

THE ACADEMY OF ELECTRICAL CONTRACTING

Paper presented by

Charles P. Wilson, Fellow

Political and Sociological Aspects of the Energy Crisis  
Affecting the Electrical Contractor  
July, 1974

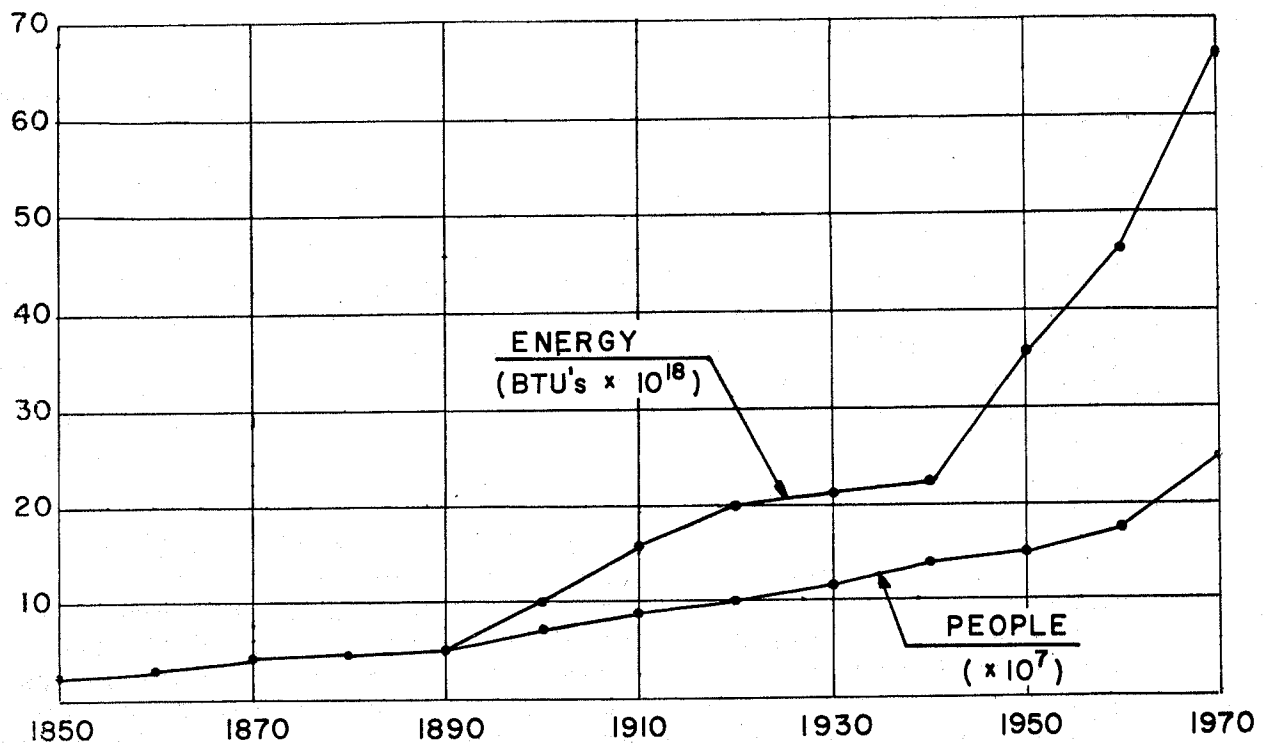
I am deeply honored to be allowed to present this paper to you, The Fellows of the Academy of Electrical Contracting. I make this presentation fully cognizant that each of you is as knowledgeable as I about energy crisis matters.

It has been my opportunity, however, in the last fifteen months, to study some aspects of the situation in some depth and to attempt to bring these aspects into the perspective of an electrical contractor.

And so, with your permission, let us quickly review the energy situation here in the United States.

We are, of course, geared to the consumption of large quantities of energy. With only 6% of the world's population, we consume about one third of the world's energy. This consumption has doubled in the last twenty years and is expected to double again by 1985.

Figure 1 shows the comparison of rate of growth of population and rate of growth of energy use. Obviously if this trend continues, almost unbelievable amounts of energy will be required in the not too distant future.



GROWTH OF AMERICAN ENERGY USE AND POPULATION

Thirdly, in the industrial market the use of energy is expected to increase 50% in the 1970 - 1985 period. This increase can be even greater but it is anticipated that concentrated effort will be made to improve efficiency in fuel utilization. The industrial area, however, will experience some shifting in energy sources. We have already seen some of this as industries have changed from coal to oil and gas to meet new environmental regulations.

Fourthly, electric utilities market for energy will experience the most rapid growth, around 7% per year.

With the exception of Russia, none of the industrialized nations of the world is self-supporting in energy. Our country was until recent years but we are now a net importer and a participant in the highly competitive world-wide energy market.

Energy is the ultimate raw material which permits the continued recycle of resources into most of man's requirements for food, clothing and shelter. Thus there becomes a definite relationship between income per person and per capita consumption of energy. The United States leads the world in both.

During the past thirty years energy consumption per dollar of GNP consistently declined annually. This was due principally to technology and increased efficiency of industrial equipment and processes. However, in the past four to five years the trend has reversed and the use of energy per capita has increased faster than GNP. One very cogent reason for this is the introduction of air quality standards.

Our national energy supply comes from essentially four sources -- oil, gas, coal and hydro-power which provide 98.4% of our energy needs. Oil provides 43%, gas 33%, coal 19.4% and hydro-power 3%.

Our nation has been richly endowed with large reserves of the base fuel material and we have taken them for granted in the expectation that adequate production would continue indefinitely at reasonable and competitive cost.

The NECA Special Report of June, 1973 had some interesting observations about how long it would be before we would run out of energy and other basic raw materials. This report quoted a study made by M.I.T. for the Club of Rome and the results are startling and ominous. World consumption of raw materials has grown at an ever increasing rate. Unchecked, it can be expected to continue.

It appears that abundant reserves remain to be developed but this increased capacity has been constrained by economical and ecological restrictions. Domestic production of oil has peaked and the United States currently imports about 25% of its oil requirements to provide for our consumption of fifteen million barrels a day. Based on current supply and demand, estimated consumption could reach twenty-four million barrels a day by 1985. This means that we would have over 60% of our oil needs supplied by foreign sources.

Congressman Satterfield of Virginia calculated that in order to have this many ships bringing oil to the United States it would require that the present world fleet of all types of ships be duplicated in tankers by the year 1985. This, of course, is a virtually impossible task.

Natural gas now provides one third of the United States' energy and has achieved importance for several reasons. It's clean; it's ecologically acceptable; it is utilized with ease; and has historically been a relatively inexpensive source of energy. This too is changing. In the mid-fifties gas producers were brought under regulation by the F.P.C. and prices have been kept at what the natural gas people tell us is an "artificially low level". Market prices and other factors have increased the demand for gas but well-head pricing policies have had an adverse effect on supply. The lack of sufficient incentive to expand exploration in order to meet increased demands has caused the drilling of new wells to decrease steadily each year.

Domestic production of natural gas will peak in the United States in 1975 but the gas industry is doing something about this by making liquefied natural gas plants and other such modern technological advances.

Of course we still have plenty of coal but there are several significant reasons why it won't help our energy crunch the next few years. One is air pollution laws. Another is high labor cost in the industry; another is high transportation costs and much higher production costs due to restrictions on strip mining and the Mann Safety Act. This is not to condemn any of these things. It is merely to face the facts.

Justin Moore, the president of VEPCO, recently made the statement that there are only two things wrong with coal -- one, you can't mine it, and two, you can't burn it.

When I came into the business twenty-five years ago we put in a whole lot of wall switches so that people could turn out the lights when they weren't using them. I have seen the trend grow away from wall switches with the feeling that it was cheaper to leave them on than to turn them off.

I think this attitude is going to see a significant shift. I think industrial controls which cut off unneeded idling power such as conveyors that run whether any material is on them or not are going to become very important.

But, perhaps the most significant thing will be a turn to the total energy concept which is not new, of course. This will mean that more industrial plants generate some if not all of their electrical requirements. This will mean a major market for the electrical contractor. Utilities in the past have violently opposed this sort of thing. They have made their rates attractive. They have, in my opinion, manipulated their rates to make such things unattractive to industrial users. These times are changing.

I do not for one minute advocate the elimination of large utility generating plants. I am convinced that they burn fossil fuels far more efficiently than the individual plant can burn its fuel. By doing so they are improving the environment and keeping the cost of energy down. But in the years to come the conservation of energy is going to be a far more important factor than the unit cost.

The cost of energy for large users will probably make the most significant increase in the next twenty years or so. The sliding scales of buying energy will be greatly changed.

What happened to cheap energy?

The flippant answer is -- what hasn't happened to cheap energy in the past ten years?

Because of (1) burgeoning growth rates created in part by low cost bulk users (2) environmental pressures (3) government regulation policies (4) under investment in some sectors (5) technical equipment pollution, the fuel supply in a number of areas around the country is quite thin and prices are going up.

When electric stations were small no one was concerned about the effect of heated water on the organisms in the water. There were many suitable sites for power plants. Now we are finding that we are having vast areas required for the erection of power plants.

Nuclear plants can't be put near populated zones. It may well be that we are beginning to see some sort of gigantic zoning where there is a large power plant and most of the large industrial units are clustered in an area around it. With the big areas being needed for cooling towers or lakes, we begin to see the rise of a term "agro-industrial" complex, or in the case of a nuclear plant a "nuplex". This sort of thing would allow improved energy utilization by both the electric and industrial combinations.

But, what of the social aspects of this energy and environmental question? Peter Passell and Leonard Ross, both young professors at Columbia, have written a new book "The Retreat from Riches". It is most interesting and the conclusions that they reach are not exactly what you would expect young liberal economic professors to reach.

They make a pretty solid case for economic growth. They say that it is the best way and may be the only way to cure America's environmental and sociological and economical ills.

Growth, according to Passell and Ross, needn't befoul the environment. Pollution, they say, comes not from growth but from the nation's odd system of incentives to industry. Since nobody is charged for using the environment, its value is ignored. The answer is not to stop aiming for growth, they say, but to start charging for pollution. If Con-Ed had been forced to pay for its abuse of the air, management would have learned how to clean up its own mess. If automobiles were taxed according to the content of their emissions, General Motors would have found it worthwhile to build sweet-smelling engines. Halting growth would do far less to scrub the environment than a simple policy of making business put its money where its exhaust is.

The Journal stated that incomes vastly outstripped the cost of things. What this adds up to is the greatest growth in average-man living standards in the history of mankind.

So, how is it that people so widely lament that they have trouble keeping up with the cost of living? The answer is that "living" covers a vastly wider world of consumption than it used to. There is no end to the things unknown a couple of generations ago that are now considered "necessities" by countless Americans: TV sets, dishwashers, clothing washers, garbage disposers, ten-speed bicycles, motor boats, freezers, closets full of sporting equipment, extensive vacation travel, summer homes, camping outfits, and so on.

Probably best symbolizing the abundance of physical things people feel they need for "living" today is the automobile. Here is a comparison between the growth in the number of people and the growth in the number of automobiles (passenger cars) on the country's streets and roads in the post war period:

1947-	30,718,841 cars	144,126,000 people
1953-	46,422,443 "	160,184,000 "
1959-	59,561,716 "	177,810,000 "
1965-	75,400,000 "	194,303,000 "
1971-	96,397,000 "	208,837,000 "

The record here adds up to people population up 45%; car population up 214%.

Nor is there as much evidence that the cost of living "pinch" is restraining people from buying even more cars. Detroit (despite the imports) rolled out a fantastic 1,708,000 new cars in last year's first quarter, nearly 20% more than a year earlier.

But vast spending on modern consumer "hard goods" does not tell the whole story. In the "soft" wares area, the American people now habitually spend billions of dollars on things that can hardly be classified as among the bare essentials of existence.

Women spend some \$3.5 billion a year in beauty shops. Sales of beer, wine and liquor are in the neighborhood of \$16 billion yearly - in the wholesale market. And eating and drinking out in bars and restaurants rings up sales of some \$35 billion yearly.

What should be our attitude towards this energy problem that is before us?

I think there are a number of things which we as citizens, especially as electrical contractors, should be alert to and should practice in our lives, both private and business.

1. -- We should conserve energy to the point of sacrifice. But let us keep our values straight. Giving up electrical tooth brushes and swizzle sticks is not going to do much to relieve the energy crisis.

We could dwell all day on ways to save energy such as attempting to travel less and take more people with us when we are driving our cars. All of you know them as well as I do.

2. -- Look for and sell efficiency in energy consuming products. We should use every effort possible to see that we use, that our customer uses the most efficient type of equipment even if it costs considerably more to design and to install. The rising cost of energy should help sell this.

Efficiencies must include not just the actual energy consuming appliance. Elimination of unnecessary things can save energy too. For example, some of you know I have long been an advocate of eliminating at least half of our wire sizes -- preferably two-thirds of them. Think of the tons of paper that would be saved annually by not printing all those useless wire prices! When did you last use some 450 MCM copper? Cable factories would become more efficient; offices would become more efficient; contractors would become more efficient.

I think NECA Research should begin developing a new set of wire and cable standard sizes, based on the metric system, to be adopted in eight or ten years whether or not the United States adopts the metric system.

3. -- Prepare yourselves for a price increase in energy and prepare your customers for a price increase in energy.

My personal belief is that we will see a tremendous rise in the cost of energy to large users.

Expect to pay for environmental improvements.



Dr. Robert B. Stobaugh of the Harvard Business School Energy Project had some interesting observations about rationing in an article in the Wall Street Journal of January 4, 1974. He categorically denied that consumers, either private or corporate, are insensitive to price changes. He believes that industry is quite cost sensitive to increases in energy rates.

Some people, notably Dr. Walter W. Heller, put forth a moral argument that higher prices are unfair and that, for example, if natural gas prices have been artificially depressed it is unfair to let them increase. But, Dr. Stobaugh answers that argument this way: "Millions of families, including mine, have been using natural gas at subsidized prices because the United States government has kept a price ceiling on interstate natural gas for years and now gives homes first priority on available supplies. Is it "fair" that I have much lower heating costs than my neighbors who have been subjected to large price increases because they are using imported heating oil? Is it "fair" that some of the extra natural gas used by homes because of its low price was taken away from chemical plants thereby causing unemployment? Is it "fair" that truck drivers are bearing an inordinately large share of current sacrifices? The potential disruptions to the economy are enormous.

At one time the petrochemical industry was low on the fuel priority list. But with the aid of an Arthur D. Little study showing that a 15% decline in organic chemical output could result in the loss of some 1.7 million jobs, the industry appealed to the government and was moved up higher on the priority list.

This "appeal to the U. S. Government" reminds us of some of the frightening by-products that could be generated from a rationing system. If rationing continues indefinitely, as it might well do once started on a grand scale, does any reader seriously doubt that some day in the future a campaign contribution might affect the amount of fuel a firm or an industry gets? Even if campaign contributions don't affect fuel allocations, a rationing system clearly focuses a firm's attentions on its governmental relations. In contrast, a free-market system focuses corporate attention on saving energy.

Forty years ago we were in the depths of a great depression.

Fifty years ago we were in the lawless decade.

Sixty years ago we were in World War I.

Eighty years ago some folks in New York felt that it was impossible for that city to grow any more because the horse population required to sustain the economy was producing manure faster than it could be carried away. At the then current rate by the year 1900 the streets of New York would be buried in five feet of horse manure.

And one hundred years ago the New England house-wives were up in arms because whale oil was becoming short. How would they light their homes? And furthermore the cost of the whale oil that they could buy had doubled and tripled within the last year. They couldn't bear up under such a rate of inflation! The government must do something!

But those people in New York didn't know that Henry Ford was working on a way to remove the manure from the streets, and the New England house-wives didn't know that a young man named Tom Edison was working on a better way to light their homes.

In the words of the novelist Thomas Wolff "You can't go home again". In my opinion the way out of the present crisis is not through a turning back of the clock to go home to a by-gone age, but for continued advancement with a proper respect for, and perspective of, our history.