

# **Sabbatical Proposal 2012-2013**

**Lori Clark**

**Prof. Environmental Science**

## **Background:**

I have been teaching Environmental Science at Moorpark College for 6 years and have helped develop four different education pathways including the AA in Environmental Studies, the AS in Environmental Science, the Certificate in Environmental Technology, and the Proficiency Award in Photovoltaics and Solar Technologies. In recent years, we've reintroduced ENSC M-03 (Energy Resources and Conservation) to our regular course offerings and have included it as a required course for all four paths. ENSC M-03 covers energy types, history, and functions from fossil fuels to nuclear to renewable energies. In searching for the best textbook for this course, I spoke with a variety of professors that teach a similar class and found a general frustration that there wasn't a well fitted textbook. I chose the textbook *Energy and the Environment* published by Wiley. It has good foundational chapters but is limited and has not been revised since 2006, with much of the most recent data coming from 2003 making it very outdated. I have found in teaching the course that I spend a lot of time supplementing the textbook and have had a growing desire to create a current, relevant version of the book for students. I have been in contact with the editor and have proposed working on a new edition of the textbook as a co-author with the original authors and they've expressed an interest in working together with me.

## **Proposal:**

Over the course of a one semester sabbatical (Spring 2013 preferred) I would like pursue research and writing opportunities in order to enhance the textbook material for the ENSC M-03 course. The research would involve conference attendance, collection and analysis of data from public sources such as U.S. department of Energy and U.S. Energy Information Administration, networking and interviews, image creation, and literature searches.

The current chapters (1-10) of the book are listed below with some of the preliminary edits and sections I plan to add to the book in parenthesis and italics. All data throughout the book will be updated from 2003 data (nearly 10 years old).

**Ch. 1 Energy Fundamentals, Energy Use in an Industrial Society** (*update data and graphs for energy consumption and production, % use from various sectors, energy consumption per person from 2003 data, upgrade figures and include more relevant figures*)

**Ch.2 The Fossil Fuels** (*update estimates for undiscovered oil and natural gas, include recent findings globally and include changes in U.S. policy for offshore drilling, ANWR update, Alberta Tar Sand access/keystone pipeline, reference Deepwater Horizon Oilspill, update global natural gas and coal reserves, highlight growth of coal in China, include peak oil prices of 2008 and recession. Update OPEC nations and production.*)

### **Ch. 3 Heat Engines**

**Ch. 4 Renewable Energy Sources I: Solar Energy** (*Update U.S. renewable energy consumption, discuss the factors that influence growth of solar in top growing states: irradiance, gov't incentives, cost of power, possibly include new diagram of earth's orbit highlighting the changing angle of the sun relative to the equator throughout the seasons*)

**Ch. 5 Renewable Energy Sources II: Alternatives** (*update U.S. status and plans for offshore wind projects, highlight European offshore wind, include update of largest hydroelectric projects, ex. Three gorges dam and environmental impacts, include ocean current energy systems, update biofuels to include US policies to increase ethanol production and impact on agriculture, highlight hydrogen fuel cell*)

**Ch. 6 The Promise and Problems of Nuclear Energy** (*Include recent accidents in Japan 2007 and 2011 Fukushima Daaichi and a description of level 7 accidents. Introduce the historic Rocketdyne meltdown. Include an update of new nuclear plants announced in the U.S. and the recent status of Yucca Mt. Discuss proposed growth in China and India and the status of phase out countries such as Sweden and Germany. Introduce new variations of nuclear plants.*)

**Ch. 7 Energy Conservation** (*Add LEED and U.S. Green Building Council standards and criteria, update Energy Star program*)

**Ch. 8 Transportation** (*Include new CAFE standards (mpg standards), add the reintroduction of diesel cars in CA, return of a new generation of electric cars and introduction of plug in hybrid models and hydrogen fuel cell cars by major dealerships, discuss the growth of the high speed rail system in China and emerging markets for autos projected growth and fuel consumption*)

**Ch. 9 Air Pollution** (*update summary of air pollution from 2005 to 2012, include updates to smog tests, gas cap and pump designs to reduce VOC*)

**Ch. 10 Global Effects** *(Include information about cap and trade Carbon Dioxide program recently passed in CA, update climate change reports)*

***Proposed New Chapters or Special Sections***

**Ch. 11 Water pollution:** *Discuss contamination from fuel additives of the past- lead, MTBE. Discuss the impact of oil spills highlighting Deepwater Horizon and including a special interview with oil spill specialist. Include the impact of mining and improper nuclear waste disposal to rivers and lakes including Lake karachay in Russia.*

**Ch. 12 or special section Performing an Energy Audit:** *Outline the process for performing an energy audit in the home or office including some of the methods to determine drafts and effectiveness of insulation, searching for inefficient use of energy and how to improve efficiency. Include exercises for students to perform.*

**Ch. 13 or special topics in energy Agriculture, fossil fuels and biofuels:** *Look at the relationships between food prices, food production and demand for fossil fuels and fertilizers. Discuss government programs to promote ethanol production and corn production in America.*

**Resources:**

Data Collection

Annual Energy Review

Intergovernmental Panel on Climate Change

National Oceanic and Atmospheric Association

Oil and Gas Journal

OPEC

Statistical Abstracts of the United States

U.S. Bureau of Transportation Statistics

U.S. Department of Commerce, Bureau of the Census

U.S. Department of Energy

U.S. Energy Information Administration

U.S. EPA, Office of Air Quality Planning and Standards

## Conferences

Nuclear energy Institute Energy Assembly or Nuclear Fuel Cycle Conference

American Solar Energy Society conference or International Renewable Energy Conference

## Interview

Ricki Ott: author and oil spill specialist

## **Outcome:**

Through a semester of research, I plan to complete a revised manuscript of Energy and the Environment for submission to the co-authors and editor. I also plan to have a copy of my work arranged so that it can be used to supplement lectures and text materials for my Environmental Science classes.

## **Conclusion:**

By completing a research project in energy resources and conservation, I plan to bring updated materials to support the Environmental Science degree, certificate, and proficiency award programs at Moorpark College. This will improve instruction on our campus and help the students gain more current understanding of our progress in energy uses. An understanding of energy use and production is vital to understanding environmental, economic, governmental and social changes happening locally and globally. This makes our students better informed citizens in the community.

E-mail correspondence with Stuart Johnson, editor of *Energy and the Environment*

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**From:** Johnson, Stuart - Hoboken [sjohnson@wiley.com]  
**Sent:** Thursday, October 13, 2011 1:32 PM  
**To:** Lori Clark  
**Subject:** RE: Energy and the Environment, a new edition?

Lori

Thank you for your message and, yes, this is something we are open to. Can I ask you to write up a short (1 – 2 page) summary of how you would approach the revision? I want to run this by the authors to get their buy-in. If they are OK, then I would ask you to prepare a more complete revision plan that we would have peer reviewed.

Does this sound reasonable?

Stuart

**From:** Lori Clark [mailto:LoriClark@vcccd.edu]  
**Sent:** Thursday, October 13, 2011 12:01 PM  
**To:** Johnson, Stuart - Hoboken  
**Subject:** Energy and the Environment, a new edition?

Hello Mr. Johnson,

I've been using the textbook "Energy and the Environment" as my course textbook for my class (Energy Resources and Conservation) for the past couple of years and have become very interested in working on a revised edition. I'm a professor of Environmental Science at Moorpark College in CA and have worked on publications through academic and non-profit organizations (Stony Brook University and The Hudson River Foundation). If you and the previous authors would have any interest in updating the textbook, I would be very interested to help co-author the new edition. I will be applying for a sabbatical next year in which I would like to invest my time working toward this goal. Is this something you would entertain?

Thank you for your time,

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Hi Stuart,

I've compiled a brief overview of some of the additions I would introduce to update the Energy and the Environment Book. This includes updates and the addition of special sections or new chapters.

For much of the book, the most recent data reported is from 2003, I would like to update most of this information to current records.

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