

lecture dates	topics	Hmk due	Readings:
			Without the Hot Air" (MacKay) & "Sustainable Energy (Tester et. al) assigned in Homework assignments. Special reading (posted on blackboard)
1 5-Sep intro	Ideas from Mujumdar, Lovins		
2 10-Sep	Energy basics: units, power, forms, US energy use & suppl	Project pitches in class	
3 12-Sep		Hmk 1: US Energy Use, analysis of human powered X (econ & energy), analysis of grow it local	
4 17-Sep	Heat transfer, equipment sizing,		
5 19-Sep	Energy framework: 1st & 2nd laws and efficiencies	Hmk 2: Energy Units, analysis of home energy use, the Conundrum	
6 24-Sep	Heat engines & pumps (cooling.heating)	Owens: "Conundrum"	
7 26-Sep		Hmk 3: Energy conversion, efficiencies, estimation, Auto industry, cost of capital	
8 1-Oct	Start ups & business	Halberstam: "The Reckoning"	
9 3-Oct		Hmk 4: heat pump, : , capacity factor, ,	
8-Oct	columbus day, no class		
10 9-Oct	[tues-but its mon class] battery start up		
11 10-Oct	Energy technologies: Solar (PV & thermal), combustion	Hmk 5: HVAC business issues, building energy use, ,Tesla Vance: "Elon Musk"	
12 15-Oct	Energy & environment: GHG, Sox, PM emissions, US generating emissions, Life cycle cost analysis		
13 17-Oct	Christiansen: disruptive technologies.	Hmk 6: Economic analysis, Thermodyic analysis (1st/2nd law) of cogen,	
14 22-Oct	Economics: cost of capital, annualized costs, capacity factors	& Technical assessment of Wave catcher (team presentation)	
15 24-Oct	Electricity: production and demand.Smart grid issues	Hmk 7: LCA, Disruptive Technology HBS case by Christenson: "Catching the Wave"	
16 29-Oct	Electric AC characteristics: VARS & power		
17 31-Oct	In class exam & Take home out	Note, take-home is major assignment	
18 5-Nov	Grid issues: stability		
19 7-Nov	Natural gas: distribution & fracking		
9-Nov Friday	Take-home due		
20 12-Nov	Solar: Si cell manufacturing: 1366 case		
21 14-Nov	Transportation: auto tech development	Hmk 8: Toyota Prius & A123 HBS cases	
22 19-Nov	Global energy use: how we compare to europe and japan, developing countries		
22-Nov	Tgiving		
23 26-Nov	Battery cases: Fluid batteries & A123		
24 28-Nov	Energy Leadership, R&D strategy & US DOE energy budget	Hmk 9:Energy leadership and US energy R&D strategy	
25 3-Dec	Global energy use: how we compare to europe and japan, developing countries		
26 5-Dec			
27 10-Dec last day class	Project Presentations		
28 12-Dec last day class	" "		
dec 17 to dec 21 final exams	Project Paper due 12/19 Wed by 4:00 pm		