



NSE

SCIENCE. SYSTEMS. SOCIETY.

MIT Department of Nuclear Science and Engineering
Strategic Plan Update

June 2016



Our mission is to help develop the next generation of technical leaders of the global nuclear community and to provide technical leadership in energy and non-energy applications of nuclear technology. We also have a responsibility to inform public debates on the wise uses of nuclear science and technology.

1. Overview

This document describes our assessment of strategic plans for the MIT Department of Nuclear Science and Engineering. We refer to this report as Strategic Plan Update, to differentiate it from the strategic plan laid out in 2010. Our objective remains the same, to sustain and strengthen the Department's position at the international forefront of nuclear research and education over the coming decade, and overall, we will retain the foundations of the original strategic plan as we move forward.

This report:

- > **assesses** progress in implementing the strategic plan laid out in 2010;
- > **re-commits** the Department to the pursuit of new knowledge and advanced technologies for the next phase of nuclear energy development;
- > **identifies** developments and trends at MIT and around the world that NSE should capitalize on for the good of education in NSE and for the global nuclear research endeavor;
- > **recommends** expanded engagement with MITEL and edX/Professional edX as part of a broader NSE strategy to build stronger collaborations within MIT and beyond;
- > **advocates** maintaining emphasis on the 'science-systems-society' framework for our educational programs, and describes recent and planned innovation in our undergraduate and graduate curricula along these lines;
- > **proposes** a new educational and research focus on atomic engineering, to be pursued as a multidisciplinary collaboration;
- > **describes** several new initiatives, targeted at enhancing NSE's influence domestically and internationally;
- > **requires** a continued thrust to build the Department's faculty, backed by a comprehensive approach to faculty development.

The department is in a strong place at the moment, excelling in research, teaching and service. We have adhered to the vision of the last strategic plan, and via our motto of Science, Systems and Society in action we have made tremendous strides forward. By examining the current strategic plan and assessing our position, we have identified a variety of new opportunities on the horizon that NSE is poised to leverage for the benefit of the global nuclear endeavor in both education and research. By continuing to implement the strategic plan, we will position the Department as a leading contributor to the innovations needed for a major global expansion of nuclear energy, driven by the desire to curb carbon emissions, and to the development of the next generation of leaders of the nuclear energy community, while also laying the foundation for new applications of nuclear and radiation science and technology¹.

Jacopo Buongiorno

TEPCO Chair in Nuclear Science and Engineering and Associate Head
Department of Nuclear Science and Engineering
Director, Center for Advanced Nuclear Energy Systems
Massachusetts Institute of Technology
Room 24-206
77 Massachusetts Avenue
Cambridge, MA 02139
jacopo@mit.edu

Dennis Whyte

Hitachi America Professor of Engineering and Head
Department of Nuclear Science and Engineering
Director, Plasma Science and Fusion Center
Massachusetts Institute of Technology
Room 24-107
77 Massachusetts Avenue
Cambridge, MA 02139
whyte@mit.edu