

SPACE SOLAR POWER: THE FIRST INTERNATIONAL ASSESSMENT

INTERNATIONAL ACADEMY OF ASTRONAUTICS REPORT

November 14, 2011 press conference participants:

George Dietrich President, SPACE Canada

**Mark Hopkins Chair of the Executive Committee,
National Space Society**

**John Mankins World's Leading Space Solar Power
Expert**

National Space Society

- World's leading grassroots advocacy organization for the human space program
- Created in 1987 by a merger of two earlier organizations, one of which founded by Wernher von Braun in 1974
- *Ad Astra* magazine
- Over 50 Chapters around the world
- International Space Development Conference
- NSS Executive Director, George Whitesides left NSS in 2009 to become the Chief of Staff at NASA. Now CEO and President of Virgin Galactic.
- Former NSS Executive Director, Lori Garver is now the Deputy Administrator (No. 2 position) at NASA.

Acknowledgements

- Co-sponsor SPACE Canada and its President, George Dietrich
- Dale Skran

Space Solar Power Description

- Numerous options, which is a strength
- Base case: An array of solar cells in space make electricity from the sun's energy, which is converted to a microwave beam, sent to Earth and then converted back to electricity
- Seven times more energy in space per unit area as compared to the ground
- Avoids the need for expensive energy storage

Most Important IAA Report Finding

“Economically viable Solar Power
Satellites appear achievable
during the next 1-3 decades...”

Benefits

- An almost unlimited source of energy.
The sun produces 1 to 10 **TRILLION** times the amount of energy currently used by humanity.
- Environmentally benign:
Beam not a problem. Naked humans can walk through. Birds can fly through.
- Almost zero carbon dioxide produced.

Additional Benefits

- Energy Independence: America spends \$700 billion per year on oil imports.
- Net Energy Exporters: Space Solar Power can be sold and beamed to any nation. America could become the world's largest energy exporter.
- According to the IAA study, "...annual employment on the order of 5,000,000 individuals might be realized eventually."
- Potential energy wars might be avoided.

The Kalam – National Space Society Initiative

- Dr. A. P. J. Abdul Kalam is:
 - Former President of India
 - Project Director for India's first satellite launcher
 - The former Scientific Advisor to the Defense Minister of India
 - Currently, Chancellor of the Indian Institute of Space Science and Technology
 - Known as the ‘Missile Man’ of India
- The initiative is aimed at promoting a bilateral American/Indian Space Solar Power Program
- Next step: NSS will soon send a delegation to meet with Dr. Kalam in India
- Participation by other nations is encouraged

Long Run Implications (Speculative)

According to Wang Xiji, a founder of the Chinese space program, "The development of a solar power station in space will fundamentally change the way in which people exploit and obtain power...Whoever takes the lead in the development and utilization of clean and renewable energy and the space and aviation industry will be the world leader..."

John Mankins

- Co-Chair of the IAA study
- President, Space Power Association
- 25 year career at NASA
- While at NASA, led an \$800 million per year R&D program
- For many years he was in charge of the studies at NASA of the concept of Space Solar Power
- World's leading expert on Space Solar Power