

Rensselaer-Excelsior Partnership for Nuclear Sustainability: Advancing Preparedness through Education, Workforce Development, and Technology Innovation (RENEW)

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Program: Nuclear Reactor Safety Training and Workforce Development Program - Topic Area 2 (TA2)

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ABSTRACT:

The RENEW partnership program aims to enhance workforce training and safety education, develop and deliver innovative educational programs, and promote public awareness of the nuclear industry, all aimed at advancing sustainable energy solutions that support U.S. energy independence, environmental considerations, and economic growth. The U.S. Department of Energy (DOE) estimates that approximately 200 Gigawatts (GW) will need to be deployed by 2050. Proposed activities will foster a safety-conscious work environment that ensures the effective management of existing infrastructure while addressing the evolving needs of a future-focused industry. By leveraging advanced technologies, stewarding hybrid energy sources, and advancing reactor designs, this initiative will drive innovation, enhance sustainability, and support long-term energy resilience. Engaging in industry and public outreach and dialogue will shape curricular development, enhance academic credentialing, and expand public education programming, fostering a robust next-generation workforce pipeline while strengthening collaboration between industry, academia, and community partners.

The RENEW partnership program aligns with the U.S. Department of Energy’s mission to sustain existing reactors, deploy advanced technologies, and secure a sustainable nuclear fuel cycle. Through a multi-pronged approach, RENEW seeks to bridge the gap between skilled workforce demands and current training availability while driving technological and societal innovation.

The program’s activities will focus on three key areas:

- 1. Workforce Development and Training:** Leveraging cutting-edge technologies like AI, machine learning, and simulators, RENEW will enhance nuclear safety training and operational readiness. New credentials, such as the Small Modular Reactor (SMR) Safety Certificate and a Master of Business Administration (MBA) concentration in Nuclear Plant Management, will prepare professionals to lead in an evolving energy landscape. Programs will emphasize hands-on learning, regulatory compliance, and sustainability.



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2. **Public Engagement and Education:** Public outreach initiatives will dispel misconceptions and build trust in nuclear energy. Activities such as Youth Industry Discovery Days, Engineering Days at Rensselaer, K-12 curriculum development, and immersive upskilling programs for mid-career professionals will expand awareness and inspire interest in nuclear careers. Efforts will prioritize underrepresented communities, promoting diversity in STEM fields.

3. **Collaboration and Innovation:** Partnerships with industry, academia, and community stakeholders will inform policy development, enhance curriculum design, and drive workforce innovation. Thought leadership summits, modeled on Institute for Science for Global Policy's (ISGP) evidence-based dialogue framework, will address ethical, technical, and geopolitical challenges, generating actionable insights to guide program initiatives.

By combining education, technology, and engagement, the RENEW program aims to cultivate a future-ready workforce, strengthen community ties, and advance nuclear energy as a cornerstone of sustainable energy solutions.