

**RENEWABLE ENERGY & OTHER CLEANER
FUELS – ENERGY POLICY TO SAVE THE PLANET, THE
COUNTRY, AND THE ECONOMY**

**Law 270.7
Public Policy Special Topics 290**

**Monday
8 am to 9:50 am
Room 170 Boalt Hall**

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Course Description: Our nation is a profligate energy user and yet we have no coherent national energy policy. We have a massive jobs deficit and have been unable or unwilling to turn clean energy into a job creation engine. This course will develop a national energy policy that respects the states, encourages partnership with the private sector, and tears down the regulatory barriers to renewable energy development. We will explore the emerging field of renewable and alternative energy supplies, and review local, state, and federal laws and policies that promote (and impede) such sources. The course will identify policies that empower everyday people to produce their own renewable power through distributed generation, and will survey the range of emerging clean energy technologies.

Requirements: Students are expected to attend class, complete the required readings each day, and contribute to the classroom discussion.

In addition, each student will participate in a group project leading to a written report and class presentation.

There will be no final exam.

GRADING

Final grades will be determined by the following formula:

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|---|-----|
| 1. Class participation | 25% |
| 2. In-class group presentation | 15% |
| 3. Group written report | 20% |
| 4. Individual chapter in written report | 40% |

Syllabus

Class 1: January 9

Introduction

1. Introduction to Renewable Energy Options and Potential, and Electric Systems

- *Who's Winning the Clean Energy Race? 2010*, The Pew Charitable Trust
Read pp.2-13 (top). http://www.youtube.com/ucberkeley#p/l/xIx4O9-kP_g **11**

- *Prospects for Distributed Electric Generation* (2003) Congressional Budget Office, <http://www.cbo.gov/ftpdoc.cfm?index=4552&type=0> Read only the information in the box starting on the first page of the Introduction. We will get back to distributed generation later. **1**

- Renewable Energy Potential maps from the U.S. Department of Energy:
 - National Resources and Map
http://nationalatlas.gov/articles/people/a_energy.html#one (Read this page to gain an initial understanding of the most prominent renewable energy options in the United States.)
 - New England http://www.eia.doe.gov/emeu/reps/rpmap/rp_new-eng.html
 - California http://www.eia.doe.gov/emeu/reps/rpmap/rp_ca.html
 - Middle Atlantic http://www.eia.doe.gov/emeu/reps/rpmap/rp_mid-atl.html
 - South Central http://www.eia.doe.gov/emeu/reps/rpmap/rp_esc.html
 - Mountain http://www.eia.doe.gov/emeu/reps/rpmap/rp_mountain.html
 - Pacific http://www.eia.doe.gov/emeu/reps/rpmap/rp_pacific.html(Look at each of these maps to be able to answer the following questions:
1. Are all states and regions created equal in terms of opportunities to rely on renewable energy? 2. Which renewable options predominate in which parts of the country?) **7**

- Overview of the Electric Grid (U.S. Department of Energy)
<http://nomoretowers.org/Documents/GridWorks%20Overview%20of%20the%20Electric%20Grid.htm> **3**

- *Renewable Energy Sparks a Probe of a Modern-day Land Rush*, by Louis Shagun, Los Angeles Times, June 1 2009
<http://www.latimes.com/news/local/la-me-solar1-2009jun01,0,6845540.story>
(How do we find the appropriate balance between the need to develop renewable energy projects, and the desire to protect sensitive public lands?) **3**

- *Energy Regulatory Chief Says New Coal, Nuclear Plants May Be Unnecessary*, by Noelle Straub and Peter Behr, NYT April 22, 2009 <http://www.nytimes.com/gwire/2009/04/22/22greenwire-no-need-to-build-new-us-coal-or-nuclear-plants-10630.html?pagewanted=1> (Commissioner Wellinghoff is the Chair of the Federal Energy Regulatory Commission, which regulates wholesale power sales and much of the nation's transmission grid. What are the points of contention related to the Chair's perspective?) **3**
- *Western Grid 2050: Contrasting Futures, Contrasting Fortunes*. Clean Energy Vision Group of the Western Grid Project 2012. Read the Executive Summary. <http://www.cleanenergyvision.org/clean-energy-vision-technical-report/western-2050-executive-summary/> (This is just one of various visions for our energy future. What lies ahead under a Business-as-Usual scenario? What would we have to do to break our reliance on coal-fired power? How feasible is the vision offered in this report?) **5**

Class 2: January 23

Federal, State, and Local Efforts to Promote Renewable Energy

2. **Federal Renewable Energy Programs (1): PURPA, (2): EAct 1992, and EAct 2005, EISA 2007, ARRA 2009** – The basic concepts underlying the economic regulation of energy. In addition, discussion, of three federal acts that form reference points for our national conversation about renewable energy.
 - *FERC v. Mississippi* (1982) 456 U.S. 742 abridged. (What is PURPA? What did PURPA require states to do? What obligation must states create for regulated utilities that affects renewable energy development? On what grounds did Mississippi challenge this law? What did the majority conclude? What concerns did Powell raise in his partial dissent?) **7**
 - *The Energy Policy Act of 1992* (1993) Congressional Research Service Report 93-134 ENR, pp.CRS-33 to CRS-36 (top) and CRS-55 (first paragraph under Subtitle B) (How would you characterize the efforts of Congress to promote renewable energy, as reflected in EAct 1992? Which strategy appears to be the most promising? What others things could Congress have done?) **5**
 - *CRS Report to Congress – Energy Policy Act of 2005 – Summary and Analysis of Enacted Provisions* (2006) <http://www.ncseonline.org/NLE/CRSreports/06Apr/RL33302.pdf>, pp.80-81 “Cogeneration and Small Power Production...” (How did Congress in 2005 alter PURPA's requirement for utilities to purchase power from small renewable energy power producers? Why did the change occur?) pp.12-16

General Provisions (How would you characterize Congress' general approach in 2005 for promoting renewable energy? What other things could Congress have done?) **5**

- *CRS: Energy Independence and Security Act of 2007* (2007) pp.CRS-2, CRS-5&6, and CRS-12 through CRS-14
<http://www.state.vt.us/psb/document/ElectricInitiatives/CRS%20Report.pdf>
(What did Congress do for renewables in 2007? What didn't it do? Why do you think that certain provisions failed?) **6**
- *CRS Report to Congress – Energy Tax Policy: History and Current Issues* (Updated April 18, 2008)
<http://www.cnie.org/NLE/CRSreports/08Feb/RL33578.pdf>, pp.1-8 (How has Federal energy tax policy evolved over time? What does Federal tax policy encourage people to do? How must it change in order to promote optimal renewable energy development?) **8**
- *American Recovery and Reinvestment Act of 2009*, Summary of the Renewable Energy Tax Provision from Greene Radovsky (pp.1-5 [first half of the page]) **5**
- *Preliminary Evaluation of the Impact of the Section 1603 Treasury Grant Program on Renewable Energy Deployment in 2009*, Mark Bolinger, Ryan Wisner, Naïm Darghouth, Lawrence Berkeley Lab 2010
<http://eetd.lbl.gov/EA/EMP/reports/lbnl-3188e.pdf> Read the Executive Summary, pp. i-iv. (What is the initial assessment of the effectiveness of the cash grant program discussed in this paper?) **4**
- *Non-Tax-Related Excerpts From: Energy Provisions in the American Recovery and Reinvestment Act of 2009 (P.L.111-5)* Congressional Research Service March 12, 2009 http://assets.opencrs.com/rpts/R40412_20090312.pdf
Note: Although the above link provides the entire report, you are only asked to read a three-page excerpt which is available on b-Space. (What are the major non-tax provisions in the ARRA to promote renewable energy development?) **3**

Class 3: January 30

- 3. State Programs and Regional: Integrated Resource Planning, Renewable Portfolio Standards, Net Metering and Renewable Energy Credits** – A look at the state laws and federal debate about requiring energy service providers to maintain a specified mix of renewable resources. In addition, an effort to create tradable renewable energy credits raises many strategic choices and some Commerce Clause concerns.

- *Renewable Portfolio Standards in the United States – A Status Report with Data Through 2007* by Ryan Wisser and Galen Barbose (2008)
<http://eetd.lbl.gov/ea/ems/reports/lbnl-154e-revised.pdf>, **Required:** pp.1-10 and 12-13 **Recommended:** everything else through p.31. (What is a Renewable Portfolio Standard? How widespread are these requirements? How do they differ from state-to-state? Where are the most ambitious programs? Is there a relationship between the existence of an RPS requirement and the rate of renewable energy development in a state?) **12**
- *Redefining RECs (Part 2) Untangling Certificates and Emission Markets* by Michael Gillenwater (August 2007)
http://www.princeton.edu/~mgillenw/REC-OffsetPaper-PartII_v2.pdf pp.1-12 (plus 2 lines on p.13) (What are the relationships between voluntary REC markets, RPSs and emission cap-and-trade schemes? How should RECs be defined to best encourage renewable energy investments without conflicting with emission markets?) **12**
- *Renewable Portfolio Standard Quarterly Report CPUC 3rd Quarter 2011*
<http://www.cpuc.ca.gov/NR/rdonlyres/2A2D457A-CD21-46B3-A2D7-757A36CA20B3/0/Q3RPSReporttotheLegislatureFINAL.pdf> pp.2-6 (How successful are California utilities in meeting their RPS targets?) **5**
- *The Solar and Wind Energy Chain in Michigan*, Environmental Law & Policy Center 2011 <http://elpc.org/wp-content/uploads/2011/03/ELPCMichiganSolarandWindReport2011.pdf> 1 and 6-13 **9**
- *Wheelabrator Lisbon, Inc. v. Connecticut DPUC* (2006) Slip Copy, 2006 WL 1791688 (D.Conn.) – Abridged version. (Does a utility contract under PURPA to purchase power from a renewable energy provider convey RECs to the utility?) **4**
- *New Mexico Industrial Energy Consumers v. New Mexico Public Regulation Commission* (New Mex Supreme Court 2007), 168 P.3d 105 (abridged) (What aspect of the nature of RECs caused the Court to question the New Mexico commission's rate treatment? Do you agree with the Court's interpretation – is a REC closely akin to purchased power?) **5**
- *Florida Public Service Commission Memorandum re Establishment of Rule on Renewable Portfolio Standard* (December 31, 2008), pp.49-53) **5**
- *What is net metering? Why is it important?*
<http://solar.calfinder.com/blog/solar-information/what-is-net-metering/>
Read this page. **1**
- *Renewable Energy Prices in State-Level Feed-in Tariffs: Federal Law*

Constraints and Possible Solutions, Scott Hempling et al (2010)

<http://www.nrel.gov/docs/fy10osti/47408.pdf> Read pp. iv-ix only. (What is a feed-in tariff? How does it differ from PURPA's qualifying facilities? How does it differ from net metering? Why is it important? What are the potential legal constraints on state-mandated feed-in tariff programs? What are the possible solutions?) **6**

- *Vermont's Corporate Tax Credit for Solar*
http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=VT37F&re=1&ee=1
- *Oklahoma's Zero Emissions Facilities Production Tax Credit*
http://www.dsireusa.org/library/includes/incentivesearch.cfm?Incentive_Code=OK02F&Search=Type&type=Corporate&CurrentPageID=2&EE=0&RE=1
- *Arizona's Residential Solar and Wind Systems Tax Credit*
http://www.dsireusa.org/library/includes/incentivesearch.cfm?Incentive_Code=AZ01F&Search=Type&type=Personal&CurrentPageID=2&EE=0&RE=1
(For each of the above three tax credits: What does the tax credit cover? What gap in the otherwise existing incentive structure might this cover?)

Class 4: February 6

4. The Michigan Experience and Energy Storage

- *One Million Electric Vehicles By 2012*, 2011 U.S. Department of Energy
http://www1.eere.energy.gov/vehiclesandfuels/pdfs/1_million_electric_vehicles_rpt.pdf **9**
- *Growing an American Electric Car Industry, a Tale of Two Companies* by Saqib Rahim, NY Times 2011
<http://www.nytimes.com/cwire/2011/02/02/02climatewire-growing-an-american-electric-car-industry-a-t-5879.html?pagewanted=all> **2**
- *Battery Awardee List* U.S. Department of Energy
http://www1.eere.energy.gov/recovery/pdfs/battery_awardee_list.pdf **5**
- *New Report: Strong Vehicle Standards are Key to U.S. Jobs*, NRDC Blog 2011
http://switchboard.nrdc.org/blogs/tonachel/new_report_strong_vehicle_standards.html **1**
- *Video: Grand Opening of A123 Factory in Michigan*
<http://www.youtube.com/watch?v=beQbdN1QNTc> **2 minutes 32 seconds**

- *Hawaiian Wind Farm Leans on Giant Battery Bank*
http://news.cnet.com/8301-11128_3-57347037-54/hawaii-wind-farm-leans-on-giant-battery-bank/ 1
- *The Power of Energy Storage*, Berkeley Law & UCLA Law, 2010
[http://www.law.berkeley.edu/files/The_Power_of_Energy_Storage_July_2010_Update\(1\).pdf](http://www.law.berkeley.edu/files/The_Power_of_Energy_Storage_July_2010_Update(1).pdf) Read the preface, and the pp. 1-19 21

Class 5: February 13

Field trip.

Class 6: February 27

5. **Local Government Programs: Municipal Utilities, Coops, and Community Aggregators** – The special opportunity that user-owned energy providers have to promote renewable energy, and other local programs to programs to promote renewable energy;
 - *Local Government and Community Programs and Incentives for Renewable Energy* (2001) Susan Gouchoe, North Carolina Solar Center
<http://www.abcsolar.com/pdf/FEDERALREPORT.pdf>. p.7 (except for the last two paragraphs), and pp.10-17. Then choose 2 or 3 specific local governments in the report that are not the subject of other readings for today. Thoroughly read the description of each local government's programs and be prepared to discuss in class. (What are the major categories of actions a local government can take to promote renewable energy? What are some examples of each?) 9
 - *Community Choice Aggregation Pilot Project Appendix G Guidebook* (California Energy Commission 2009)
<http://www.energy.ca.gov/2009publications/CEC-500-2009-003/CEC-500-2009-003.PDF> Read Sections 1.4 through 1.8 (on pp. 2-5), and Sections 2.3-2.4 (on pp. middle of 12 – top of 24). (What is Community Choice Aggregation, and how does it work? What are the most interesting potential benefits and risks? Why might this concept be important for a discussion about renewable energy?) 17
 - Description of San Francisco's Moscone Center Project
http://votesolar.org/wp-content/uploads/2009/12/tools_Moscone_Case_Study.pdf (What is the San Francisco bond program, and how does it work?) 2

- *Chicago Energy Plan* (2001) Scan entire document and read p.12 (What is Chicago's renewable energy procurement commitment?) **1**
- *Solar L.A.*
http://mayor.lacity.org/stellent/groups/electedofficials/@myr_ch_contributor/documents/contributor_web_content/lacity_004982.pdf Read the Executive Summary (pp.1-3) **3**
- *Energy Efficiency and Renewable Energy Financing Districts*, Fuller et al 2009 <http://erg.berkeley.edu/news/2009news/FullerKunkelKammen-MunicipalEnergyFinancing2009.pdf> Read pp.5-9(top) (What is the Berkeley local energy efficiency and renewable energy financing program, which is generically referred to as a Property Assessed Clean Energy program? How would it work, and what are the question marks?) **5**

Class 7: March 5

7. Solar Energy

Distributed Solar – Efforts to promote solar water heating, photovoltaic electric generation, passive solar design. Discussion of light easements, building standards, and house value reassessments.

- *Government Policy and Firm Strategy in the Solar Photovoltaic Industry* (Fall 2011), California Management Review
<http://www.jstor.org/stable/pdfplus/10.1525/cm.2011.54.1.17.pdf> **20**
- *California Solar Initiative (CSI) Annual Program Assessment for 2011*
http://www.cpuc.ca.gov/NR/rdonlyres/9BC1AC3A-020C-4E85-99F0-D6CF42D34B03/0/2011_APA_FINAL_PRINT.pdf pp.6-11 (What is the California Solar Initiative? Who created the program? What are its goals? Is it likely to achieve its goals?) **6**
- *California's Solar Rights Act – A Review of Statutes and Relevant Cases* (2007) Energy Policy Initiative Center
http://www.sandiego.edu/epic/research_reports/documents/100426_SolarRightsAct_FINAL.pdf Limitation on Covenants, Conditions and Restrictions. pp.5-6 (What are the major components of the Solar Rights Act? What are covenants and restrictions? What are solar easements?) **2**
- *California's Solar Shade Control Act* (2010) Energy Policy Initiative Center
http://www.sandiego.edu/epic/research_reports/documents/100329_SSCA_Final_000.pdf pp.3-9 (What is the Solar shade Control Act? Who does it protect? How does it work?) **7**

- *SB 1460 – Pending California Legislation on Solar in Multi-tenant Buildings*
http://info.sen.ca.gov/pub/07-08/bill/sen/sb_1451-1500/sb_1460_bill_20080623_amended_asm_v95.pdf (2 pp.) This bill was not passed into law. (What is the problem being addressed, here? What is the recommended solution? How is it intended that this program affect the greater body of ratepayers? Do you think the process will succeed?) **2**
- *Arizona approves Tucson Electric's community solar program* (July 2010)
http://www.solarindustrymag.com/e107_plugins/content/content.php?content_5932 (What is the approach offered here for addressing the landlord-tenant problem? What are the advantages and disadvantages of this approach?) **1**

Solar Thermal – Review of the various central-station solar technologies, as well as their pluses and minuses.

- *American Energy – The Renewable Path to Energy Security*, Worldwatch Institute and Center for American Progress. One page excerpt on “Desert Solar Power”
http://www.nrel.gov/csp/pdfs/american_energy_pg30_desertsolar.pdf **1**
- *Report on H.R. 2774 – The Solar Energy Research and Advancement Act of 2007* http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=110_cong_reports&docid=f:hr303.110.pdf, Read “Background and Need for the Legislation”, pp.5-7. (What is a concentrating solar project, and what are some of the challenges such a project faces?) **3**

Passive Solar – Consideration of opportunities to incorporate building design features that take advantage of natural, non-mechanical heating and cooling qualities.

- *Passive Solar Building and Design Guidelines and Recognition Program* (2006) City of Santa Barbara Community Development Department
http://www.santabarbaraca.gov/NR/rdonlyres/BFD34004-668E-4238-B7AB-DE8C2F05C648/0/Exhibit_B_Passive_Solar_Guidelines_Recognition_Program.pdf pp.1-7 Review quickly, to become generally familiar with what this covers. (What is passive solar design? What are some of the major design strategies involved? Are the Santa Barbara guidelines mandatory? Could Santa Barbara do things that would be legally binding that would encourage/support the use of these techniques?) **7**

Class 8: March 12

- 8. Wind Power** -- A look at the resources available in the U.S., efforts to mine those resources up until now, siting issues, environmental challenges, transmission needs, and technological advances.
- *U.S. DOE 2010 Wind Technologies Market Report*, June 2011
<http://eetd.lbl.gov/ea/ems/reports/lbnl-4820e.pdf> Read Executive Summary pp. iii-vii (Is wind a cost-competitive energy source? What does the future hold in store for turbine manufacturing and wind development?) **5**
 - *Wind Power: Impacts on Wildlife and Government Responsibilities for Regulating Development and Protecting Wildlife* (2005) U.S. Government Accountability Office <http://www.gao.gov/new.items/d05906.pdf> Read pp.10 (start with first full paragraph)-15 (first two paragraphs), 21-23 (top half) and 34-35 (What are the major wildlife concerns related to windfarms? Are windfarms primarily subject to federal, state, or local jurisdiction for siting purposes? How has development of windfarms differed in the studies states?) **11**
 - *Burch v. Nedpower Mount Storm* 647 S.E.2d 879 (2007) abridged version. (What are the implications of a nuisance suit related to a project approved by a public service commission? How vulnerable are wind projects to private nuisance suits?) **12**
- 9. Waves, Tides, & Ocean Thermal** – The oceans that provide bookends for North America offer almost unlimited supplies of energy related to the movement of water. Many demonstration generating projects are on the way. These resources raise jurisdictional questions and logistical challenges.
- *Alternative Energy and Alternative Use Guide*, U.S. Mineral Management Service Programmatic Environmental Impact Statement
<http://www.ocsenergy.anl.gov/guide/index.cfm> Go to the Alternative Energy tab and click on each of the listed pages (other than the pdfs). (What is the outer continental shelf? How does it affect the use of offshore renewable energy sites? What are the promising ocean-based technologies? Some of them could be built on land, so why use the ocean?)
 - *Comments of the Olympic Coast Alliance on the Proposed Makah Bay Offshore Wave Energy Pilot Project* (2007)
<http://westcoastoseans.gov/docs/070731%20Dyer%20Attachmt%20-%20OCA%20FERC%20Letter.pdf> pp.1-7 (What are the environmental and cultural concerns raised by the Alliance? What can we learn from this example about the challenges in siting these facilities?) **7**

- *Rising Tide and Crosscurrents: Federal Regulation of Ocean Renewable Energy, Trends* – ABA Section Newsletter Vol.39, No.4 (2008), pp.1&10 (What events have occurred since early 2007?) **2**
- *CRS: Wave, Tidal, And In-Stream Energy Projects: Which Federal Agency Has the Lead?* (2008) by Nic Lane. pp.4 (bottom half) – 6. (What is the nature of the jurisdictional dispute between the Mines Management Service and FERC? Where are MMS' major arguments?) **3**
- *Memorandum of Understanding Between the Department of the Interior and the Federal Energy Regulatory Commission* (April 2009) <http://www.ferc.gov/legal/maj-ord-reg/mou/mou-doi.pdf> (How have MMS and FERC agreed to divide responsibility for licensing hydrokinetic projects? Who will oversee preparation of environmental documents? Whose decision about the project has to come first? Does this memorandum clear up any ambiguity about jurisdiction? What problems might arise?) **3**

Class 9: March 19

6. Transmission Challenges -- Central station renewable energy sources, such as wind and thermal, are most promising and easiest to develop in remote places. Ensuring that there is sufficient electric transmission capacity to deliver this power to market and deciding who should pay for the transmission lines are major challenge now facing many state and federal regulators.

- *Senator Reid's Testimony on Behalf of His Bill S.359* http://reid.senate.gov/newsroom/pr_031209_reidtestimonyenergy.cfm This bill was introduced but as yet has not been enacted. (What problem does the bill identify? From reading the author's description, what do you think he sees as the roadblocks to successfully building enough transmission capacity? How would the bill address those roadblocks?) **2**
- *Western Renewable Energy Zones Committee Charter* <http://www.westgov.org/wga/initiatives/wrez/wrez-charter.pdf> Read A. Mission, and B. WREZ Goals. (2pp.) (What are the governors trying to accomplish, here? How does this approach compare to that proposed by Senator Reid in S.359? Might one approach be more effective than the other? Why?) **2**
- *Southern California Edison v. CPUC* (2004), 121 Cal.App.4th 1303 (7pp.) (What did the California legislature do through Public Utilities Code Section 399.25, in its effort to promote renewable energy development? What did the CPUC do in its decision implementing the statute? What are the arguments for and against Federal preemption? Is Federal preemption an impediment to renewable energy development?) **7**

- *FERC Order Approving a Proposed Financing Mechanism, April 19, 2007*. abridged (What is the nature of the special rate treatment being sought here? What issues did FERC see a necessity to resolve before approving special rate treatment for transmission additions needed to serve remote solar and wind installations?) 8
- *Piedmont Environmental Council v. FERC* 558 F.3d 304 (4th. Cir. 2009) abridged. (What are National Interest Electric Transmission Corridors? What is the significance of the designation? How did DOE go about selecting the corridors? What might all of this have to do with renewable energy? Who is likely to be happy with this designation, and who is not? What effect do you think this designation would have on the state certification process for transmission lines? Would there be a different effect if the court in *Piedmont* had reached the opposite conclusion?) 8
- *Energy Self-Reliant States* (2010), by John Farrell and David Morris <http://www.newrules.org/energy/publications/energy-selfreliant-states-second-and-expanded-edition>. Read the Executive Summary and pp.20-21. Skim the rest of the report to become familiar with the assumptions. (What does this report suggest about the need for a national grid to deliver renewable energy? What are the advantages and disadvantages of reliance on local renewable energy sources?) 4
- *NERC: Accommodating High Levels of Variable Generation* (2009) http://www.nerc.com/files/IVGTF_Report_041609.pdf Read the Executive Summary (NERC is the national organization legally empowered to establish rules and standards designed to maintain the reliability of the interstate electric grid. How would FERC respond to *Energy Self-Reliant States*? What factors complicate an effort to incorporate large amounts of renewable power into the grid? What does NERC propose doing about it) 4

Class 10: April 2

10. Biomass & Biofuel – A look at current practice and potential related to biomass use for powerplants, and the evolving effort to develop viable biofuels for transportation. Addressing the energy payback and carbon neutrality of biomass and biofuels.

- *Western Governor's Association Biomass Task Force Report* (2006) www.westgov.org/component/joomdoc/doc_download/92-biomass, pp.48-60. (What are the major barriers to greater biomass power development in the western states? What are the most promising policy options to improve things?) 13

- *Biomass Under Attack*, David L. O'Connor (2010) (What are the primary concerns being raised by parties in Massachusetts?) **3**
- *CPUC Resolution E-4083 Approving Microgy Biogas Procurement* (2007) http://www.cpuc.ca.gov/word_pdf/FINAL_RESOLUTION/71830.pdf pp.4-6 (top) and 14-16 (top). (What is the purpose of the contract approved in this resolution? What is the technology being employed? Why are there issues about whether or not this project should qualify for RPS compliance?) **6**
- *CRS Report: Biofuels Provisions in the Energy Independence and Security Act of 2007* (2008) <http://www.cnie.org/NLE/CRSreports/08Feb/RL34136.pdf> Read the one page summary, and scan the table to get a general sense of the types of issues addressed in the bill. **1**
- *The Law of Biofuels, Ch. 4 Siting and Permitting Projects* pp.1-12 http://www.stoel.com/webfiles/BiofuelsLawBook_2007.pdf (What are the kinds of permits and approvals necessary to site and operate a biofuels plant? Which are likely to be the most challenging? Which are likely to be the most time-consuming?) **12**

13. Alternative Sources of Fossil Fuel – There is a tremendous amount of oil trapped in Canadian tar sands and U.S. oil shale. There have also been repeated efforts to promote the development of a market for synthetic gas, derived from coal. For all three, economic, environmental, land-use, and energy payback issues dominate the concerns. State and federal law play a key role, as well.

- *Development of America's Strategic Unconventional Fuels Resources* (2006) Initial Report to the President and Congress of the Task Force on Strategic Unconventional Fuels (as required under EPLA 2005) http://www.fossil.energy.gov/programs/reserves/npr/publications/sec369h_report_epact.pdf pp.3 (bottom) – 18. (What are the unconventional fuel resources? How prevalent are they in the United States? Why have they not been more fully developed up to now? What are the broad strategies that the Task Force recommends for accelerating the development of these resources?) **16**

Hydrogen as a Fuel – Many leaders talk about a hydrogen future – one in which hydrogen fuel cells provide pollution-free electric power. Hydrogen must be derived, rather than simply harvested. Its production is energy intensive and its broad distribution would require a massive pipeline and storage tank infrastructure. We will talk about where the technology stands and how government is trying to help it to advance.

- *Fuel Cell Report to Congress (ESECS EE-1973)* (DOE 2003) pp.v-ix. (What is the nature of the promise of hydrogen as a vehicle fuel? What are the major barriers to its deployment on a large scale? What can government do to help?)

5

Class 11: April 9**14. Energy Efficiency –**

- *Clean Energy Standard: Potential Qualifying Energy Sources*, Congressional Research Service May 2011
<http://www.ieeeusa.org/policy/eyeonwashington/2011/documents/cleanenergystandard.pdf> pp. 1-2 and 21-23 (What is a Clean Energy Standard? How might energy efficiency contribute to the attainment of such a standard? What are the benefits and hazards of considering energy efficiency in this light?) 9
- *National Action Plan for Energy Efficiency Vision for 2025*, November 2008 Executive Summary
http://www.epa.gov/cleanenergy/documents/suca/vision_execsumm.pdf
Read pp. ES-1 to ES-9 9

15. Combined Heat and Power

- *Combined Heat and Power Partnership – Effective Energy Solutions for a Sustainable Future*, Oak Ridge National Laboratory, December 2008
http://www1.eere.energy.gov/industry/distributedenergy/pdfs/chp_report_12-08.pdf pp.3-28

Class 12: April 16**Student Presentations****Class 13: April 23****Student Presentations****Class 14: April 24****Student Presentations**