ARIZONA STATE UNIVERSITY

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GENERAL STUDIES PROGRAM COURSE PROPOSAL COVER FORM

Courses submitted to the GSC between 2/1 and 4/30 if approved, will be effective the following Spring.

Courses submitted between 5/1 and 1/31 if approved, will be effective the following Fall.

(SUBMISSION VIA ADOBE.PDF FILES IS PREFERRED)

DATE  January 9, 2012

1. ACADEMIC UNIT:  School of Sustainability

2. COURSE PROPOSED:

   SOS  194  The Thread of Energy  3
   (prefix) (number) (title) (semester hours)

3. CONTACT PERSON:

   Name: Susan Ledlow  Phone: 5-8645
   Mail Code: 5502  E-Mail: ledlow@asu.edu

4. ELIGIBILITY: New courses must be approved by the Tempe Campus Curriculum Subcommittee and must have a regular course number. For the rules governing approval of omnibus courses, contact the General Studies Program Office at 965-0739.

5. AREA(S) PROPOSED COURSE WILL SERVE. A single course may be proposed for more than one core or awareness area. A course may satisfy a core area requirement and more than one awareness area requirements concurrently, but may not satisfy requirements in two core areas simultaneously, even if approved for those areas. With departmental consent, an approved General Studies course may be counted toward both the General Studies requirement and the major program of study. (Please submit one designation per proposal)

   Core Areas
   Literacy and Critical Inquiry–L  ☐
   Mathematical Studies–MA  ☐
   Humanities, Fine Arts and Design–HU ☐
   Social and Behavioral Sciences–SB ☒
   Natural Sciences–SQ ☐

   Awareness Areas
   Global Awareness–G ☐
   Historical Awareness–H ☐
   Cultural Diversity in the United States–C ☐

6. DOCUMENTATION REQUIRED.
   (1) Course Description
   (2) Course Syllabus
   (3) Criteria Checklist for the area
   (4) Table of Contents from the textbook used, if available

7. In the space provided below (or on a separate sheet), please also provide a description of how the course meets the specific criteria in the area for which the course is being proposed.

CROSS-LISTED COURSES: ☐ No  ☒ Yes; Please identify courses:  GCU 194

Is this an multisection course?: ☐ No  ☒ Yes; Is it governed by a common syllabus?  

Sander van der Leeuw
Chair/Director (Print or Type)

Date: 01/09/12

Chair/Director (Signature)

Rev. 1/94, 4/95, 7/98, 4/00, 1/02, 10/08
Description of How SOS/GCU 194 Meets the SB Designation

The Thread of Energy emphasizes the idea that energy sustainability is a social issues with a technical component, rather than the other way around. This course introduces students to the relationship of human societies across the globe to the larger energy system. The course is cross listed as GCU 194 and SOS 194, GCU being the social science prefix for geography courses. The School of Sustainability, as a part of the Global Institute of Sustainability, stresses certain key concepts in all of our courses that are relevant to the SB designation. One of those concepts is understanding that human and natural systems are interlinked, and that an understanding of decisions, behaviors, and institutions is critical to understanding any environmental issue such as energy. A second key concept in all SOS courses is that of collaboration and participation. We emphasize the importance of considering all stakeholder groups in the analysis of environmental issues.

The course description and schedule include key concepts topics such as:
- The role of energy in everyday life
- The geography of energy
- The economics of energy
- Energy and environmental costs
- Energy poverty and inequalities across nations and cultures
- How energy affects international relations
- Behavioral change
- Public perceptions and acceptability

The author of one of the texts we selected for this course, "The Energy Reader" is Laura Nader, an anthropologist at UC Berkeley. The entire book places a strong emphasis on the cultural and social dimensions of energy use. Representative chapters include:

- Dimensions of the "People Problem" in Energy Research and "the" Factual Basis of Dispersed Energy Futures
- The House that Uranium Built: Perspectives on the Effects of Exposure on Individuals and Community
- Energy as it Relates to the Quality and Style of Life
- Replacing Myths with Maxims: Rethinking the Relationship Between Energy and American Society
- The Politics of Energy: Toward a Bottom-Up Approach

The developer and teacher of the class, Dr. Martin Pasqualetti, is a geographer who specializes in energy and society. The readings he has chosen and the assignments he has designed emphasize how energy shapes and is shaped by social and cultural institutions and individual decision-making.
Rationale and Objectives

The importance of the social and behavioral sciences is evident in both the increasing number of scientific inquiries into human behavior and the amount of attention paid to those inquiries. In both private and public sectors people rely on social scientific findings to assess the social consequences of large-scale economic, technological, scientific, and cultural changes.

Social scientists' observations about human behavior and their unique perspectives on human events make an important contribution to civic dialogue. Today, those insights are particularly crucial due to the growing economic and political interdependence among nations.

Courses proposed for General Studies designation in the Social and Behavioral Sciences area must demonstrate emphases on: (1) social scientific theories and principles, (2) the methods used to acquire knowledge about cultural or social events and processes, and (3) the impact of social scientific understanding on the world.
### ASU--[SB] CRITERIA

A SOCIAL AND BEHAVIORAL SCIENCE [SB] course should meet all of the following criteria. If not, a rationale for exclusion should be provided.

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
<th>Identify Documentation Submitted</th>
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<td>Syllabus, Textbook TOC</td>
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<td>Syllabus, Textbook TOC</td>
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</table>

1. Course is designed to advance basic understanding and knowledge about human interaction.

2. Course content emphasizes the study of social behavior such as that found in:
   - ANTHROPOLOGY
   - ECONOMICS
   - CULTURAL GEOGRAPHY
   - HISTORY

3. Course emphasizes:
   a. the distinct knowledge base of the social and behavioral sciences (e.g., sociological anthropological).
   OR
   b. the distinct methods of inquiry of the social and behavioral sciences (e.g., ethnography, historical analysis).

4. Course illustrates use of social and behavioral science perspectives and data.

### THE FOLLOWING TYPES OF COURSES ARE EXCLUDED FROM THE [SB] AREA EVEN THOUGH THEY MIGHT GIVE SOME CONSIDERATION TO SOCIAL AND BEHAVIORAL SCIENCE CONCERNS:

- Courses with primarily fine arts, humanities, literary, or philosophical content.
- Courses with primarily natural or physical science content.
- Courses with predominantly applied orientation for professional skills or training purposes.
- Courses emphasizing primarily oral, quantitative, or written skills.
### Criteria (from checksheet) | How course meets spirit (contextualize specific examples in next column) | Please provide detailed evidence of how course meets criteria (i.e., where in syllabus)
---|---|---
1. advance basic understanding of human interaction | The fundamental theme of the course is that energy sustainability is a social issue with a technological component | Modules 1, 4, 5, 7, 8, 9, and 11 specifically address human behavior, decisions, and institutions. |}

2. emphasizes the study of social behavior as found in geography, anthropology, etc. | The course is presented from an interdisciplinary social science perspective, not just one particular social science. | The social science disciplines represented in the course include geography, anthropology, economics, social psychology, political science, and sociology. |

3. the distinct knowledge base of the social and behavioral sciences and 4. the use of social science perspectives and data | The course addresses common topics studied by social science such as decision-making, quality of life, international relations, policy and governance, economics, social institutions, cultural perspectives etc. | Modules 1, 4, 5, 7, 8, 9, and 11 specifically these topics. |
Instructor Information

Martin J. Pasqualetti, Professor School of Geographical Sciences and Urban Planning  
Senior Sustainability Scientist, Global Institute of Sustainability  
Arizona State University  
Email Address: pasqualetti@asu.edu

Course Description

This course follows the thread of energy through every aspect of our lives. It discusses the social, legal, technical, and policy contexts of all energy resources, including present and unconventional fossil fuels, nuclear power, and renewable resources. It addresses energy use throughout history, the influence of energy on quality of life, the role it plays in political strategies and environmental quality, how it shapes our neighborhoods and cities, its contribution to our personal comfort and national security, and how its importance is reflected in the worlds of business and the humanities. The course emphasizes energy as a global concern throughout all topics. The course is designed to have a dual role both as a stand-alone introduction, and as a first step to more advanced studies in the natural, technical, and social sciences.

Course Outcomes and Key Concepts

This course is appropriate for all freshmen students enrolled at ASU. It is meant to serve as an introductory exposure to energy which can serve as a foundation for more focused classes in energy issues within several colleges such as the School of Sustainability, engineering, geography, business and law. The course is unique in that a holistic view of the various aspects of energy will be covered by invited speakers with diverse skills and teaching and research backgrounds. Emphasis will be placed on providing a systems-thinking competence rather than any one specialized aspect of energy.

This course, as all courses in the School of Sustainability do, emphasizes the following themes:

<table>
<thead>
<tr>
<th><strong>Systems Dynamics</strong></th>
<th>Social systems and environmental systems are linked. Changes in any part of any system have multiple consequences or cascading effects that reach far beyond the initial change. While some of the consequences of the decisions that we make are intended, unintended consequences, both positive and negative, are common.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scale</strong></td>
<td>Sustainability problems exist across multiple spatial scales. Solving a problem at a local level is a very different thing than solving a problem across international boundaries. Local activities might have impacts on other regions and even on the global scale.</td>
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<tr>
<td><strong>Long Term Development</strong></td>
<td>Sustainability hinges on an understanding of long-term consequences of the decisions that we make today. Solutions that work in the short term may pose problems over a longer time frame. Challenges that seem small in the present may magnify over time.</td>
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<tr>
<td><strong>Tradeoffs</strong></td>
<td>There is no one “solution” to address sustainability. Solving almost all problems related to sustainability involves tradeoffs involving the socio-economic needs of multiple stakeholder groups and environmental capacities. There are rarely perfect solutions with no costs, and there are often winners and losers.</td>
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<tr>
<td><strong>Collaboration and Participation</strong></td>
<td>Sustainability problems are caused by, and affect, multiple stakeholders with specific experiences, resources, perspectives and preferences. Solving sustainability problems requires strong collaborations and negotiations among scientists of all disciplines, politicians, entrepreneurs, artists, farmers, business and community leaders, and you.</td>
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</tbody>
</table>
Within the context of these themes, this class is designed to provide students basic understanding and appreciation of the following energy topics:

- Key role of energy in modern-day global society (present consumption patterns and future needs)
- Energy resources: fossil-based and renewable
- Basic science of different types of energy and energy conversion systems
- The importance of energy conservation
- The social aspect of energy use within and across cultures and nations
- The effect of geographic/spatial equilibrium
- Impact of energy on the environment and the atmosphere
- Energy research process
- The nexus between energy and national security
- The present and future of the energy business
- Legal and policy issues surrounding the future of energy

Specific learning outcomes for each module in the course may be found on the course website

**Assigned Textbook**


Gilbert Manners, *Energy for Sustainability*, Island Press

**Course Website**

- This course has an accompanying myASU website. Log in to the site at http://myasucourses.asu.edu/ using your ASURITE ID and password. You should see “GCU/SOS 194: The Thread of Energy. The website contains the slides of lectures, reading materials for each topic, assignments, solutions, links, and email addresses for all in the class.

- **Note:** myASU uses your email address from ASU’s student records. This means that the students will have to check their ASU email, or have it forwarded to their preferred account, to get information sent from instructors or from their classmates.

**Instructional Methods**

Instruction will rely on mini-lectures, in-class exercises, guest speakers, assigned self-study, videos, and discussion of case studies. Written assignments, weekly journals and summary of guest speakers oral presentations will enhance understanding and provide a proper appreciation of various facets of energy issues.

**Grading Policy**

ASU’s +/- grading will be used: A (93-100%), A- (90-92), B+ (87-89), B (83-86), B- (80-82), C+ (77-79), C (70-76), D (60-69), E (<60), XE (failure due to academic dishonesty).
The final grade will be assigned on the basis of the following categories and according to the indicated weights:

- Weekly journals: 20%
- Assignments: 40%
- Quiz-1: 20%
- Quiz-2: 20%
- Total: 100%

**Pre-requisites**

There are no prerequisites for this course.

**SCHEDULE**

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<th>Meeting</th>
<th>Topics</th>
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<tbody>
<tr>
<td><strong>Module 1</strong></td>
<td><strong>The Thread of Energy</strong> (the importance of energy everything we do)</td>
</tr>
<tr>
<td>1.</td>
<td><strong>Energy in Your Lives</strong> (how energy is used in homes, cars, and so forth; with; ASU examples)</td>
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<td>2.</td>
<td><strong>Energy and Transitions</strong> (including past and future, plus the motivations for transitions)</td>
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<td><strong>Module 2</strong></td>
<td><strong>Energy Basics</strong></td>
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<td>3.</td>
<td>The physics and chemistry of energy</td>
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<td>4.</td>
<td>The energy fuel chain</td>
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<td>5.</td>
<td>Generating electricity</td>
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<td><strong>Module 3</strong></td>
<td><strong>Energy Resources</strong></td>
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<td>6.</td>
<td>Fossil</td>
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<td>7.</td>
<td>Nuclear</td>
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<td>8.</td>
<td>Renewables</td>
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<td>9.</td>
<td>Efficiency</td>
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<td><strong>Module 4</strong></td>
<td><strong>Energy in the Global Arena</strong> - Why energy geography matters; Spatial disequilibrium of supply and demand; World energy at a glance</td>
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<td>10.</td>
<td>Supply</td>
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<td>11.</td>
<td>Demand</td>
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<td>12.</td>
<td>Transportation</td>
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<td><strong>Module 5</strong></td>
<td><strong>Energy in the Built Environment</strong> (How it is integrated into where we live, how we live, and how we can improve)</td>
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<td>13.</td>
<td>Architecture and engineering</td>
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<td>14.</td>
<td>Transportation</td>
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<td>15.</td>
<td>Planning</td>
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<td><strong>Module 6</strong></td>
<td><strong>Energy in the Natural Environment</strong></td>
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<td>16.</td>
<td>Air – from visibility to climate change</td>
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<td>Land – evolving energy landscapes of energy</td>
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<td>18.</td>
<td>Water – chemical, thermal and physical changes</td>
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<td><strong>Module 7</strong></td>
<td><strong>Energy and Society</strong></td>
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<td>19.</td>
<td>Health and safety</td>
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<td>20.</td>
<td>Energy poverty</td>
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<td>21.</td>
<td>Energy security - Energy security as a nexus of policy decisions. Levels of security (e.g. personal to global, along with case studies); Costs of security (e.g. lifestyles, military presence)</td>
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<td>22.</td>
<td>Decision making – Why people make the choices they do</td>
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<td><strong>Module 8</strong></td>
<td><strong>Energy in Business</strong></td>
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<td>23.</td>
<td>Energy Economics</td>
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<td>24.</td>
<td>Energy Workforce</td>
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<td><strong>Module 9</strong></td>
<td><strong>Energy in Practice</strong></td>
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<td>25.</td>
<td>Energy Law - brief overview of the legal architecture for the regulation of production, distribution and use of energy in the United States; followed by discussion of legal tools for promoting sustainable energy including direct subsidization, tax credits, renewable energy portfolio requirements, climate change and environmental regulation, feed-in tariffs and others.</td>
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<td>26.</td>
<td>Energy Policy</td>
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<td><strong>Module 10</strong></td>
<td><strong>Energy in the Arts</strong></td>
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<td>Aural and visual</td>
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<td><strong>Module 11</strong></td>
<td><strong>Energy Sustainability</strong></td>
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<tr>
<td>28.</td>
<td>The future of energy</td>
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</table>

**Course Communication**

During the work week (M-F, 8am-5pm) I will try to respond to e-mails received within 12-24 hours, if not sooner. I do not check e-mail frequently during the weekend, so if you send a message to me after 5pm on Friday afternoon, do not expect a response until Monday. If you do not receive a response from me within 48 hours, please re-send your message as it may not have found its way to my inbox.

All communications (electronic and otherwise) that you have with me and your fellow students in this course should be professional. This means using proper grammar and sentence structure in your communication. Finally, always make sure that your inbox is not full and that your ASU email address (or forwarding account) is functioning properly, as I often distribute course communication through Blackboard’s announcements and email system, which utilizes your ASU email address.
Academic Integrity

Cheating and plagiarism is not tolerated. This includes, but is not limited to using the ideas and material of others without giving due credit, and/or aiding another person to cheat either actively or passively (e.g., allowing someone to look at your exam/quizzes; writing someone’s paper for them). If a student is charged with academic dishonesty and found to be in violation, disciplinary action will be taken and a student’s name will be kept on file. Disciplinary action may result in the student receiving an XE on her or his transcript, suspension or expulsion from the academic unit and/or referral to Student Judicial Affairs. For further information, please read the Student Code of Conduct.

Disability Accommodations

If you need disability accommodations for this class, please contact the instructor as soon as possible, so that we may work with the Disability Resource Center (http://www.asu.edu/studentaffairs/ed/drc/) to meet your needs. Information regarding disability is confidential.

Sustaining Yourself

There are a number of offices on and off campus that help students succeed at ASU. Please take advantage of these services as needed.

- **Computer Help Desk** provides assistance with computer-related problems and computer accounts. [https://help.asu.edu](https://help.asu.edu)
- **Counseling and Consultation** provides confidential mental health and career counseling services for all ASU students. [http://students.asu.edu/counseling](http://students.asu.edu/counseling)
- **Disability Resources Center** provides a comprehensive range of academic support services and accommodations for qualified students with disabilities. [http://www.asu.edu/studentaffairs/ed/drc](http://www.asu.edu/studentaffairs/ed/drc)
- **Student Financial Aid Office** offers information and applications for student funding such as grants, loans, scholarships and student employment. [http://students.asu.edu/node/40](http://students.asu.edu/node/40)
- **Campus Health Service** provides non-emergency medical health care to all ASU students. All insurance plans are accepted. [http://students.asu.edu/health](http://students.asu.edu/health)
- **Student Recreational Center** offers individual and group fitness opportunities, as well as information on nutrition and wellness, and massages. Use of the general facilities (weights, circuit training and cardio machines) are free, other services (yoga classes, massages) are fee-based. [http://src.asu.edu](http://src.asu.edu)
- **Student Legal Assistance** provides legal advice and counsel free of charge to all ASU students in areas such as landlord-tenant law, credit reports and collection issues, taxability of scholarships and grants, etc. Notary service is also available at no charge. [http://www.asu.edu/studentaffairs/mu/legal](http://www.asu.edu/studentaffairs/mu/legal)
- **Writing Center** provides on-site tutors to help students increase their confidence as writers and improve writing skills free of charge. For information, see [http://studentsuccess.asu.edu/writing/](http://studentsuccess.asu.edu/writing/)
- **EMPACT Crisis Hotline** offers free 24-hour support for mental health crises. Call (480) 784-1500 in the Phoenix area, (866) 205-5229 for the toll-free number outside of Phoenix, and (480) 736-4949 for the sexual assault hotline in Maricopa County. All services are free and confidential. [www.empact-spc.com](http://www.empact-spc.com)
SOS 194: The Thread of Energy
Case Analysis Format

1. Background: (a one-page description of the problem or challenge). Include:
   a. Global, regional and local scale.
   b. Temporal scale

2. Stakeholders (community and cultural groups, government agencies, NGO’s, businesses, etc))
   a. Who is affected by this issue?
   b. How are they affected?

3. Social Issues, e.g., Fair pay, working conditions, poverty, justice

4. Economic Issues, e.g., ecosystem valuation, trade, long vs. short term profits

5. Environmental Issues, e.g., resource and energy conservation, habitat and biodiversity, water, pollution, climate change

6. Potential Solutions. Include:
   a. Tradeoffs involved in each possible resolution
   b. Winners, and losers for each possible resolution-globally and locally
Textbook #1 for GCU/SOS 194


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3. Energy Transitions in Historical Perspective (Martin Melosi).

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4. Introduction to the Steady-State Economy (Herman E. Daly).


5. Dimensions of the "People Problem" in Energy Research and "the" Factual Basis of Dispersed Energy Futures (Laura Nader and Norman Milleron).


7. The House that Uranium Built: Perspectives on the Effects of Exposure on Individuals and Community (Margaret Amalia Hiesinger).

8. Uranium Mining and Milling: Navajo Experiences in the American Southwest (Barbara Rose Johnston, Susan E. Dawson, and Gary E. Madsen).

Part II: Mind-sets – a Critical Perspective.


10. On the Road to Riches (Henry Ford).


14. Energy as it Relates to the Quality and Style of Life (Laura Nader and Stephen Beckerman).


17. The Middle East: Geostrategy and Oil (Rashid Khalidi).
18. Winning the Oil Endgame (Amory B. Lovins).
20. The Overcharge in the Light Bill (US Senator Lee Metcalf and Vic Reinemer).

Part IV: Energy Choices.

24. There Was Blood (Caleb Crain).
Energy in Action 7: Capitol Climate Action: Mass Civil Disobedience in DC Against Use of Coal at Capitol Hill Power Plant.
25. Unconventional Crude: Canada's Synthetic-Fuels Boom (Elizabeth Kolbert).
Energy in Action 8: Poop Powers California Cars as Orange County Converts Sewage (Alan Ohnsman).
Energy in Action 9: Power Q&A: S. David Freeman (Dave Gilson).
27. Solar Possibilities (Denis Hayes).
Energy in Action 10: Workers Retrain for Wind-Energy Jobs (Maria Dickerson).
Energy in Action 12: Biofuels Do Far More Harm Than Good (George Monbiot).

Part V: Power Shifts.

30. Natural Capitalism (Paul Hawken).

31. An Unstable Concoction of Interests (Tadeusz W. Patzek).


32. Ticket to Ride (Ben Adler).

Energy in Action 15: Get on the Bus (Laura C. Dean).

33. Selling the Sun (Michael Behar).

Energy in Action 16: Eight Energy Suggestions for Obama, from SunEdison’s Founder (Kate Galbraith).

34. The Island in the Wind (Elizabeth Kolbert).


Part VI: Energy Choices in a Democratic Society.

35. The Harder Path – Shifting Gears (Laura Nader).

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ENERGY FOR SUSTAINABILITY
Technology, Planning, Policy

John Randolph
Virginia Tech

Gilbert M. Masters
Stanford University

ISLANDPRESS
Washington • Covelo • London
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