Tackling Climate Change:

A System of Systems Engineering Perspective

A Research Seminar by

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Abstract

An integrative and adaptive approach to Responsible Governance is put forward for addressing climate change based on a System of Systems (SoS) Engineering framework that reflects the values of stakeholders using a participatory approach and achieves desirable systems goals such as resilience, sustainability and fairness. Currently, the world is suffering from an "Atmospheric Tragedy of the Commons" in which every nation is knowingly releasing deadly greenhouse gases in order to selfishly maximize its own economic benefits at the expense of destroying the "Atmospheric Commons" and thereby causing severe climate change which will adversely affect all countries around the globe. To overcome this strategically unwise type of individual behavior, a cooperative approach to good governance is suggested which will benefit every nation economically in the long term and, more importantly, satisfy ethical systems objectives. More specifically, the "Fee and Dividend" concept devised by James Hansen and others is suggested as a truly insightful, yet simple, method for solving the tough strategic decision-making aspects of climate change via: (1) Taxing carbon at its source or point of first sale (Fee). (2) Distributing 100% of this tax uniformly to all citizens (Dividend). (3) Negotiating a level of tax for each nation (Liability). (4) Increasing the tax over time in combination with stricter regulations to bring atmospheric carbon accumulation to a stipulated level (Survival). When compared to other alternatives, such as Cap and Trade, the "Fee and Dividend" idea may form the basis of a feasible and sensible method for handling climate change in the same way that the 1987 "Montreal Protocol on Substances that Deplete the Ozone Layer", and its extended versions thereof, constitute exceptional international agreements for cooperatively controlling the size of the ozone hole before it reached the point of no return. Indeed, the citizens of the world are most grateful to the truly remarkable scientists, consisting of Mario Molina, Paul Crutzen and Frank Rowland, who received the 1995 Nobel Prize for Chemistry for explaining how CFCs created the

ozone hole. In fact, responsible governance is not only needed in proactively combating climate change and the ozone hole but in many other highly interconnected complex SoS problems such as the failed American financial system, growing gap between the rich and poor, unfair medical systems, irresponsible energy production and usage, widespread pollution of both natural and societal systems, and unreliable aging infrastructure. Accordingly, extensive research is urgently needed for developing a comprehensive theoretical structure for System of Systems Science and Engineering for suitably solving current and emerging complex systems problems.

Related References

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