

## Position Statement #12

# Fusion Energy



The American Nuclear Society (ANS) encourages a vigorous international research and development program for fusion energy, underpinned by a world-class domestic program that allows the United States to maintain its leadership in key fusion science and technology areas. Fusion energy is sustainable, has favorable safety and environmental features, and uses fuels that are abundant and inexpensive. Fusion has the potential to generate large amounts of energy while emitting virtually no greenhouse gases that contribute to global warming. Global energy needs continue to grow and the United States must invest in advanced technologies, such as fusion, that will provide sustainable high-density energy generation.

The ANS recognizes that scientific and technical challenges remain before a sustainable fusion energy power industry will be realized. However, advances in fusion sciences have already contributed to significant advancements in science, technology and benefits to human health and the environment. As a matter of policy, the ANS advocates the following:

1. The long-term development of fusion energy requires a sustained and intensive effort aimed at advancing fusion science and technology. International cooperation is an essential part of this effort but the United States must be a full partner and maintain a robust domestic fusion science program and technology infrastructure. The ANS encourages efforts to commercialize fusion technology.
2. The future of fusion energy sciences requires a sustained commitment that can only be achieved through advanced science machines and the international collaborations required to develop and operate them.<sup>1,2</sup> The United States must make long-term and large-scale commitments to the design, construction and operation of such facilities to advance fusion science and technology both domestically and through international partnerships.
3. To maintain a leadership position in key pillars of fusion science and technology, the United States must invest the resources required to train the next generation of American fusion scientists and engineers in areas beyond plasma science such as materials science, breeding blanket technology, fuel cycle processing, fusion systems engineering, and consideration of the safety, environmental, and socio-economic aspects of fusion energy.
4. The United States should develop a robust domestic fusion nuclear science program with the goal of closing the knowledge gaps and understanding the complex challenges of fusion plasma material interactions, nuclear material interactions, tritium fuel management, and power extraction.

### References

1. ITER Web Site: <http://www.iter.org>
2. Lawrence Livermore National Laboratory NIF Web Site: <http://www.llnl.gov/nif>

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