Renewable Energy and Sustainability Systems Graduate Programs
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*Renewable energy and sustainability systems are key components of the modern economy, providing a foundation for meeting the world’s future needs for energy and economic development in a sustainable manner. This is a strategic concern for individuals, companies, communities, and nations, offering a dynamic opportunity for sustainable future growth. Working professionals can stay ahead of policy changes, technological advances, and the growing competition for the world’s resources with Penn State’s online intercollege Master of Professional Studies in Renewable Energy and Sustainability Systems (iMPS-RESS) programs.*

*The innovative iMPS-RESS programs are delivered by Penn State’s World Campus, a worldwide leader in online education. Designed in a strong partnership between four colleges and eight academic departments from within the University, the programs offer the opportunity for you to draw upon the expertise and unique perspectives of world-class faculty with diverse backgrounds.*

“The iMPS-RESS programs are designed to prepare professionals to lead the world’s transformation from an unsustainable, fossil energy economy to a renewable, sustainable basis of operation.”

—Dr. Ali Demirci
RESS Program Chair
Penn State’s iMPS-RESS programs can equip students with a thorough understanding of topics related to renewable energy and sustainability systems while providing in-depth coverage of select topics, including:

- bioenergy
- sustainability management and policy
- solar energy
- wind energy

The iMPS-RESS curriculum offers the flexibility that working professionals need to meet their learning goals. You can take the courses individually for professional development, as part of a graduate-level certificate, or to earn your master’s degree.

What Is an MPS Degree?
The master of professional studies is a professional degree that provides opportunities for you to increase your knowledge and competencies in specific careers. The curriculum provides foundational material that assumes students are coming from diverse backgrounds. Whereas other degrees focus more on research and theory, the MPS emphasizes practical skills that can be utilized immediately in your current position.

Not Sure Where to Start?
The credits you earn with one of the iMPS-RESS courses or certificates can be applied to the corresponding master’s degree if you are granted admission into that program.

worldcampus.psu.edu/ress
Become a Leader in Renewable Energy and Sustainability Systems

If you have a technical mindset and are interested in more fully understanding the systems behind renewable energy and sustainability, Penn State’s online iMPS-RESS programs are designed for you. Their overall objective is to educate you to become a technically outstanding expert in renewable energy and sustainability systems, with strong project development and leadership skills.

The programs are appropriate for you if you are already in the renewable energy field and are looking to further excel at your current position. You can also benefit if you are looking to move into the growing renewable energy industry.

The iMPS-RESS programs can prepare you to excel in a wide variety of commercial and industrial occupations that apply engineering principles to the business of energy. And, while each of the options requires slightly different backgrounds and interests, graduates should be equipped to perform their tasks in management and development of renewable energy systems, even if they have received their bachelor’s degrees in a technical area other than renewable energy and sustainability systems.
The 32-credit iMPS-RESS programs have been designed with a focused curriculum, along with the flexibility appropriate to a rapidly changing field. Professionals in this industry need technical depth in areas related to renewable energy, but they must also fully understand the applications of the technology in society, the energy economics, and the environmental constraints, as well as the entire project development process.

As part of the iMPS-RESS programs, you will take a number of core courses to help you meet the demands of the dynamic renewable energy and sustainability marketplace.

To tailor your studies even further, you may choose one of four program options (bioenergy, sustainability management and policy, solar energy, or wind energy) that will provide more specialized, technical instruction. Then, to meet your individual learning goals you will select additional courses from an array of electives.

Core Curriculum Courses

**BIOET 533**—Ethical Dimensions of Renewable Energy and Sustainability Systems (2 credits)

**EME 504**—Foundations in Sustainability Systems (3 credits)

**EME 801**—Energy Markets, Policy, and Regulation (3 credits)

**EME 802**—Renewable and Sustainable Energy Systems (3 credits)

Capstone Experience

**A B E 589**—Management and Design of Renewable Energy and Sustainability Systems (3 credits)

To complete the 32-credit iMPS-RESS degree, an additional 18 credits must be taken from a list of approved courses, including those from the four program options.
RESS—Bioenergy Option and Graduate Certificate

As the bioenergy industry continues to evolve, many companies will find it more challenging to find staff with appropriate training to meet their expanding R&D, management, and production needs. In the Bioenergy option of the iMPS-RESS program, you can learn skills in applied science, communication, business, and social and industry perspectives that companies will be looking for in the emerging bio-based economy.

Curriculum

The iMPS-RESS Bioenergy option can provide you with the necessary graduate-level instruction to advance your career in the bioenergy industry. The curriculum covers important components of the industry, including:

- crop production
- harvesting
- storage
- ecology
- genetics
- fermentation
- engineering
- value chain systems
- modeling
- marketing
- economics
- sustainability

Required Bioenergy Option Courses

**A B E 884**—Biomass Energy Systems (3 credits)

**A B E 885**—Biomass Harvesting and Logistics (3 credits)

**A B E 888**—Conversion Technologies for Bioenergy Production (3 credits)

**FOR 880**—Bioenergy Feedstocks (3 credits)

You have the flexibility to take these 12 credits of required option courses to earn the Bioenergy Graduate Certificate and use those 12 credits toward your 32-credit iMPS-RESS degree with the Bioenergy option, if you are granted admission into the master’s program.

*A background in science or engineering is advised for students in this option or graduate certificate.*
RESS—Sustainability Management and Policy (SMP) Option and Graduate Certificate

Sustainability is a core strategic focus for private industry and government sectors alike. The need will continue to expand for professionals with a deep understanding of the science of sustainability, combined with acumen to assess risk and plan for renewable energy projects, as well as the communication skills to develop new policy implementation. The Sustainability Management and Policy option of the iMPS-RESS program will help you excel in the growing fields of renewable energy, energy trading, and sustainability systems management.

Curriculum

Organizations will need leaders at every level who can help maintain an enterprise-wide focus on sustainability by providing a real-world, meaningful framework for their co-workers. To help you become a leader in the sustainability movement, the iMPS-RESS SMP option offers you an advanced education centralized in:

- the science of sustainability
- analysis of market and nonmarket strategies
- potential for future products and markets
- analysis of energy policy development
- technologies for developing sustainability systems
- systems thinking approaches to unify the project development approach

Required SMP Option Courses

**B A 850**—Sustainability-Driven Innovation (3 credits)

**EME 803**—Applied Energy Policy (3 credits)

**EME 805**—Renewable Energy and Nonmarket Enterprise (3 credits)

**EME 807**—Technologies for Sustainability Systems (3 credits)

You have the flexibility to take these 12 credits of required option courses to earn the Sustainability Management and Policy Graduate Certificate and use those 12 credits toward your 32-credit iMPS-RESS degree with the Sustainability Management and Policy option, if you are granted admission into the master’s program.
NESS—Solar Energy Option and Graduate Certificate

Solar power is a key component of the growing renewable energy economy, with jobs expected to grow in all major sectors. As solar technology continues to evolve, there will be an increased demand for skilled experts. The Solar Energy option of the iMPS-RESS program can create graduates who can successfully move projects forward in the solar energy industry.

Curriculum

Courses in the iMPS-RESS Solar Energy option will allow you to choose from parallel paths of study that focus on electric or solar thermal strategies, from large-scale or from the distributed approach, in alignment with your interests and strengths.

The curriculum will cover topics such as:

- solar resource assessment for selected locales
- effective communications to maximize the solar economic utility to the client/stakeholders
- thermal- and electric-derived solar conversion technologies
- design in hybridized solar systems design
- social and policy context of solar systems project design

Required Solar Energy Option Courses

Students are required to complete the following 6 credits:

A E 878—Solar Project Development and Finance (3 credits)
EME 810—Solar Resource Assessment and Economics (3 credits)

Students must also select 6 credits from the following courses:

A E 862—Distributed Energy Planning and Management (3 credits)
A E 868—Commercial Solar Electric Systems (3 credits)
EME 811—Solar Thermal Energy for Utilities and Industry (3 credits)
EME 812—Utility Solar Power and Concentration (3 credits)

You have the flexibility to take these 12 credits of required option courses to earn the Solar Energy Graduate Certificate and use those 12 credits toward your 32-credit iMPS-RESS degree with the Solar Energy option, if you are granted admission into the master’s program.

A background in systems science, engineering, or physics is strongly recommended for students interested in this option or graduate certificate.
Projected growth in the global wind industry indicates an increasing need for professionals with advanced degrees. As wind becomes a more common source of electric power generation, companies will continue to look for professionals who have a broad understanding of the wind project development process, as well as technical depth in turbine technology and the science of properly siting wind turbines. The Wind Energy option of the iMPS-RESS program can help you understand the current technical challenges of wind project development, as well as lead industry advancements into the future.

**Curriculum**

The iMPS-RESS Wind Energy option provides a balanced curriculum that can equip you to lead the advancement of the wind energy industry by enhancing both your technical understanding and project management skills. Upon your successful completion of the program, you should be able to:

- model wind farm performance
- understand the complexities of permitting and logistics
- conduct turbine load and acoustic analyses
- recognize the limitations of models

**Required Wind Energy Option Courses**

**AERSP 583**—Wind Turbine Aerodynamics (3 credits)

**AERSP 880**—Wind Turbine Systems (3 credits)

**AERSP 886**—Engineering of Wind Project Development (3 credits)

You have the flexibility to take these 9 credits of required option courses to earn the Wind Energy Graduate Certificate and use those 9 credits toward your 32-credit iMPS-RESS degree with the Wind Energy option, if you are granted admission into the master’s program.

*A background in incompressible fluid mechanics, statics, and dynamics is highly recommended for students interested in this option or graduate certificate.*
Frequently Asked Questions

➢ **Why is Penn State World Campus the best choice for me?**

*Flexibility and convenience:* Penn State knows that as an adult student, you need flexible and convenient learning options. The online learning format offered by Penn State World Campus makes it possible to fit a graduate education into your life.

*Reputation:* Penn State is universally regarded as one of the finest educational institutions in the United States. Putting a Penn State degree or certificate on your résumé is a great way to broaden your career options and prove to current and potential employers that you are a well-educated professional.

*Faculty expertise:* The iMPS-RESS programs offer the opportunity for you to draw on the experiences and unique perspectives of faculty with diverse backgrounds and world-class expertise.

➢ **Does World Campus offer learner and technical support?**

Without having to set foot on campus, you will have access to many of the same support services that residential students enjoy, including advising, course scheduling assistance, and technical support.

➢ **Can I obtain financial aid to pay for my courses?**

Penn State realizes that one of the biggest challenges of returning to school is the cost. That’s why our advisers are trained to help you make the most of the financial aid opportunities available to you.

➢ **Is this the real Penn State?**

Yes. Penn State values online education as highly as it does resident instruction. No distinction will be made on your official Penn State transcript or diploma that your courses were completed at a distance.

➢ **Is Penn State experienced in distance education?**

As a distance education pioneer, Penn State has developed a nationally recognized support system for students who are geographically removed from campus. Penn State World Campus has many years of experience providing global access to high-quality, rigorous, research-based education that embodies the best practices in online teaching and learning.
Penn State's online iMPS-RESS programs are suitable for individuals of diverse backgrounds. However, for your admission to any of the programs, it is preferred that you have a technical background and are interested in more fully understanding the systems behind renewable energy and sustainability.

**Your master’s application portfolio must include:**

- online application form and fee
- statement of purpose
- vita or résumé
- three letters of recommendation
- two official transcripts from each higher education institution attended
- official GRE scores
- TOEFL or IELTS score, if applicable

For more information about these portfolio items or to start your application, please visit our website: [worldcampus.psu.edu/ress](http://worldcampus.psu.edu/ress)

**Graduate Certificates**

When applying to a certificate program, you will need to complete the Penn State Graduate School Application and submit your nonrefundable fee.

Exemplary performance in the graduate certificate will be taken into consideration for your possible admission into one of the iMPS-RESS master’s programs, but completion of a certificate does not imply or guarantee admission into the master’s program.

**Did You Know?**

- Recruiters in a *Wall Street Journal* survey ranked Penn State as No. 1 for producing the best-prepared, most well-rounded graduates.
- Our online courses involve frequent interactions between students and with instructors.
- Penn State World Campus has enrolled students from all 50 states and all 7 continents.
- The iMPS-RESS program can expand your technical understanding and project management skills to help move sustainability projects forward.
For More Information

**Contact Us**
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800-252-3592 (toll free within the United States)
814-865-5403 (local and international)
814-865-3290 Fax

**Student Services Hours**
(inquiries and registration)
8:00 a.m.–9:30 p.m. ET Monday–Thursday
8:00 a.m.–5:00 p.m. ET Friday
Closed Saturday and Sunday

**Admissions Counseling Hours**
8:00 a.m.–8:00 p.m. ET Monday–Thursday
8:00 a.m.–5:00 p.m. ET Friday
Closed Saturday and Sunday

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