\$150 billion** in 1988 alone. When you add all of these estimates together, there is no question that the total cost of corrosion in the United States by 1990 exceeded \$300 billion per year.

**Even with the relatively low rate of inflation in the last decade, this cost is undoubtedly in excess of \$600 Billion in the year 2001.** That represents an amount equal to 4% - 6% of the Gross National Product (GNP) of this country and is also greater than the net profit generated by all

U.S. business annually. To put it on more personal terms, it means for each citizen of the country, **corrosion costs is in excess of \$2000 per person per year.** For a typical **family of 4**, they **must generate \$8,000** per year income just to pay for corrosion

The above information clearly indicates that corrosion is this nation's greatest presently occurring financial disaster. Corrosion costs more than automobile accidents, fires, natural disasters including wind, floods, tornados as well as burglary and theft. In spite of the above, we tend to "live with corrosion", accepting it as an inevitable fact of life. This need not be the case, as today's technology is certainly capable of practically and reasonably controlling much of this corrosion while reducing these costs at least in half.