

**PROPOSAL FOR PROVISIONAL APPROVAL OF A NEW
UNDERGRADUATE MINOR IN
ENERGY AND ENVIRONMENTAL POLICY**

This proposal is submitted by the faculty of the Energy and Environmental Policy (ENEP) of the Center for Energy and Environmental Policy (CEEP) within the College of Engineering. It provides the curriculum and course information required by the University of Delaware Faculty Senate for a minor in Energy and Environmental Policy

**Center for Energy and Environmental Policy
Undergraduate Program Committee**

December 20, 2010

RESOLUTION FOR FACULTY SENATE AGENDA

To Create an Intercollegiate Undergraduate Minor in Energy and Environmental Policy

WHEREAS, the Undergraduate Minor in Energy and Environmental Policy addresses the critical issues of the energy sector and its environmental impacts; and

WHEREAS, the Undergraduate Minor in Energy and Environmental Policy examines the ways in which sustainable energy and environmental policies are developed and executed, and how such policies should be evaluated and monitored; and

WHEREAS, the Path to Prominence has established the goal of making the University of Delaware a national and international leader in education and research on energy and environmental sustainability; and

WHEREAS, the Undergraduate Minor aligns with the academic priorities of the University's stated goals to promote programs which engage in cross-disciplinary (or cross fertilization) efforts to create integrated and critically reflective solutions to the world's pressing energy and environmental challenges; and

WHEREAS, the Undergraduate Minor in Energy and Environmental Policy educates and builds core competencies and skills for students so that they may work effectively at the intersections of business, technology, government, research and civil society in order to improve energy and environmental policy; be it

RESOLVED, that the Faculty Senate approves provisionally, for four years, the establishment of a new minor in Energy and Environmental Policy, effective September 1, 2011

UNIVERSITY FACULTY SENATE FORMS

Academic Program Approval

This form is a routing document for the approval of new and revised academic programs. Proposing department should complete this form. For more information, call the Faculty Senate Office at 831-2921.

Submitted by: Dr. John Byrne Phone number 831-8405

Department: Center for Energy and Environmental Policy
Email address jbyrne@udel.edu

Action: Add Minor
(Example: add major/minor/concentration, delete major/minor/concentration, revise major/minor/concentration, academic unit name change, request for permanent status, policy change, etc.)

Effective term 11F
(use format 04F, 05W)

Current degree BS
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed change leads to the degree of: _____
(Example: BA, BACH, BACJ, HBA, EDD, MA, MBA, etc.)

Proposed name: Minor in Energy and Environmental Policy
Proposed new name for revised or new major / minor / concentration / academic unit (if applicable)

Revising or Deleting:

Undergraduate major /Concentration: _____
(Example: Applied Music – Instrumental Degree BMAS)

Undergraduate minor: _____
(Example: African Studies, Business Administration, English, Leadership, etc.)

Graduate Program Policy statement change: _____
(Must attach your Graduate Program Policy Statement)

Graduate Program of Study: _____
(Example: Animal Science: MS Animal Science: PHD
Economics: MA Economics: PHD)

Graduate minor /concentration: _____

Note: all graduate studies proposals must include an electronic copy of the Graduate Program Policy Document, highlighting the changes made to the original policy document.

List new courses required for the new or revised curriculum. How do they support the overall program objectives of the major/minor/concentrations)?

(Be aware that approval of the curriculum is dependent upon these courses successfully passing through the Course Challenge list. If there are no new courses enter "None")

NONE

Explain, when appropriate, how this new/revised curriculum supports the 10 goals of undergraduate education: <http://www.ugs.udel.edu/gened/>

The proposed undergraduate Minor in ENEP has six learning outcomes listed below with the goals of undergraduate education they support provided:

1. Students will have the ability to apply major concepts, theoretical principles to the solution of problems (Undergraduate goals #2 ,4 and 5 Critical Thinking, Social Responsibility, Interdisciplinary)
2. Students will have the ability to implement interdisciplinary analyses to evaluate the social, technological and ethical issues (Undergraduate Goals #2, #5, #10 Critical Thinking, Interdisciplinary, and International).
3. Students will know local, national and international energy and environmental policy and governance systems to effectively work in the field (Undergraduate Goals #9, #10 Diversity, International).
4. Students will have the ability to present written and oral reports of technical information clearly and concisely (Undergraduate Goal #1 Oral and Written Communication).

5. Students will have an appreciation of the importance and practice of professional ethics and standards in the field (Undergraduate Goal #4 Ethics) .
6. Students will have the ability to use computers for policy computations, data acquisition and data base searching (Undergraduate Goal #1 Information Literacy, Information Technology)

Identify other units affected by the proposed changes:

(Attach permission from the affected units. If no other unit is affected, enter "None")

NONE

Describe the rationale for the proposed program change(s):

(Explain your reasons for creating, revising, or deleting the curriculum or program.)

The undergraduate Minor aligns with the academic priorities of the University's stated goals to promote programs, which engage in cross-disciplinary efforts to create integrated and critically reflective solutions to the world's pressing energy and environmental challenges. The minor is designed to provide students with core knowledge of the energy sector and its environmental impacts. Students in a wide variety of majors from engineering to the social sciences and humanities with an interest in energy and environmental solutions will benefit from the program. The minor expands the academic programs administered by the Center for Energy and Environmental Policy.

Program Requirements:

(Show the new or revised curriculum as it should appear in the Course Catalog. If this is a revision, be sure to indicate the changes being made to the current curriculum and **include a side-by-side comparison** of the credit distribution before and after the proposed change.)

The minor consists of at least 15 credit hours in energy and environmental policy. In order to count toward the minor, a grade of C- or better is required. Required courses are:

ENEP 250 Introduction to Energy Policy

3 credits

This course introduces the field of energy policy and provides a substantive review of energy technology, resources and policies and the role of social, economic,

political, and environmental factors in shaping the energy sector. It surveys policy, technical and economic assessments of key energy options needed to achieve a more sustainable world, and the appropriate policy mechanisms to implement these options. This will be proposed as an addition to the list of the University Breadth Requirement in the Social and Behavioral Sciences category.

ENEP 425 Energy Policy and Administration

3 credits

This course prepares students to analyze at an advanced level the policies associated with different energy resources, technologies and uses. It teaches techniques to evaluate the role of social, economic, political, and environmental factors in energy policy choice. The course focuses on interrelationships among energy, environment, economy and equity considerations (so called 'E4' models). It considers the energy policy options needed to achieve a more sustainable world. This is currently one of the required courses for the Sustainable Energy Minor in the College of Engineering.

The student must take three (9 credit hours) out of the following five courses.

ENEP 402 Electricity Policy and Planning

3 credits

This course analyzes technological and regulatory policy evolution of electricity industry. Considers how technology innovations and policy regulatory actions have guided industry planning from its early days. This will be proposed as an addition to the list of the College of Engineering Supplemental Course List.

ENEP 410 Political Economy of the Environment

3 credits

Reviews major theories developed over last half century to explain nature and society relationships. Policy case studies of environmental justice, trade and environment, global climate change, and sustainable development are used to evaluate current range of political-economic explanations of nature-society relationships. International, national and local responses to these problems analyzed. This will be proposed as an addition to the list of the University Breadth Requirement in the History and Cultural Change category.

ENEP 424 Sustainable Energy Policy and Planning

3 credits

This course analyzes sustainable energy strategies in terms of their technology, economics, impacts on the environment and governance attributes. Policy options to facilitate a sustainable energy future are assessed. This will be proposed as an addition to the College of Engineering Supplemental Course List.

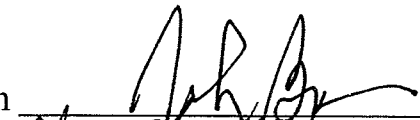
ENEP 426: Climate Change: Science, Policies & Political Economy 3 credits

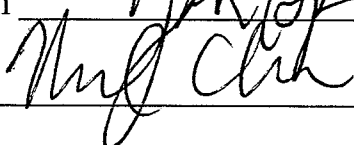
The course examines existing policy responses to climate change, alongside opportunities for a redirected political economy to achieve energy and environmental conditions with meaningful CO₂ reductions. Specific attention is given to possibilities and limits of scientific knowledge and technology in galvanizing social change. This will be proposed as an addition to the University Breadth Requirement in the Mathematics, Natural Sciences, and Technology category.

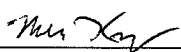
ENEP 470: Readings: Energy and Environmental Policy 3 credits

This course is a tutorial one and students are able to take it in Winter Session or Summer Session in addition to regular semesters (Spring and Fall).

ROUTING AND AUTHORIZATION: (Please do not remove supporting documentation.)

Department Chairperson  Date Jan. 11, 2011

Dean of College  Date 1/13/11

Chairperson, College Curriculum Committee  Date 1/13/2011

Chairperson, Senate Com. on UG or GR Studies _____ Date _____

Chairperson, Senate Coordinating Com. _____ Date _____

Secretary, Faculty Senate _____ Date _____

Date of Senate Resolution _____ Date to be Effective _____

Registrar _____ Program Code _____ Date _____

Vice Provost for Academic Affairs & International Programs _____ Date _____

Provost _____ Date _____

Board of Trustee Notification _____ Date _____

Revised 10/23/2007 /khs

Presentation of Requirements in Undergraduate Catalog Format

This minor is offered through the Center for Energy and Environmental Policy. To enroll in this minor program, the student must have permission of the Director, who will assign the student a minor advisor. To qualify for a Minor in Energy and Environmental Policy, students must complete 15 credits in accordance with the requirements specified below. A minimum grade of C- must be achieved in each course qualifying for the Minor. For inquiries regarding the Energy and Environmental Policy Minor, contact the Center for Energy and Environmental Policy at (302) 831-8405 or jbbyrne@udel.edu.

CURRICULUM

All students must take the following two courses:

ENEP 250	Introduction to Energy Policy (Spring)	3
ENEP 425	Energy Policy and Administration (Fall)	3

The student must take three (9 credit hours) out of the following five courses:

ENEP 402	Electricity Policy and Planning (Fall)	3
ENEP 410	Political Economy of the Environment (Spring)	3
ENEP 424	Sustainable Energy Policy and Planning (Spring)	3
ENEP 426	Climate Change: Science, Policies and Political Economy (Spring)	3
ENEP 470	Readings: Energy and Environmental Policy (Fall/Spring)	3

I. DESCRIPTION

The undergraduate Minor in Energy and Environmental Policy (ENEP) will provide students with an inter-disciplinary series of courses that are focused on local, national and global energy and environmental issues in complex, real world contexts. The ENEP Minor will prepare its graduates with the knowledge and tools in the field to address issues in energy and environmental analysis, planning and policy development. Core knowledge of the Minor includes an understanding of local, national and global energy and environmental issues and the policy options for addressing them in the public and private sectors. This includes the policies related to local, national and international policy and governance systems, and environmental impacts of energy utilization.

The ENEP Minor draws from undergraduate courses offered by the Center for Energy and Environmental Policy. The Center provides a comprehensive undergraduate and graduate curriculum that combines technical expertise, theoretical preparation and practitioner experience. Utilizing the experience of the innovative undergraduate Major, and Master's and Doctoral degrees in Energy and Environmental Policy,¹ the proposed undergraduate Minor seeks to engage students in creative and unconventional approaches to problems of theory and practice, and to provide them with the requisite skills to contribute to the field in international, national and local contexts.

Contemporary energy and environmental problems require educated individuals who are able to bridge these disparate fields in order to develop sustainable alternatives and to facilitate policy choices toward a path of ecologically sound and socially equitable solutions. Public policy actors increasingly require analytical advice built on inter-disciplinary knowledge that can be applied to address the practical needs of near-term policy as well as longer range planning to achieve sustainable energy objectives at the international, national and community levels. Students informed about the operations of multi-scale governance and economic systems will be well equipped to address the complex set of factors influencing our

¹ The University of Delaware approved an intercollegiate Undergraduate Major in 2009, and a graduate program in Energy and Environmental Policy (ENEP) in 1998. Currently, it has 56 students enrolled. The Center for Energy and Environmental Policy administers the cross-disciplinary, intercollegiate ENEP graduate program under the direction of the Dean of the College of Engineering. The program is supported by faculty in the Colleges of Agriculture & Natural Resources, Arts & Science, Engineering, Human Services, Education & Public Policy, and Marine & Earth Studies.

energy and environmental futures. The proposed undergraduate Minor will provide an educational grounding to address these multidimensional problems.

Learning Outcomes

The proposed undergraduate Minor in ENEP has six intended learning outcomes:

- Students will have the ability to apply major concepts, theoretical principles to the solution of problems (GE Goal #2 ,4 and 5 Critical Thinking, Social Responsibility, Interdisciplinary)
- Students will have the ability to implement interdisciplinary analyses to evaluate the social, technological and ethical issues (GE Goals #2, #5, #10 Critical Thinking, Interdisciplinary, and International).
- Students will know local, national and international energy and environmental policy and governance systems to effectively work in the field (GE Goal #9, #10 Diversity, International).
- Students will have the ability to present written and oral reports of technical information clearly and concisely (GE Goal #1 Oral and Written Communication).
- Students will have an appreciation of the importance and practice of professional ethics and standards in the field (GE Goal #4 Ethics).
- Students will have the ability to use computers for policy computations, data acquisition and data base searching (GE Goal #1 Information Literacy, Information Technology)

II. RATIONALE AND DEMAND

A. Institutional Factors

1. *Explain how the proposed program is compatible with the Academic Priorities of the University.*

In *Path to Prominence: Strategic Plan for the University of Delaware* (2008), the University identifies an “Initiative for the Planet” as one of its strategic milestones for excellence. The Initiative’s goal is to make “the University of Delaware a national and international resource for environmental research, technology, education, and policy.” The Strategic Plan specifically calls for building and expanding upon the University’s highly regarded research and education programs

in energy technology, economics *and policy*. Affirming the University's commitment to promoting energy and environmental sustainability, President Harker states that in these "challenging times for the entire planet ... this University must be an active and dynamic force in addressing these global issues." UD has committed itself to promote sustainability in education and engagement, and has identified as part of its core work in this area to offer "sustainability-related coursework in engineering, history, geography, wildlife ecology, marine studies and many other areas, providing a high-quality learning environment in undergraduate, graduate and professional programs" (<http://www.udel.edu/sustainability>).

The University has the distinction of having created the first cross-disciplinary Ph.D. in Energy and Environmental Policy and Master of Energy and Environmental Policy (MEEP) in the United States. After ten years of graduate enrollment, the program has earned national and international recognition for its innovative approach. In 2009, the Bachelor of Science in Energy and Environmental Policy was approved and enrolled its first students in the fall semester of 2010. The proposed undergraduate Minor in Energy and Environmental Policy (ENEP) builds upon the success of these graduate and undergraduate educational programs to provide students in other Majors access to an organized program of study in energy and environmental policy.

The undergraduate Minor aligns with the academic priorities of the University's stated goals to promote programs which engage in inter-disciplinary efforts to create integrated and critically reflective solutions to the world's pressing energy and environmental challenges. The program is designed to provide students with core knowledge of the energy sector and its environmental impacts and to foster graduates who will be instrumental in developing long-term effective and sustainable solutions. Building upon the excellence of existing faculty in the Center for Energy and Environmental Policy, this Minor offers a program of courses in energy and environmental policy.

2. Describe the planning process which resulted in the development and submission of this proposal.

Planning for the undergraduate Minor in Energy and Environmental Policy was developed by the Center for Energy and Environmental Policy. The minor builds upon the undergraduate major developed in 2009 in collaboration with faculty from the Colleges of Agriculture & Natural Resources, Arts & Science, Business & Economics, Engineering, Human Services & Public Policy, and Marine & Earth

Studies. For the major planning, a Steering Committee composed of 20 faculty and research staff met over a five-month period to develop the structure of the Minor with three concentrations.. The Steering Committee reviewed and adopted the final proposed undergraduate Major in Energy and Environmental Policy by consensus and also agreed to develop a subsequent proposal for an undergraduate minor.

Since 1980, the Center for Energy and Environmental Policy has supported research and education in this field. It has created a partner network of more than 25 universities and research institutes. The Center will provide an important source of intellectual and professional support to the new Minor.

3. Describe any significant impact the proposed curricula might have on other instructional, research, or service programs of the university.

The proposed undergraduate Minor in Energy and Environmental Policy will complement programs being offered at the University. The proposed Minor is designed to educate and build core competencies and skills for prospective practitioners who will work at the intersections of business, technology, government, research and civil society sectors seeking to improve energy and environmental policy. The courses are offered by faculty in the Center for Energy and Environmental Policy. With its inter-disciplinary approach, the minor will enhance student participation in departmental and University-wide knowledge structures. It is specifically designed to serve the needs and complement an array of other programs including Environmental Studies, Public Policy, International Relations, and Engineering to name a few. The Minor will not have an adverse impact on existing instructional, research or service program resources of the University. Rather it is designed to support better use of existing resources.

4. Describe how the proposed curricula would more fully utilize existing resources.

The undergraduate Minor in Energy and Environmental Policy draws from existing classes already offered by the Center for Energy and Environmental Policy for the Major in Energy and Environmental Policy. These ENEP courses are ENEP 250, ENEP 402, ENEP 410, ENEP 424, ENEP 425, ENEP 426, and ENEP 470. In this manner, the minor utilizes existing resources and classes to provide interdisciplinary learning opportunities.

B. Student Demand

Rising interest in educational programs in Energy and Environmental Policy coincides with societal awareness of the current and future challenges to environmental sustainability, and the centrality of energy systems and policy in addressing these challenges. Given the experience and popularity of the existing undergraduate and graduate programs at the University and the rising interest on campus in this field (this fall, 20 undergraduate students are taking undergraduate ENEP courses) we estimate 10 to 15 new minors per year.

A recent telephone survey of university programs with national reputations in the field indicates that undergraduate majors, minors and certificates, while new (nearly all survey respondents indicated their programs are less than 5 years old), are attracting students in the range expected for the proposed ENEP Minor at Delaware. Duke University reports that its Energy and Environmental Policy undergraduate certificate is annually admitting 15 students. The Energy and Resources major at the University of California, Berkeley is attracting 10-15 new undergraduate students each year and a minor is being developed. Student interest in this field is most certainly growing.

Currently, the Master's and Doctoral programs in Energy and Environmental Policy administered by the Center for Energy and Environmental Policy receive over 140 applications and detailed inquiries per year. The programs accept 14 to 16 students each year. About 60% of applicants have academic backgrounds in the social sciences (including economics, geography, policy studies and environmental studies), and 40% received their prior degrees in science or engineering. Recently, an Academic Program Review conducted by an internationally reputed panel of scholars ranked the CEEP administered Master's and Doctoral degrees among the top three internationally. In addition in its first year of implementation the Undergraduate Major has received 30 number of applications and is expected to exceed initial expectations on student demand.

The proposed Minor requires students to take five ENEP courses, which are taught by Center for Energy and Environmental Policy program faculty. In addition to the enrolled Minors, these courses can be used as service courses for other appropriate programs in the University. Courses in the Minor may also be used in fulfillment of breadth requirements in:

Group C: Empirically based study of human beings and their environment;
Group D: The study of natural phenomena through experiment and analysis.

C. Transferability

The proposed undergraduate Minor would be open to all transfer students who meet admission requirements and/or who are in good academic standing with a minimum GPA of 2.0. It is proposed that students already admitted to the University of Delaware and who are matriculated in other programs should have a minimum GPA of 2.0 in order to apply for the Energy and Environmental Policy Minor. Transferring students who elect this Minor before completion of their fifth semester of full-time study should be able to complete the Minor in four years, however, those who wish to transfer after the fifth semester of full-time study may still be able to complete the minor.

Approximately 15-20 students are expected to enroll in the initial years.

D. Access to Graduate and Professional Programs

Students can utilize the proposed Minor to supplement their undergraduate program in preparation for graduate study. This includes cross-disciplinary fields such as sustainability studies, international relations, public policy, urban planning, and engineering. The proposed undergraduate Minor will provide a solid academic grounding for success in graduate school and/or in their professional careers.

E. Demand and Employment Factors

The proposed Environmental and Energy Policy Minor will help to support a range of careers in the field of energy and the environment. This includes employment in planning, policy analysis, and management and administration in local and national governments, international agencies, non-profit organizations, consulting firms, energy utilities and companies, and corporate departments with responsibilities for energy and environmental matters.

A review of labor market trends shows that energy and environmental careers will be a major source of new jobs in the next decade. The importance of the energy sector for ecosystems, public health systems, urban and land use planning, rural development and agriculture, the global and domestic economies, and international governance is leading to the demand for a growing pool of educated individuals for government and industry. According to a recently released United Nations report (September 2008), investment in emerging energy and environmental technologies will increase from \$1.3 billion in 2008 to \$2.74 billion by 2020. Shifting to so-called 'green' economies will require private and public investment strategies as

well as policy frameworks to effectively and efficiently guide this transition. In addition to the public sector, over 2,000 energy and environmental non-profit organizations in the U.S. also offer an important source of employment potential for University graduates with courses in the proposed Minor.

F. Regional, State and National Factors

Currently there are no university programs in the state or region providing an undergraduate Minor utilizing a cross-disciplinary approach to address the need to build a sustainable energy and environmental future. The uniqueness of the proposed Minor is that it combines the rigor and content knowledge of an interdisciplinary framework to educate and prepare students to be effective decision makers and problem solvers in the energy and environmental sectors.

The need for new educational approaches to address the formidable societal challenges in transitioning to a sustainable future is receiving national and international attention. There are calls at every governmental scale, from local to national to international, for programs that prepare students to understand the complex interactions between the energy and environmental sectors. (See, for example, *Final Report of the International Commission on Education for Sustainable Development Practice*, MacArthur Foundation, October 2008).

The surge of policy and legislation aimed at redesigning energy technology and energy economics to minimize environmental impacts is expected to continue. In the State of Delaware, as in most states across the country, development and implementation of policies that address climate change and other environmental issues, energy sector price and cost volatility, energy technology development, and social equity concerns are high policy priorities. Implementation of state-level Climate Action Plans and associated state energy programs that meet state level targets for carbon emission reductions will require practitioners with such knowledge and background. The proposed undergraduate Minor prepares students to have specialized knowledge within their program to address these issues.

G. Describe Other Strengths

Scholarship, research and education must cross traditional disciplinary and institutional boundaries if local, national and global energy and environmental problems are to be effectively addressed. The proposed Environmental and Energy Policy undergraduate Minor advances a novel and needed model of study in this dynamic and rapidly expanding policy field.

Energy and environmental planning and policy requires cross-disciplinary knowledge that combines a level of technical understanding of society-nature interactions with a clear sense of the policy arena's strengths and limits. In this case, cross-disciplinary means more than mixing disciplinary perspectives or seeking synergistic insights. Energy and environmental problems require an understanding and knowledge that bridges the diversity of disciplines while testing that understanding in complex, real world contexts.

The proposed undergraduate Minor was designed to create the conditions for students to obtain an analytic understanding of the field and its problems. The University's Center for Energy and Environmental Policy has supported research and education in the field since 1980. Its internationally recognized expertise, well-established research programs, extensive partner network with other universities and research institutes. Faculty assuming key roles in the Minor (see in Section V. "Faculty/Administrative Resources" for a list) will hold appointments in CEEP, thereby enhancing the networks which students can utilize to explore their interests. This appointment policy has worked very effectively for the graduate programs administered by CEEP.

III. ENROLLMENT, ADMISSION AND FINANCIAL AID

A. Enrollment

Students must be in good academic standing and have a cumulative GPA of 2.0 to enroll in the Minor. Additionally, it is proposed that enrolled Minors must maintain a 2.0 GPA in all Minor courses in order to graduate. If a course is repeated, both the original and the subsequent grades for repeated courses contribute to the cumulative grade point index. Credit from courses taken on a pass/fail basis cannot be used to complete any Minor degree requirements.

B. Admission Requirements

There are no unique admission requirements for the proposed Minor.

C. Student Expenses and Financial Aid

There will be no additional expenses and institutional financial support will not normally be provided to undergraduate Minors.

IV. CURRICULUM SPECIFICS

A. Institutional Factors

The Minor will be conferred. Students who complete the proposed minor requirements will receive inter-disciplinary general knowledge in the field of energy and environmental policy.

B. Describe the Curriculum

The proposed minor requires 15 credits to graduate. It includes seven courses offered by the Center for Energy and Environmental Policy.

ENEP 250 Introduction to Energy Policy 3 credits

This course introduces the field of energy policy and provides a substantive review of energy technology, resources and policies and the role of social, economic, political, and environmental factors in shaping the energy sector. It surveys policy, technical and economic assessments of key energy options needed to achieve a more sustainable world, and the appropriate policy mechanisms to implement these options.

ENEP 402 Electricity Policy and Planning 3 credits

This course analyzes technological and regulatory policy evolution of electricity industry. Considers how technology innovations and policy regulatory actions have guided industry planning from its early days.

ENEP 410 Political Economy of the Environment 3 credits

Reviews major theories developed over last half century to explain nature and society relationships. Policy case studies of environmental justice, trade and environment, global climate change, and sustainable development are used to evaluate current range of political-economic explanations of nature-society relationships. International, national and local responses to these problems analyzed

ENEP 424 Sustainable Energy Policy and Planning 3 credits

This course analyzes sustainable energy strategies in terms of their technology, economics, impacts on the environment and governance attributes. Policy options to facilitate a sustainable energy future are assessed.

ENEP 425 Energy Policy and Administration**3 credits**

This course prepares students to analyze at an advanced level the policies associated with different energy resources, technologies and uses. It teaches techniques to evaluate the role of social, economic, political, and environmental factors in energy policy choice. The course focuses on interrelationships among energy, environment, economy and equity considerations. It considers the energy policy options needed to achieve a more sustainable world.

ENEP 426: Climate Change: Science, Policies & Political Economy**3 credits**

The course examines existing policy responses to climate change, alongside opportunities for a redirected political economy to achieve energy and environmental conditions with meaningful CO₂ reductions. Specific attention is given to possibilities and limits of scientific knowledge and technology in galvanizing social change.

ENEP 470: Readings: Energy and Environmental Policy**3 credits**

This course is a tutorial one and students are able to take it in Winter Session or Summer Session in addition to regular semesters (Spring and Fall).

V. RESOURCES AVAILABLE**A. Learning Resources**

Existing University library holdings, audio-visual materials, special equipment and collections will adequately support the proposed undergraduate major. The learning resource infrastructure for the graduate programs in energy and environmental policy are already in place. The University of Delaware library already has a significant collection of well over 100 electronic journals and internet resources. Additionally, a search on DELCAT of energy and environmental policy yields nearly 10,000 related volumes in the library holdings. Further, the extensive network, expertise, and resources developed across the ENEP graduate program and CEEP provide a rich array of learning resources and opportunities for undergraduate students. No additional learning resources are required to support the educational needs of students in the minor.

B. Faculty/Administrative Resources

1. Faculty

The proposed minor program, like the major shall initially be governed by the undergraduate program faculty. These 20 faculty hold appointments in CEEP, and the Center will be responsible for providing salaried staff support for the program. These 20 faculty (hereinafter referred to as the Program Faculty) will be responsible for activities and obligations customarily assigned by the University to departmental faculty.

The Director of the Undergraduate ENEP Program will be appointed by the Dean of the College of Engineering for a three year renewable term with the advice of the Program Faculty. The Director will be a member of the Program Faculty and will be responsible for general management of the Program. Appointment of faculty members to committees will take into consideration the full range of disciplines and interests of the Program Faculty.

Additional faculty can be added to the Program Faculty by a favorable vote of three-fourths of the full Program Faculty. This governance approach parallels the one in place for the University graduate programs in energy and environmental policy and has proved, after 10 years of operations, to effectively serve the interests of the students, the faculty and the University.

2. Administration

Administrative responsibility for the proposed minor shall reside with the Office of the Dean of the College of Engineering. The Center for Energy and Environmental Policy shall be responsible for day-to-day administration of the proposed minor under the direction of the Dean. This administrative approach parallels the one in place for the current undergraduate major and graduate programs and has proved, after 10 years of operations, to effectively serve the interests of the students, the faculty and the University.

C. External Funding

No new external funding is necessary to launch the minor.

VI. RESOURCES REQUIRED

A. Learning Resources

No additional learning resources will be required for the proposed minor.

B. Personnel Resources

No new faculty or staff positions will be required to implement the proposed minor.

C. Budgetary Needs

VII. IMPLEMENTATION AND EVALUATION

A. Implementation Plan

The ENEP Minor can be implemented upon approval. Because the minor is comprised of existing classes, new course development will not be required.

B. Assessment Plan

Assessment of the program will follow University guidelines and regulations. The Director of the Program and the Program Faculty will be responsible for assessment of courses in consultation with, and under advisement from, the University Office of Assessment. This will follow the schedule developed for an assessment of the undergraduate major. Learning outcomes were developed through the proposed major planning process and the learning assessment conducted by program faculty in 2010. Minor Learning Outcomes and their alignment with UD learning goals are as follows:

1. Students will have the ability to apply major concepts, theoretical principles to the solution of problems (Undergraduate Goals #2 ,4 and 5 Critical Thinking, Social Responsibility, Interdisciplinary)
2. Students will have the ability to implement interdisciplinary analyses to evaluate the social, technological and ethical issues (Undergraduate Goals #2, #5, #10 Critical Thinking, Interdisciplinary).

3. Students will know local, national and international energy and environmental policy and governance systems to effectively work in the field (Undergraduate Goals #9, #10 Diversity, International).
4. Students will have the ability to present written and oral reports of technical information clearly and concisely (Undergraduate Goal #1 Oral and Written Communication).
5. Students will have an appreciation of the importance and practice of professional ethics and standards in the field (Undergraduate Goal #4 Ethics)
6. Students will have the ability to use computers for policy computations, data acquisition and data base searching (Undergraduate Goal #1 Information Literacy, Information Technology)

Core Courses	LO1	LO2	LO3	LO4	LO5	LO6
ENEP 250	X	X	X			X
ENEP 402		X			X	X
ENEP 410	X	X		X		
ENEP 424		X	X	X		X
ENEP 425		X		X		X
ENEP 426	X	X	X			X