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Climate change: This house believes that tackling climate change means leaving fossil fuels behind completely and quickly

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Featured guest

Mr. Robert A. Hefner III 

The world's abundant, low-carbon natural gas is the natural bridge fuel to other non-carbon energy technologies, because natural gas has only one carbon molecule and four totally clean hydrogen molecules. Energy transitions are gradual, but can be significantly accelerated or delayed by government policy. Energy transitions are always the displacement of a less efficient, more primitive, dirtier fuel by a cleaner, more efficient modern fuel around which new groups of innovative technologies abound. The transition from coal and oil to the age of energy gases, natural gas, wind, solar and hydrogen is well under way. To attempt to leapfrog to totally non-carbon alternative energy sources will create significant and costly economic turmoil and displacement that unnecessarily damages the existing economic system. Rather, the acceleration of an ongoing transition tends to expand the economy and add jobs.

My book, *The Grand Energy Transition*, shows how civilisation itself, through trillions of energy decisions made continuously by all individuals on earth, is driving change within our energy system. That change is a grand transition from unsustainable, primitive, inefficient, dirty, high-carbon solid fuels, such as wood and coal, through what history will record as a brief liquid transition that used high-carbon oil and its products, to a millennia-long epoch that I call the age of energy gases.

Climate scientists have made it clear that we are encountering

accelerating risks to civilisation. The collapse of the financial system has revealed the instability that was created, at least in part, by the greatest transfer of wealth in human history from oil-consuming countries to oil-producing countries. Additionally, there has been no other time during which major oil-consuming nations have been so critically vulnerable to the potential of oil cutoffs by terrorists, political confrontations or even natural disasters. The importance of the grand energy transition is that its inexorable outcome is forecast by civilisation itself and, therefore, it shows us the way forward. It shows us the most likely energy winners and the most likely losers. This is so important to civilisation today, because to get it wrong with bad energy choices that will be with us for decades, if not generations, puts civilisation as we know it at risk.

As we face these escalating environmental, economic and geostrategic risks and take to heart the short time we have for their resolution, there is only one scalable, clean, efficient, abundant fuel that can meet the challenge in the near term, and it is natural gas. Yes, wind and solar are capable of meeting rapidly escalating portions of civilisation's demand for energy in the future, but because they are starting from such a low base and require many technological advances, it will take too long to count on them alone to solve these problems in the near term. Right now, because natural gas is scalable and flexible for both power generation and transportation, the acceleration of its use is the only way forward to achieve large near-term reductions in CO₂ emissions.

Natural gas is pervasive around the world and can be found on all continents in large quantities. Natural gas is found wherever there is coal, and countries with large coal deposits also have vast natural gas deposits, as proven by North America, Australia and Indonesia, and we will see in the future that this will also apply to China and India. Natural gas in North America has now proven itself to be sufficient to supply large new markets over and above our existing consumption and still last us some 100 years. America's natural gas infrastructure is vast, so the chicken-and-egg problem of infrastructure is well on the way to resolution. In fact, 63m American homes are already connected to the natural gas pipeline grid, and over 100m American automobiles return to these homes each day where they can be refilled with a simple home-fuelling appliance. Americans have invested over \$3 trillion in their gas guzzlers, SUVs and light trucks. We all know Americans love their big vehicles, and that is not the problem. The problem is the type of fuel in their tanks, so we must retrofit them so that the tanks hold natural gas and not gasoline, diesel or biofuels.

The grand energy transition demonstrates that liquid fuels, including biofuels, are in a long decline and will not be a long-term solution for our oil addiction.

So, in the near term, if the United States truly wants to be energy-secure, to accelerate the reduction of CO₂ emissions, to revive its domestic economy through the development of its own natural resources and to stop the massive transfer of its wealth to foreign oil producers, then it must implement two major policies. One is to convert at least half its automobiles to natural gas. This will cut oil imports in half, to about 6 million barrels per day, and CO₂ emissions by some 250m tonnes per year. The other policy is to run the already built natural gas power plants at capacity to back out coal-supplied electricity. There are 450,000 megawatts of natural gas generating capacity that today runs at only 40%, as compared with coal's 336,000 megawatts that runs at 75% capacity. Mandating natural gas first where possible would eliminate about one-third of coal-fired electricity and would immediately lower CO₂ emissions by 350m tonnes per years (natural gas emits about 50% less CO₂ than coal). Together, these two measures will add rapidly to the expansion of the domestic economy through more jobs, payments to Americans for its own energy sources, and the elimination of trillions of dollars that would otherwise be sent to foreign oil producers over the coming decades.