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THE PROGRESS OF KOREAN SPACE SOLAR POWER SATELLITE'S CONCEPTUAL DESIGN AND ITS CIRCUMSTANCES

Abstract

Scientists say the worst Australia wildfire, recently occurred, is mainly due to climate change and this fire increases the greenhouse gas concentration to accelerate climate change in return. This incident gives us a lesson that energy paradigm should be changed from fossil fuel to reusable energy much faster than current movement. Among the several options, the most promising way for Korean to get reusable energy could be to develop Space Solar Power Satellite(SSPS), even though current technologies are not fully developed for a commercial SSPS, when we consider its small territory and geological environment since the nuclear energy option is discarded by Korean government due to potential nuclear power plant accidents. This paper covers overall activities for SSPS in Korea since the design concepts of Korean space solar power satellite(K-SPSS) was released internationally for the first time at IAC 2019. In particular, Korea Aerospace Research Institute(KARI) declared KARI vision 2050 in late 2019 to commemorate 30th anniversary of its founding. KARI vision 2050 has 19 strategic goals in RD area in order to effectively respond changes of mega trends and paradigms which would occur for the next 30 years. In a timely manner, the development of K-SSPS is selected as one of the 19 strategic RD goals to cope with strengthening renewable energy dominance. According to the vision, SSPS is demonstrated in a low earth orbit in 2040 while it is demonstrated in a geostationary orbit in 2050. Even though the system development of K-SSPS is not funded yet as a national project, there are some progresses in core technology developments. For examples, a deployment mechanism which can be used for the transmission antenna is being developed and its availability was proved in small scale(5 by 5 panels, 120mm square shape panel). In addition, wireless power transmission of 4.8kw(transmission power) was successfully conducted at 110m distance by Korea Electro-Technology Research Institute.