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Abstract

Governments' policy towards climate change is dangerously unbalanced. Although more than a Trillion Euro-equivalents have already been spent in preparation for possible problems caused by rising global atmospheric temperatures, there has been essentially no funding in anticipation of possible problems caused by falling atmospheric temperatures. This policy stance is unsatisfactory from the point-of-view of both risk analysis and cost benefit analysis, since more than 10 times more people die of cold every year than die of heat, and there is growing evidence that the Earth is now in the early phase of another "Little Ice Age".

At the international SPS conference in Kobe in 2014, Professor Ge Changchun noted that "guerilla snowstorms" which dump snow to a depth of a metre or more in a few hours have grown more frequent in recent years in North-East Asia, and proposed the use of high-power microwave-beams transmitted from orbiting satellites as a counter-measure.

Fortunately, much of the work that has been done in recent decades to develop space-based Solar Power Stations (SPS) for transmitting microwave power to large-scale receiving antennas at the Earth's surface for electricity generation, could easily be used to melt snow over large areas of the Earth's surface. Moreover, the cost of using SPS systems as "Snow-Melting Satellites" (SMS) would be less than 50% of the cost of supplying microwave energy for electricity generation, since there would be no need for multi-square-kilometre "rectennas" on the Earth's surface, and the technical constraints on the quality of the microwave-beam in terms of pointing accuracy, continuity, control of intensity and other parameters would be looser. The paper advocates urgent development of a satellite to demonstrate microwave power transmission from low Earth orbit to the surface, which would contribute greatly to both SMS and SPS development.

A short bio

Patrick Collins is Chairman of the Society for Space Tourism of Japan (SSTJ) and Emeritus Professor of Azabu University, where he taught economics for 19 years. Earlier he was a Guest Researcher at the Research Center for Advanced Science and Technology of Tokyo University (RCAST), the National Space Development Agency (NASDA), the National Aerospace Laboratory (NAL) and the Institute for Space and Astronautical Science (ISAS) in Japan. Before that he was Senior Lecturer at Imperial College in London, where he earned his PhD on the economics of solar power satellites, while also working as a part-time researcher at ESTEC. He is a Vice-President of Space Renaissance International. The focus of Dr. Collins's research for the past 40 years has been how to stimulate growth of commercial space activities, the two most important opportunities being tourism and solar power satellites, including their use as snow melting satellites (SMS), about which he has written some 200 papers.