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ENERGY POLICIES AND ENVIRONMENTAL GOALS IN THE U.S.

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Fossil fuel consumption and the environment interact in two entirely separate areas: ground level air pollution and global climate changes. The first is measurable, observable, indisputably undesirable and its impact is largely local. The second is a scientific concept still in dispute and its predicted negative impact on the environment is not expected until well into the 21st century.

U.S. policy makers for the past two decades have concentrated on reducing ground level pollution, such as ozone formation and sulfur emission. So far, the results have been quite positive. Thus, while coal demand, almost all of it in the electric power sector, rose by 24% during the 1980's, sulfur dioxide (SO₂) emission from coal burning actually declined somewhat. Under the provisions of the Clean Air Act Amendments of 1990, we can expect this trend of rising coal consumption and declining sulfur emission to continue.

In the petroleum sector, the reduction in pollutants was even larger since petroleum demand remained flat during the 1980's. The decline in emission was particularly pronounced in the motor fuel sector which accounts for slightly over half of total U.S. oil consumption. Motor vehicle emissions dropped not only per vehicle (from nearly 1 ton in 1970 to 0.3 tons in 1990) but also for the U.S. as a whole (from 96 to 55 million metric tons) despite a continuous increase in total vehicle miles travelled. A principal factor in this reduction has been the continuous increase in the fuel efficiency of motor vehicles, partly mandated and partly through market forces. This trend can be expected to continue.

Another major cause for the reduction in exhaust emission has been the requirement for catalytic converters since 1975 and the simultaneous introduction of unleaded gasoline, both about 10 years earlier than in Europe. At the same time evaporative emissions from gasoline were also substantially reduced through the introduction of carbon canisters in cars. Since 1989 gasoline vapor pressure reduction has been required during the summer months and beginning next November, at least 1/3 of U.S. gasoline will require oxygenate additives during the winter months. Looking ahead, the Clean Air Act Amendments of 1990 will require a cleaner "reformulated" gasoline from 1995 on in areas stipulated by the EPA. By 2000, 2/3 of U.S. gasoline consumption may be of this type. Diesel fuel will also be made cleaner: from October 1993 on, the sulfur content will have to be reduced by 80%. Thus, automotive emission per car, per mile and for the U.S. as a whole will continue to decline throughout the 1990's and beyond.

Obviously, these changes require very large capital investments by the U.S. refining industry. Estimates are on the order of \$35-40 billion for the 1990's. Yet, most environmental activists have viewed these mega-changes as only a beginning of the move towards a cleaner environment. If they prevail, the move toward environmentally cleaner motor fuels will only be a phase in the shift from oil to gas, electricity or renewables as a transportation fuel. An indication is the recent "opting-in" by several states in the U.S. Northeast to the mandated requirement in California that a growing share of all new vehicles from 1998 on have to be electric. The fact that the air pollution in these states is lower by a magnitude than in California, as certified by the Environmental Protection Agency, has been brushed aside in favor of the politically correct image of being in the forefront of the move towards a cleaner fuel.

It is interesting to consider that for the foreseeable future, the recharging of the batteries of these electric cars would come largely from electricity generated by coal which accounts for 55% of U.S. power generation and for an even higher share during off-peak hours when the recharging would presumably take place. Thus, air pollution may just be transferred, rather than reduced, by this action.

However, the environmental activists' main target in the U.S. has been oil rather than coal, even though all forecasts show coal consumption rising faster than oil in the 1990's and beyond. The different approach may reflect political and economic considerations. U.S. coal is a domestic commodity with a high labor intensity. By contrast, oil is not labor intensive and over 40% of U.S. requirements are imported, much of it from what are called "insecure" sources. Thus, it is argued, reducing oil consumption would benefit not only the environment but also the economy. This is not the place to discuss the merits of these claims. But it may be worth pointing out that most industrial, as well as industrializing countries, including such economic super powers as Germany and Japan, have long depended for almost all their oil needs on imports but have not considered it necessary to take action to reduce this dependency for economic or strategic reasons.

The oil industry and the environmental movement are by no means always in a confrontational position. They frequently cooperate on research and implementation of legislation and regulations. However, the oil industry wants a growing market in which it can sell its products at a profit. The U.S. environmental movement, on the other hand, has indicated that it wants to see oil consumption permanently reduced, both through replacement by other fuels and through a reduction in fuel consumption. They view cost increases caused by environmental legislation as justifiable, even desirable, externalities.

From an image point of view the environmental movement usually has an advantage over industry, particularly the oil industry. However, this does not mean the public interest is better served by the environmentalists. If areas with one or two environmental "non-attainment" days per year adopt the same standards to reduce groundlevel ozone formation as Los Angeles which had 104 such days in 1990, the cost would be so disproportionate relative to the marginal benefits that, on balance, it would not be in the public interest. Yet, it is being advocated.

Several oil companies, as well as the EPA, have recently suggested that a quick reduction in air pollution in "non-attainment" areas could be achieved by stricter inspections of old cars and the removal of high-polluting vehicles (mainly the 32 million registered pre-1980 models) through cash incentives. According to the EPA, "the dirtiest six percent of the cars on the road emit 50% of total (automotive) hydrocarbons." If the environmental movement's primary concern is a speedy reduction of automotive emissions, and not the ideology of phasing out gasoline, it should support this proposal as an alternative to further changes in gasoline composition or reductions in gasoline consumption beyond those already on the books.

Regarding global warming and CO₂ emission which were given front page treatment during the recent Rio conference, the reality for the U.S. is that CO₂ emissions will keep rising at least for the next 10 years since all three fossil fuels will show increases in demand. In 1990, oil was the principal contributor to CO₂ emission with 42% of the total. However, coal, which contributes 37%, will be the principal source of the growth in CO₂ emission since its consumption is expected to grow twice as fast as oil's and since each BTU of coal emits twice as much CO₂ as oil.

In the longer run the growth in CO₂ from electric power generation can be curbed through demand management and through gas-fired turbines, with distillate oil as a back-up, in new power installations. In the post-2000 period this could lead to a progressive reduction in total CO₂ emission. Given the continuing uncertainty as to when and whether global warming will occur and what its effects will be, this does not seem to be too slow a pace.