



HYPER-INDUSTRIALISM

BY DR. FRANK ELWELL



Thermodynamics

The first law of thermodynamics states that all energy in the universe is constant--it cannot be created or destroyed. Only its form can change, never its essence.

Thermodynamics

The second law, the entropy law, states that energy can only be changed in one direction, that is, from ordered to disordered.



Thermodynamics

Depletion and pollution are therefore an integral part of all life processes.





Thermodynamics

The intensification of the mode of production, that is the application of technology to the production of food and goods, is done at the expense of creating disorder in the environment.

Thermodynamics


In general, the larger and more complex the technology, the faster this transforming process occurs.





Environmental Impact

For example, a ten percent depletion of ozone in the last ten years

- will cause 2 million new cases of skin cancer,
 - a severe increase in cataracts,
 - and destruction of many immune systems.
- 

Environmental Impact

Material and Energy Shortages:

- Topsoil
- Timberland
- Fuel
- Water



Depletion

The most pressing concern caused by the intensification of the world's infrastructures is the accelerated rate of depletion of resources.

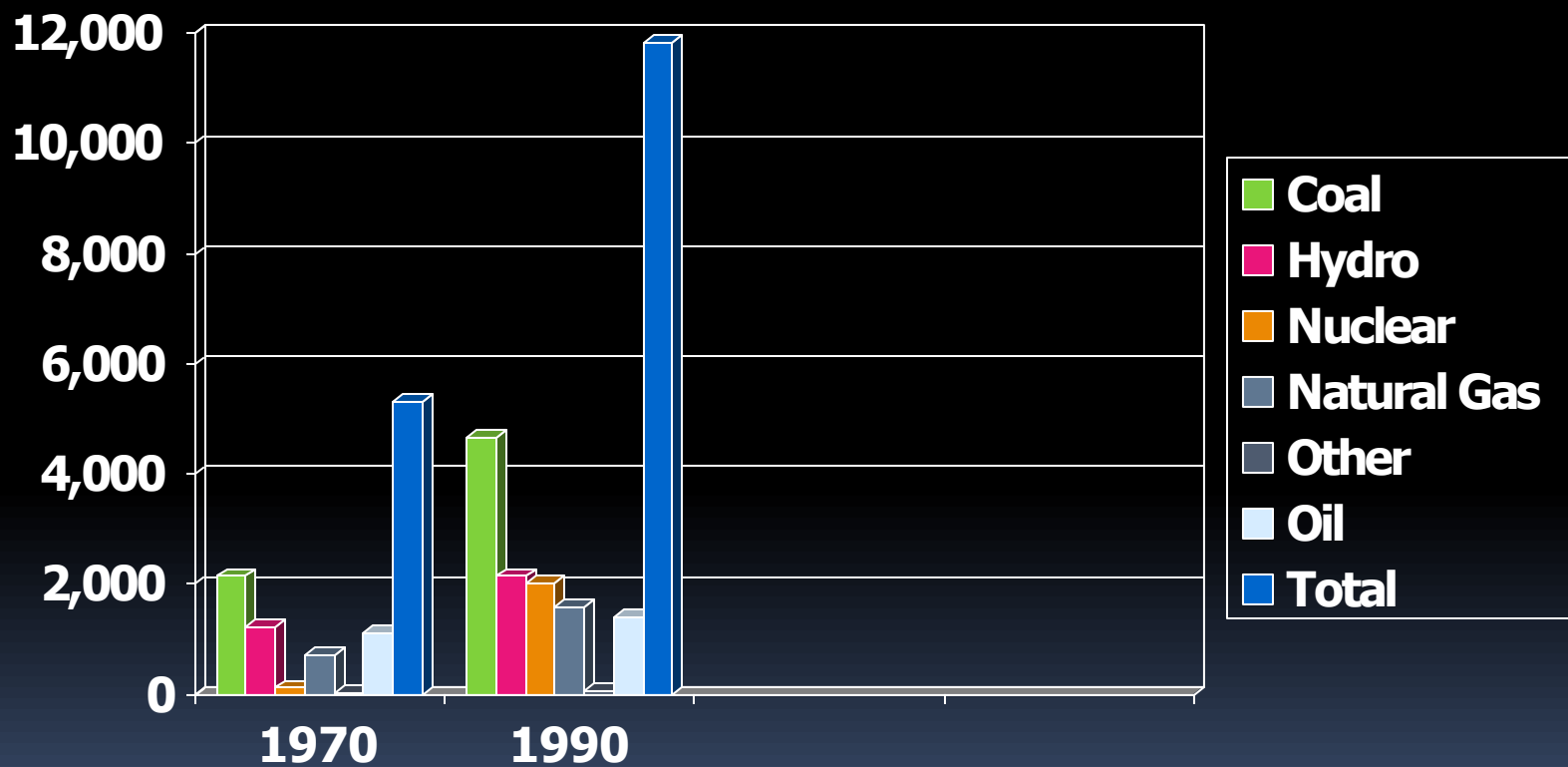


Depletion

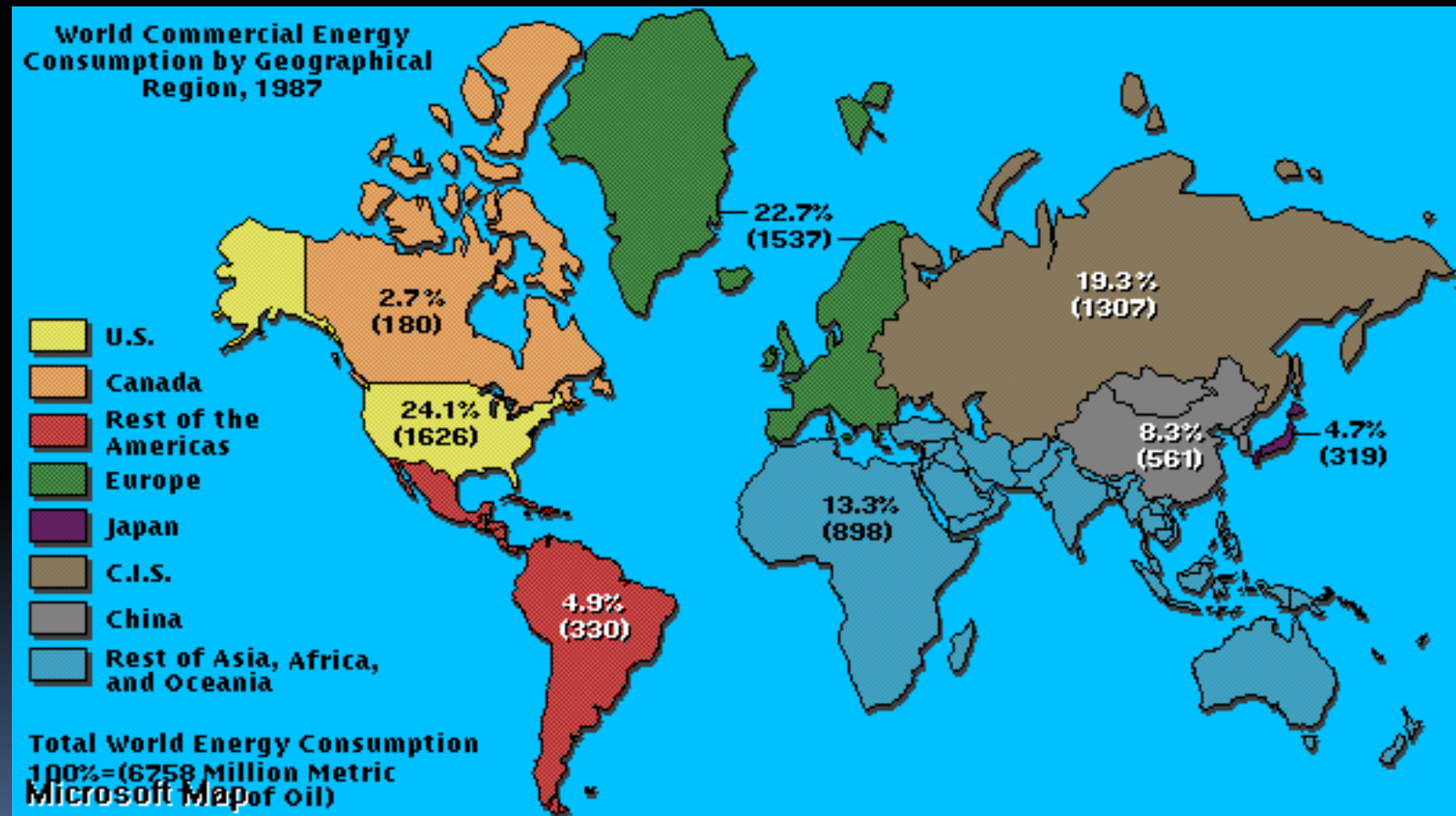
Total mineral extraction during the last 50 years was greater than that from the beginning of the Bronze Age until World War II.



World Electricity Production



World Commercial Energy Consumption:

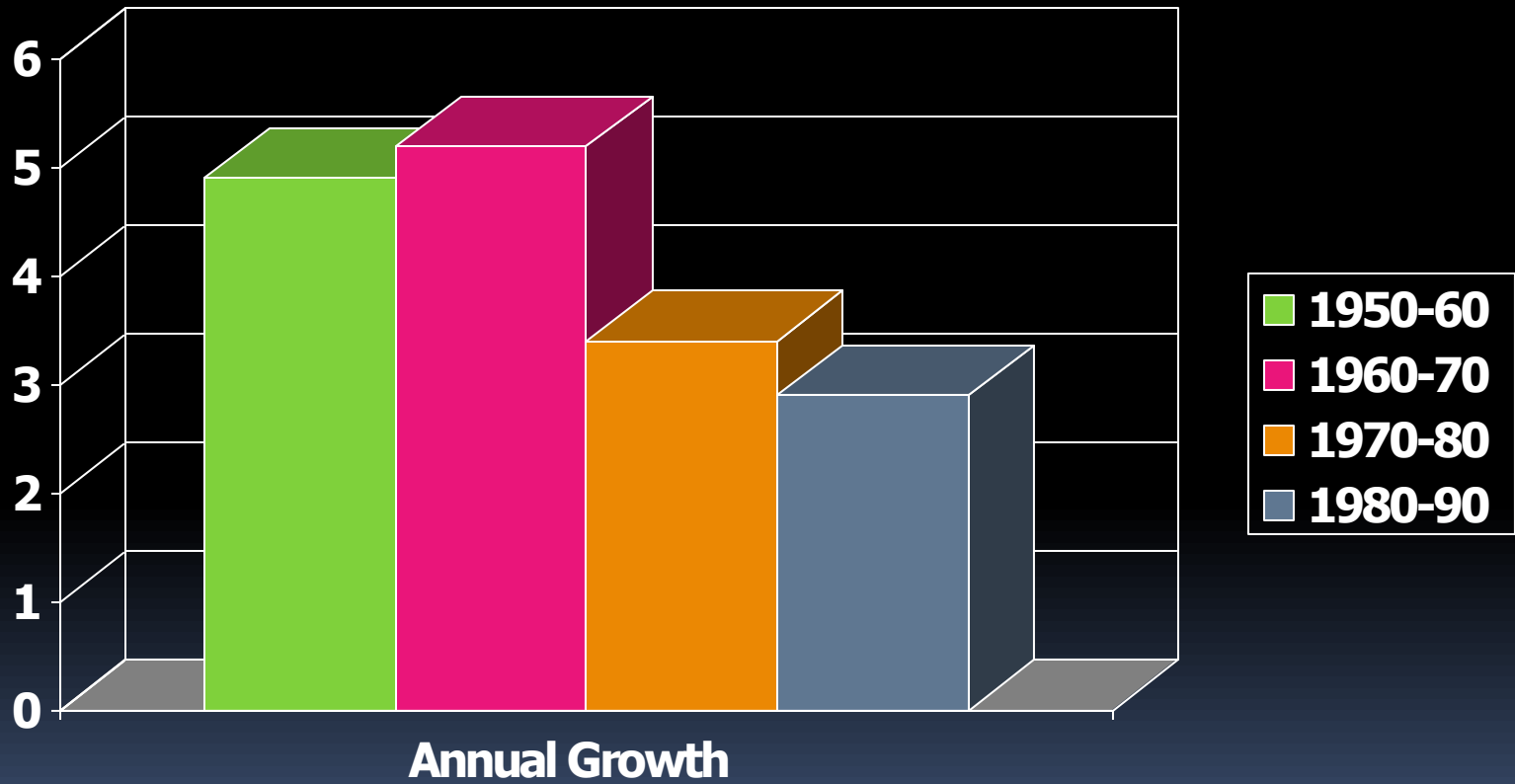




Depletion

The problem lies in the growth of the infrastructures. While natural resources are finite, the infrastructures of the world's societies are growing at an exponential rate.

World Economic Growth



World Economic Growth


At 3% annual growth, how long will it take the world's economy to double in size?





Exponential Growth: PopuLation


The factors that produce exponential growth can easily be seen with respect to population:

- Whenever there is an increase in population, two types of babies are being born.
 - Give one type about twenty years, and she produces more babies.
- 



Exponential Growth: PopuLation


An increase in the birthrate today not only increases the present population, but, after some delay to allow these babies to grow up and become parents themselves, increase the population of the future as well.





Exponential Growth: Industry

Industrial production also grows at an exponential rate. Again, the factors that account for this exponential growth are clearly discernable in the industrial sector.





Exponential Growth: Industry

Growth in industrial output consists of both the production of consumer goods (cars, textiles, furniture) and capital goods (steel mills, car factories, tractors and combines) . After some delay, these new capital goods are used to further increase industrial output.

Back to Thermodynamics

Industrial production, of course, eventually leads back to waste.



Rafael Macia, Photo Researchers, Inc.

Global 2000


World shortages of energy and raw materials, as well as pollution, are threats to the continuation of industrial or hyper-industrial societies.





Technological Fix

The technological fix strategy is to develop technological solutions to the problems of growth.



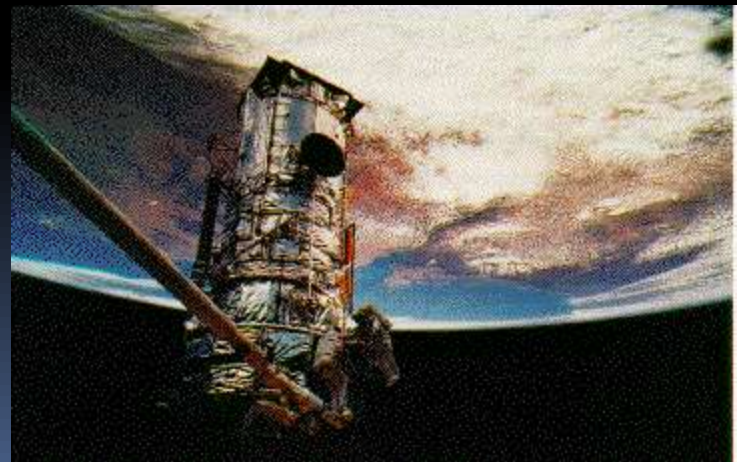
Technological Fix

But technological solutions must be technologically feasible, must be economically viable, and must be developed before they are needed.



Technological Fix

"Savior" technologies are by no means assured, they may be too costly to employ, and they are still bound by the ultimate limits of the earth.



Environmental Fit

The Environmental Fit strategy, often offered by environmentalists, centers on stopping industrial and population growth.



Environmental Fit


But all industrial nations (governments, corporations, financial institutions, and people) are firmly committed to continued intensification.





Conclusions:

By committing ourselves to economic growth we are betting that technological development can be achieved that will tap into almost infinite supplies of energy and raw materials...



Conclusions:


...with no delays in its development and deployment, at affordable prices, and with minimal costs to the environmental system.



Vanessa Vick, Photo Researchers, Inc.



New Technology has to:

- Provide more raw materials from a depleting environment
 - Provide an industrial life to the 80% of world population living in third world nations
 - Provide for the expansion of industrial economies
 - Provide for continuing population growth
- 

New Technology has to:

- Provide ever more efficient pollution control methods
 - To compensate for growth
 - To compensate for past abuse



New Technology has to:

Be economically feasible, and developed and deployed on time.





Conclusion:

To expect so much from technology borders on faith, not science.

