

## EEP100 Lecture 25 (Nov 24, 2009)

### David Zetland

Hand them in, sit down; we've got to go. Everybody wants to go home for the holidays. Alright, I'll be handing back your briefings and making some comments—extensive comments on the briefings. As you know, second briefings are due next week, and we're going to follow a single blind protocol. I will talk about that as soon as everybody gets in here so that fewer people miss it (over there). Homework three is obviously due; congratulations, that's the last of your homeworks. You will see questions that are similar on the final. We will put up the key as soon as we check it, because we haven't done that yet. I will have office hours today at 12:30 after class. And...I'll talk...I'm not sure about the whole... extra credit thing. I put that in an e-mail to you guys.

I've got some interesting suggestions. Most of them involve work by me, which is not what I want, so I'm not sure about how to handle extra credit right now. There is some notion about getting an op-ed published (that's a good thing). Going to the city council and making a presentation (that's a good thing). That doesn't involve work on my part.

And obviously that sounds like a lot of work, but people that want extra credit should be considering that it's a lot of work that they're going to be doing. So, continue to give me good ideas about extra credit if you feel like you want to help your fellow students, or if you personally want extra credit. I don't just give it out like candy. If I could sell it, then that would be nice and efficient, but we're not that efficient.

Any open questions? Anybody? Stuff on their mind?

*When is Briefing 2 peer grading due?*

The peer grading of Briefing 2 will be due a week after the hand-in. So you are going to hand in your briefing 2 next Tuesday, and it'll be due on the last day of class on Tuesday the 8<sup>th</sup>.

*We still have class on the 8<sup>th</sup>?*

We still have class on the 8<sup>th</sup>. There is no new material in class on the 8<sup>th</sup>. I'll be talking about the stuff that you guys do in discussion section. The week of December 1<sup>st</sup>.

There is no discussion section this week; you already know that. There are discussion sections next week after Thanksgiving. And we are going to be doing more games in discussion section. I believe there are points on the table in terms of course grade, so you might want to show up to discussion section. And if you do well, you will get some points added to your course grade.

Other questions?

Alright, let me wrap up some more stuff on benefit cost analysis. Last week I mentioned...this is just a little bit of review stuff...but we want to keep stuff in current dollars. That's why we have this whole thing called a discount rate. We had the discussion about a financial discount rate and a social discount rate. I just made up those letters there. That is not industry wide jargon. But you know what I mean by financial versus social.

We want to make sure that they are in current dollars (or net present value for people who have heard that before).

Secondly, there is a huge difference between willingness to pay versus willingness to accept. And there's that notion of cheap talk.

Benefit cost analysis turns to be super important in policy work. And it's also very political, and it's also very manipulated. And I will get a little bit more into the manipulation of benefit cost analysis with respect to things like building dams when I will get in number 5. My good ideas.

Value of a statistical life? Who remembers what that is? More or less. Ball park figure. What's a life worth?

*7 million?*

Yeah, 7 million, more or less.

Value of a statistical life. This goes into benefit cost analysis. Approximately, your life is worth 7 million dollars if you are a valuable American. If you're an Indian, obviously it's less, according to Americans. And we'll get into that dodgy little question when we get to climate change.

*Is the statistical value for some people...let's say you are a neuroscientist who has years of education, compared to other people who are...*

Are you being sexist by saying scientists are men? So that's a good question. Let's take a little excursion on VSL for a second. First of all, I don't know if I told you how it's calculated. Did I tell you that? How it's calculated?

So what they do, basically, is they look and they say (they...these scientists...these statisticians, really) what they do is they look at someone, and they go at a kind of a risk reward axis here. So let's call this reward, as in your salary. And let's put this as risk (As in the likelihood that you're going to die).

And if you are, for example, a post doc teaching at Berkeley then you're going to get a salary that's here and a risk of dying that's here.

If you're a professor who's at Berkeley then you're going to have a salary of here and a risk that's even less because you don't talk to students. That's a joke. Bad joke, okay.

So what they do is...you get these office workers type of stuff...very low risk...but then you start getting into...well what about if we have a coal miner who's out there...has a risk of death because the mine might collapse, and they might be making post doc salary, but the same person in terms of human capital...you guys have heard that before? You're here for human capital? Education?

So that very same person (this is they key)...not that you have a post doc or you're a professor... but this same person might be able to take a lower paid, less risky job working at the video store, renting stuff. You have a high school education, you can shovel coal or you can rent movies. So there's this kind of tradeoff here essentially between risk and reward. And if you look at enough

professions, you get, you know...any profession that you have...if you work at a machine shop, or you work as an airline pilot, or you work as...and actually I think the military gets excluded because the risk of death is part of a different type of occupational hazard.

They look at the tradeoff between these two things and they basically say, "Well, how much are people willing to trade money for death, voluntarily in a market?"

So this doesn't work in a totalitarian society, does not work with the Gulag with the slave camps, but it does work with free market societies where people with a certain level of human capital are able to take a job with a certain tradeoff between risk and reward.

And when you are calculating this, you basically can find out...if this is the risk of death, and you just take that line out to 100% chance of dying, then you get a number. Which is equivalent to a professor's salary. No. which is equivalent to 7 million dollars. Something like that. That's how they figure out this VSL.

*But that is I value the death...*

Given that line.

*Given the line, and I arrive at 7 million dollars, then wouldn't that logically mean that I could have somebody pay me \$7 million to kill myself?*

You can't spend the money—sucks. But this is in a sense, because it's your...it's not how much you will be willing to be paid to die in a direct...like...please shoot me. But you're taking that risk. So statistically speaking...you are taking a high...it's taking statistics and kind of stretching the definition, right?

So statistically...look at it this way. If you have a 1 in a 100...say that your current job, you have a 1 in a 1000 chance of dying, and you're willing to take a different job for a higher pay, which has 1/100 chance of dying. You personally go to work everyday...you're not thinking, "I'm going to die today." Right? but there is going to be a higher salary attached to that—at least in your mind and in the market in terms of wages, right?

So in that sense, it's...let's call it equilibrium. You're willing to take that kind of chance but you're not...It's just being paid enough so that you have a statistical chance of dying—not that you're going to be dead for sure.

*So why do they take 7 million and not half of that? Why do they take the highest cost of the value, but not the average?*

Oh no, but this is kind of an average...if you actually did this for a professor and say, "How much are you willing to pay to take a deadly professor job?" then it would be like \$7 million because I'm so valuable.

*That's what everybody...*

In a sense, yeah. Mostly, these are calculated against blue collar jobs, usually. Blue collar meaning you touch things that are dangerous (not paper...paper cut death...).

*So is it the department of labor that calculates this?*

It's...the EPA has the number because the EPA uses it for environmental damages and the risk of dying from toxic exposures and stuff like that. I don't know. It could be the bureau of labor that does the statistics...it could be somebody...somebody does it. In fact, there's arguments over who's VSL is better. And every country will have their own statistical division doing this calculation. The U.S. number tends to be 7 million.

And then...you have...also...as part of this calculation is...DALY...who remembers what that stands for? I can't remember the definition right now. It's...maybe I'm using the wrong acronym...but the idea is how many more years of life do you to live...if you die of this thing, how many years of life do you lose? And this comes into the debate about AIDs vs. Cancer. Because your average cancer death occurs at...let's just say 65, and your average AIDs death (let's just say) occurs at age 35.

Are those the same deaths from a statistical...from a social perspective? No. Let's just say you have an average life expectancy of 85. If you make it to 35, 85 is in the ball park. So basically, you are losing 50 years versus losing 20 years. And this is what people pay attention to in terms of...if you have a certain limited budget in terms of you public health budget, and you need to figure out where to spend the money, do you want to spend it on curing AIDs or curing cancer? It's the same concept as triage in the operations room of a battlefield hospital. When you come in off the battlefield and you lost a leg and the other guy lost his head, the doctor's like, "The head guy is dead. I'm going to work on the leg guy."

Or leg guy versus stomach injury. Stomach injury—well whatever. Leg guy—I should make sure he doesn't bleed to death. When you have a doctor in the battlefield making triage decisions, that's literally saying: that person is going to die for sure. That person might die, that one I should probably save; if I don't, they'll die.

And they literally decide life and death. That's what Triage really means. This is a form of public health triage, which is—where do we put our budget? Should we put it into cancer research where we might save 20 years of every life of somebody we cure from cancer? Or AIDs, where we save 50 years of life? That's only on the benefit side. Remember the cost side. Condoms compared to crazy cancer treatments. Cancer treatments are extremely expensive and it only gives you 20 years. Condoms are whatever...abstinence only (according to some people) is worth 50 years. So the cost benefit on AIDs health prevention is insanely high compared to cancer work.

And that, in some ways, is one of the reasons why a whole bunch of money has been pushed at aids...except, there's the whole PR, political pressure thing from the AIDs group that started in the 80s in San Francisco, and then cancer groups come in, and you have all these band bracelets and stuff like that.

So all of these...this kind of debate over (I don't know if it's DALY or not) ...this kind of debate over what a life is worth goes into the public policy debate on where should we put our money. If you're an individual, or even if you're Bill Gates...no...that's not right.

Think of...there's a couple of celebrities out there who have autistic kids, and they've been really pushing for the debate between vaccination and autism...has anybody heard of that? Like...if

you vaccinate my kid, they'll get autism. And there's a huge argument in public health people... because they're basically say it's correlation versus causation. Let's just put that aside for a second. We do know that when you have a celebrity spokesperson for your particular affliction, you're going to get publicity and money ...if it's not even the celebrity's money. So the whole back and forth of PR and advertising, essentially, is how money also gets allocated.

If Angelina Jolise shows up at the US Senate and says, "Senator..." (sits on the guy's lap...) "I need some money for saving people"...that budget appropriation is showing up, right? That's how she persuades. The other girl...the spicy girl...she's the UN Ambassador for something... for public health or something like that...she's out there visiting ministers, and she's like, "I'm a Spice Girl, pay attention to me." And they do. You know. See what I'm saying? Does that make sense? Do you see that ever, in the media? That pattern?

Hi, I'm an anonymous person on the street. I want you to give money for whatever...that doesn't happen. It's celebrities that push these things...the same ways celebrities get involved in war debates and stuff like that. So the thing is—there's some science going on in terms of this public health thing. It's also getting pushed back and forth in terms of politics and celebrities and stuff like that. So that's what is...all the other stuff is going into benefit/cost analysis, which is...

Basically, benefit/cost analysis is...if your benefit over your cost is...which one? Do I want greater or less than one?

*Greater*

Greater than one...then it's a good idea. But what if I have a benefit/cost...I've got a benefit/cost of project one is equal to 1.5, and I've got benefit/cost of project two is equal to 2.5; which one should I do?

*Two.*

Okay. But then Tom Cruise says, "This is important." And guess what happens? That will get done more often than not. And this matters...not more often than not...but quite more often than you want. This matters because there's a limited budget for expenditures. So this project will get done; this project will not. So you guys—when you're doing your analysis...if you're actually using the economics, you want to be able to say, "This is what we should be doing; celebrities are not."

No celebrities...Tom Cruise can come in and say, "Yo, Tom, if you fund half of this cause, then we can get the B/C up to 2.5, and then everybody's happy."

But Tom is going to be saying...he's like, "Oh no, sorry...I have to take my money elsewhere."

So there's a notion of cheap talk from people that are pushing their own pet projects. Cheap talk in a sense of...are you putting your money where your mouth is? Or are you just sitting there... you're willing to do a PSA, but you're not willing to put \$5 million down.

*Is that an "e" or a "c"?*

This is a c. Benefit over cost.

*What is WTP?*

Willingness to pay. How much are you willing to pay me so I don't kill the whale. Or how much are you willing to accept if I get to kill the whale. How much do I pay you to kill the whale? So these numbers are different. Which number is different when you ask people these two numbers?

Willingness to accept. People are always saying, "You want to kill the whale? A million dollars."

How much am I willing to pay to save the whale? I don't know...I have like \$20. That's what happens. Now...one other thing about benefit/cost analysis...notice: numbers, numbers, numbers. Most people are like, "Wait, you can't put the value on a life!" Right? You can't put a value on a sunset, you can't put a value on a clean environment...our children's future. Or you can't put a value on how nice it feels to recycle. So there's a quantified (which is the dollar stuff) versus qualified.

So you have quantified costs and benefits versus qualified costs and benefits. It's stuff...you have a notion that it is good, but it is a more subjective value.

This is more subjective, and this is more objective. And you do want to include subjective costs and benefits in our analysis. If you're doing an analysis, you're going to sit there and you're going to do a benefit and a cost...and you're going to have \$1 and -\$1. And you're going to have a life...

So remember the baby seat thing? You'll save one (the baby seats on airplanes) baby life by putting a seat on the airplane, and you'll lose 1.5 baby lives because people who do not take the airplane take the car, and then die in the car accident, and their babies die.

Someone did that analysis...like holy cow, this is actually really a bad idea. So you have 1 life versus 1.5 lives. You understand...you can quantify...you can quantify those.

But what if you have this versus that? What the hell does that mean? You have to include it, though, in your analysis, though...at least so you put it on the table, and you can even let people...if you're doing decision making, and you're trying to get a decision maker to make a decision, you say, "Look...you have to figure out what the value of a sunset is...or a happy voter or whatever."

You define/assign your own subjective values to this. And then you give them the spreadsheet and say, "You can play with the numbers."

But if the subjective value of happiness, or a happy voter, is \$200, and that's way higher than you really...in order to flip over the benefit/cost...does that make sense (what I'm talking about?)

They have a spreadsheet. Let's say it this way: let's say that the benefit is 10 and the cost is 10. And then...so they're even. They're not sure if they should do the project (the decision maker), okay?

And there's this kind of a loose thing going on here. What the hell is this? And the politician says, "You know, that's worth about \$10 to me."

But the cost is like \$15. Then that politician is assigning his own subjective values on these columns here and that flips the benefit/cost against the project. Do you see? And that is what happens. But at least you're making it more explicit—what information is being used to make the decision. The fact that there's subjective value being put in...there's nothing you can do about that; people are just like that.

If you sit there and say a church versus a mosque, you're going to have completely different opinions about what should go here. And your work as an analyst is not to assign values on that.

*What about situations where...on the benefit side...the benefit is made up of...for example...we're building a bridge. The cost associated with that is the taxpayer's cost, and then there's one construction company, and they get the huge chunk of benefit out of it, and everybody else gets a little bit of benefit out of it...*

Do you mean the cost? They get the contract from building the bridge.

*Right, so they get...to them it's a benefit though.*

No, but if you're the decision maker, you're only looking at the cost to construction. That's...who cares where that money goes. That's the cost to society versus the benefit to society.

*So you don't take individual benefit from that into your...*

Well, if it's a cost to society that goes to a benefit of the individual, then you just keep that clear. When you're doing benefit cost analysis, spending money on a bridge does not become a benefit to society.

*Right. It doesn't become a benefit for society. It may be driving across that bridge is the benefit.*

That's right, yeah.

*So that one construction company does not go into the benefit analysis.*

Not unless they enjoy driving across bridges.

*Okay.*

Yeah?

*Don't new deal programs...didn't those depend on the costs actually being a benefit to society? You give people jobs...*

Right, so the other thing is what you were talking about before...just like a transfer of wealth. If you give me \$10, society is not better off. But if you're doing a cost benefit, you're looking at a project. Should we do this project given I have a limited budget. When you talk about the new deal, it was essentially... and what people are talking about right now with the stimulus.

Let's spend \$800 billion to make everybody...we'll borrow it from ourselves, we'll spend it, and make everybody better off by building bridges and stuff like that. So there was some notion of... we should spend our own money to put ourselves to work, so that we feel good, so that we can

have enough happiness to pay back our own money. Some kind of...it's like lifting yourself up by your own bootstraps. But that was based on the whole idea of needing to stimulate aggregate demand. That's the whole Keynesian debate. I don't know what to tell you. The stimulus, from a public policy perspective...the benefit/cost from the stimulus has turned out to be tragically small. The benefit.

If you've seen the numbers...I've been putting some numbers up on my blog...\$700 thousand per job, which...dude I'll work for \$700 grand. I'll dig holes. The problem is even worse; they've actually been making...the jobs have been made up—a lot of them.

This guy sold 5 pairs of boots to workers (construction jobs), and he was getting credit for creating five jobs. And there's been a lot of really bad examples. The 9<sup>th</sup> congressional district in Arizona...they received \$750 thousand of stimulus money, but there is no 9<sup>th</sup> congressional district in Arizona...it doesn't exist.

And someone pointed this out saying, "Well, I found this on the website about government transparency," but that's the point. Government transparency is that you see that there is no congressional district. Because in the old days, you'd just start sending out money, and someone would say, "Yeah, I'm from the 9<sup>th</sup> congressional district." And someone's like, "Sure, go ahead; there's a lot of you guys." So...700 grand...that's a lot of money to steal if it was stolen. But they got caught, in a way.

So the whole stimulus money thing is kind of like hocus pocus stuff, as far as I'm concerned.

Different long debate...let's not talk about that right now. Other questions? Do you have a question still? Any other questions on the BCA stuff? I'm going to go to the next topic. Yeah? Okay.

Climate change. Okay, yeah, talk about not controversial. Let me say just a few things. The Copenhagen Summit is happening somewhere near in the future in this place called Denmark, which is one of the super green places in the world. I think one of the highest rates of bicycle riding in the world. And the car ownership...the car tax...I think it's like a 200 percent tax on purchasing a new car...so if you buy a new car, instead of paying 20,000 dollars here, you'd pay like 60,000 dollars in Denmark. For some reason they don't buy a lot of cars.

Now, they're going there as a notion of updating on Kyoto, and I don't know very much, but the whole idea is that we need a worldwide agreement on what to do about climate change, which is pretty damn hard. It's a big collective action problem. That's the stuff you guys have been thinking about and talking about and all that stuff. So that's just happening. That's the thing that you guys should watch in the news. It'll happen I think in the next...does anybody know the date? Like...December something?

*7<sup>th</sup> to the 12<sup>th</sup>*

7<sup>th</sup> to the 12<sup>th</sup>. My prediction is that they will have a communiqué come out after it where everybody is very worried about climate change, and they all promise to do something, and then we'll see you in 5 years. So nothing will happen. The US, of course, from a political perspective, has not gotten anything together in terms of action on climate change. They might be forgiven if Obama gives a nice speech. That'll be good. And the big deal, though, is that in a

collective action problem...if you're going to cooperate in a public goods game, the people you are playing with...you want them to show up and play fair. You don't want them to defect. From a policy perspective, the US has been defecting from climate change negotiations ever since Kyoto happened. We're not going to do it; you guys go ahead. Take care of the planet. We don't need it. We've got...we want to drive our SUVs around. So that has been a huge impediment. Europeans, of course, set up their own carbon trading and cap and trade. It's kind of had little bumps in the road, but it's way more than we got; we're still debating cap and trade. Let alone all the disasters on that, which I'll get to in a second...US disasters on cap and trade.

So if the US shows up, makes the right noises, that could help in terms of pushing along global negotiations over climate change. As I mentioned earlier in the class: it is the world's biggest collective action problem. It could be the end of the world collective action problem, as far as we're concerned. As everybody knows, the earth will continue whether or not we are here.

The big two players are the so-called G2: China and the US. The US, of course, is historically the biggest emitter of pollution in the world. China—I think if they haven't passed the US, they will pass the US quite soon (obviously on a per-capita basis China's only at 1/4 of US emissions). But they want to have an American lifestyle, right? so that means big cars, big houses, lots of plastic...actually the Chinese like plastic more than us, as far as I know. I love going to China. You get a bottle of water. It's not just a bottle of water. It's a bottle of water in a plastic bag with a plastic straw. And you tear out the bag, throw that away, tear out the bag around the straw, throw that away, put the straw in the plastic bottle, drink the liter of water, and throw that away.

So that's kind of like a conspicuous consumption. I have enough money now...if you go to poor places in the world...the poorest places in the world have no garbage, at all. Everything...it's not that they only deal with natural materials...everything gets used until it disintegrates. A glass bottle, a plastic bottle, a T-shirt...you see people wearing T-shirts...the holes are bigger than the shirt, but they will wear that stuff. Very poor people do not throw anything away. When they get wealthy enough to start throwing stuff away, they do. They like it.

I went to Albania in the 90s. They just got out from one of the worst dictatorships in world history. They loved littering. It was so great. They were free. In the old days, they'd go to jail for dropping stuff on the ground. And that was their kind of freedom. They just throw crap on the ground. So there's a bit of a problem there in terms of us (the Americans, let's say) going around saying, "No, no you guys can't pollute, you can't have carbon, you can't throw plastic on the ground because it's bad."

And they're like, "Whoa, we have to enjoy ourselves. You guys just did it for 50 or 100 years."

So that's...there's actually a push and a shove back and forth.

The Americans wrecked the world, the Europeans did a little but, but the Americans wrecked the world, and now we're saying to everybody else: "No, we shouldn't do it. We ruined it for you. You should be virtuous now."

So there are these moral arguments. The Indians and the Chinese agree on this stuff—you get your whole line of developing countries.

So what's going to end up happening, of course, is: who's going to pay for it? Climate change is not going to be free. The first thing you're going to have to consider is that everybody (and this is...I don't know why this is such an open secret...) but everybody has to use less. Our lifestyles, Americans especially, are going to have to go to a lower consumption. Full stop. Not bamboo pants and organic sushi...no sushi. Only 4 pairs of pants, not 12 pairs of pants. That's the kind of stuff that everybody's like, "Oh my god, I can't handle that." And they don't want to handle it.

So...number one, top line consumption is going to have to fall if any of this stuff is going to happen in terms of climate change.

And number two: somebody is going to have to pay to either clean up existing technology, develop new technology, or clean up the environment...that idea...geoengineering? The idea in super freakonomics—complete disaster. That's my summary statement on that. I can talk about that later if you guys want to know more.

So...here's an interesting statistic. You've got...say you want to do a global regime of cap and trade on climate. Let's say that the average output per capita...we don't even care what it is, but let's say it's...what we want is we want an average output per capita of 1000 tons per year of CO2 equivalent.

Methane gas is much more...1 ton of methane is worth like...20 or 30 tons of CO2. Something like that. Big number.

So we talked about CO2 e—equivalents. Let's just say...it's 1000 tons CO2 equivalent per capita. And that's where we want worldwide. We've got 6.5 billion people. This is just for the sake of argument. I don't think 1000 is right.

So if we're having that per capita output, and it's a global cap and trade, and the average American is using...I wouldn't be surprised if it was 4 times that number. And then let's say that the average...let's just say for the sake of example...the average Indian or Chinese is using 500 tons per year per capita.

If you're going to do cap and trade, what does this imply?

*If you have 500 then you kind of have an advantage?*

If you have 500 then you have an advantage?

*You would be able to sell the credits.*

Right, let's start with that. If everybody is supposed to use 1000, then every human on the planet gets a permit for 1000. If you're only using 500, you can sell it. If you're using 4000 you have to buy it. And I would not be surprised if it's some kind of number...remember that the price (I just made up that number here, but let's just say that that's true for a second) the price in Europe right now is about 20 Euros a ton for carbon. The US...they're throwing around prices...10, 30, 40 bucks...whatever.

Let's just say it's \$20. Say the average American gets a permit for \$1000. It has to go buy 3000 tons of permits. That's a very messy 20.

That means the average American has to pay \$60,000 to the folks elsewhere on the world. Now, that's a big number. Let's say it's even \$5000. Anybody? Volunteers? You want to pay \$5000?

If you're actually from China, and you're living in America, bad news. You're living the American lifestyle. You want to pay \$5000? No. So are we going to do well with our climate change negotiations?

Basically it's like fuck it; I don't care...it costs too much. I'd rather see the world die. That's it. That has been the US negotiating position for the last 10 years.

If you want to be depressed, this is a good topic. This is completely unavoidable truth as far as what has to happen. We don't get free lunch. If it was free, we wouldn't have a climate change problem. We would live in a post-carbon society. We wouldn't be using coal.

We'd have fusion-powered reactors in our pockets. We'd just plug it into the car and the car would drive away. But we don't. We're not Buck Rodgers in Star Trek, right?

So the problem with climate change is money. That's it. We like our lifestyles, and we don't want to pay for it.

And everybody is going to Copenhagen to argue over who is going to pay for it. And no one wants to pay for it. It's the same thing as the stimulus. Let's just borrow from ourselves and stimulate ourselves, and then we'll all be rich again.

It's the same thing as the water negotiation that I ranted about a couple weeks ago. Let's just take \$11 billion that we don't have and pass a bunch of laws that aren't going to do anything, and congratulate ourselves.

Complete failure. That's the debate that's been going on with climate change for a long time.

*Couldn't it be that there are some...I mean...this cap and trade agreement...we can't really rely on laws that somehow could control everybody and manage everybody's consumption...oh, red light, you went over 1000, pay somebody...I mean you could also...but what about people who have intrinsic motivation to just do less. Couldn't that be another strategy to try to get more people to do that...by themselves...*

Yes. So, in my blog, I have a tag. I call it 2080. The 2080 rule. And I just made up this jargon. And what I say in water is that 20% of people actually want to use less water energy...save the earth, whatever. They take short showers, they contribute to green peace and all that stuff. 80% of the people don't care. It might be more like 5/95. But some people really do care. They usually live in Berkeley.

If you go out into the Central Valley...I mean I saw some of the people who were being interviewed on a conservative television network about a conservative topic. And they were not Berkeley people. They were like, "Who are you to tell me what I can drive or shoot or eat?" there's a big debate.

The whole...the vegetarians are up in arms saying, "Hey, what's up? We've been ahead of you guys for decades, centuries." And the meat eaters are like, "I like beef."

So 20% of people really do care, and if the rest of the world was full of those 20%, or 10%, then we wouldn't have this problem. Because it'd be Gandhi. Remember Gandhi...he said...we should all live in villages, and make our own cloth, and be a little community, and that's good enough for me. I'm happy. And the rest of India is like...cell phones, rickshaws...you know...all that stuff.

*But at the same time...if you take the example...smoking...years ago, everybody smoked. If you told somebody, "You can't smoke in this train station." They're going to look at you and say, "What do you mean? I'm going to smoke." So I mean...societies are able to adapt and shift forward. So couldn't it be possible...maybe through this whole debate, in 20 years...it might take more than that...but in 20 years more people will realize...*

Yeah, so that's the second half of the 20/80 rule. 20% of the people really care. 80% of the people don't care. But if you charge them, they'll change. You have to charge them. You have to make it illegal, which is a sense of a charge. I'll tell you...the big problem in climate change is...I don't call it global warming; I call it local warming.

Because who really does care if Bangladesh goes under water. It's only 150 million people. But if the ski season shuts down, whoa. That is a big problem. If you want to convince people in the Bay Area that global warming is a problem, talk about the ski season. Don't talk about Bangladesh. Make it local so they pay attention. You're children will die. My children? Oh, well that's important. You see?

*So given the costs, each individual person will have to pay for this cap and trade system...what if...instead of having them pay for their carbon emissions, you let them do whatever they're doing right now, and take like...half of the money that would be required to do that and invest it in subsidizing solar energy or subsidizing nuclear power generators...and it won't solve the problem now, but like...in 20 years, we have our fusion generator pocket thing...then the problem will be gone.*

Yeah, that's in a sense what I was talking about in terms of...you buy your pollution. And that money has to go somewhere.

*Right. But what if that's more money than we need...how much money would it be? The market price for...using your numbers...there's only 300 million people using the 4000 and the rest of the world...it's 500 to buy, so the price for the permits is probably going to be relatively high, right? And you estimated like 6000 dollars. So 300 million times 6000 dollars is...*

A lot of money.

*It's more money than we probably need...and I don't think there's that much money...I mean...if you ask...*

So, regardless of the amount of money, what would you do with it?

*Reinvest it into science.*

Yeah, but that's part of the debate.

*I'm just saying...I mean that's an alternative solution*

But it's not necessarily a solution.

*It's an example.*

Right, but it's...so the idea is...where would the money go? Part of the money might go into buying permits from the Indians and Chinese. The other part of the money might be going into technology, right? But notice...the whole...everybody's in DC going, "Yeah, we're going to save the world. Give us money."

The auto industry: stimulate us; we'll make green cars. Did anybody see the Chrysler move? Chrysler was not only...it went bankrupt, then it got bought by a private company, then they got bailed out by the government, and they...number one on their list of things to do was: green car. They got \$10 billion, and they cancelled the green car program. Remember sunk costs are sunk? They got the politicians to put the money on the table, then they got the money. Screw the politicians. They don't want to do that. Doesn't pass the BC test. We want to sell SUVs. We make more money from SUVs than we do from electric cars. Those are worthless for companies.

So there's a lot of people out there saying, "Stimulate us, and we'll save the world with your money."

Like when we needed a cure for polio. We gave a bunch of money to the scientists. We didn't say, "Oh, thanks for the money." And like...left. There are people who would take the money and actually put it forward to solve the problem. And so I'm not suggesting that we give all our money to car companies. But there's plenty of scientists who...at this University, for example, who would work on making real solutions to our problems for a lot less money than it would cost.

That's right. But the whole wall of money that's moving around on climate stuff right now...or the potential money...that's why the negotiations are very tight, because there's so much money at stake. Forget healthcare. This is crazy money. World wide trillions. So the political debate, essentially, is who's going to get that money. Who's going to pay it, and who's going to get it. And you're talking about a piece of that action. I completely agree that that's important. The idea that innovation and competition and stuff like that can help us solve this problem is another thing. But I will tell you that my top line comment (we have to use less) is standing, no matter what the technology.

*I think another good way to do what he was talking about, partially with solar panels, is that they're really, really expensive to install, but if you can afford them, the government gives you incentives to do so. And so the people that can afford them pay for them and get them and get the incentive. And that money goes back into developing more cost effective...*

Right, the idea of subsidizing a good technology.

There's actually...there's a slightly more clever way of doing that. So instead of taking a solar panel array, which might cost \$15 thousand dollars, and subsidizing it for 10 thousand dollars...I mean...there's some really big subsidies being thrown at solar.

One of the innovations is to put a loan on the house that stays with the solar panels. So if you sell the house, then whoever's paying off...it's a type of debt...like a street improvement...this kind of debt...and then the house is worth more because it has solar on it. And the debt of paying for the solar gets paid over how many years. 30 years or whatever. So that's a different story.

*Doesn't Chicago have a local cap and trade system?*

There's a lot of cap and trade stuff being tried out. There's a Regional Greenhouse Gas Initiative—RGGI up in the Northeast of the US.

There's a Western Climate Change Initiative—it involves California, some western states, and Canadian states. A lot of observers...states that are checking it out.

There's actually a carbon tax in the Bay Area. Did you guys know that? There's a carbon tax already. It's 4 pennies per ton...not very big. But on the other hand, all you have to do is crank it up and collect all that money. They have the accounting system in place.

Number one: they got it to go into place. Number two: they got it working. And that is actually the biggest two problems...the big barriers to a carbon tax. And they just crank it up from 4 pennies to 4 dollars or 40 dollars, and the Bay Area would suddenly have a carbon tax that was working and binding. A constraint.

*I was going to ask a question...I don't know if it's off topic...*

Everything's off topic.

*There's a lot of debate about the cap and trade and like how...putting it on a carbon tax...the first carbon tax was on the sulfur, right? The acid rains...and that was easy to monitor and easy to...basically...easy to implement that system on sulfur because it's easier to monitor. But they're saying carbon...it's too wide, and there's too many sources, too many outlets, so it's going to be too difficult to actually implement it...*

Is that your question?

*I was just going to ask you if it's...*

Is that hard? Or is it efficient? Yeah...the question is, essentially: can we monitor carbon sufficiently to do cap and trade or tax it, for that matter? And the short answer is yes, we can do it. It's a lot more work than doing sulfur dioxide because sulfur dioxide...the SO<sub>2</sub> emissions were being monitored at 2 or 3 hundred different sources—mostly power plants in the Northeast. And carbon emissions...you know...every car that burns gasoline...it's like...well wait a second...but you can tax...

Because carbon doesn't get transformed even when you refine it...you can tax petroleum at the port of entry or the...whatever refuge you're pumping it out of...or shoreline. So you can tax carbon upstream. You don't want to tax it downstream. I mean...this is actually kind of a scare tactic by people...every time you turn around, you have to pay a carbon tax on a candy bar. It's like...you will, but that carbon tax is imbedded in the cost of the candy bar. The same way that...much more so than sales tax...but in the same way that the gasoline goes into the...the

diesel that goes into the tractor that grows the corn for your Coca Cola corn syrup is already imbedded. So it just passes through the system. That's not a problem. Getting the political agreement on it is.

Yeah?

*Who is paying the carbon tax now?*

Who is paying the carbon tax now? Well, we do. Consumers pay carbon taxes. The little four cent one in the Bay Area? Yeah, we're paying it.

*Everywhere?*

Everywhere in the Bay Area, yeah. But it's very small. So the Chevron refinery up in Richmond pays the most...total. They pay \$300,000 a year in taxes. That's like...they spend that on paint. Right? Or on hats. So that's nothing for them. So it gets passed through. Did you notice? Has your lifestyle declined? No. No biggie. But the carbon tax has to be big enough...you want price to be big enough to affect what you're doing.

People are like...If you buy a bottle, and you pay a 5 cent deposit, and you throw it in the ocean, and you kill a turtle, the 5 cent deposit hasn't done anything. The price has to be high enough to get your attention. That's the bad news. Everybody's sitting there going, "We're going to have cap and trade, carbon tax, and prices won't go up."

Whoa, hold on. There's a complete failure of logic in that statement. The price of energy has to go up, and you will use less. That is a goal. Anybody who says differently is like...selling garbage. Bullshit.

*With smoking and the ozone layer issue...it was a fear thing...so people were really, really scared.*

Smoking was secondary smoke problem. So people were afraid of getting cancer from smokers.

*Yeah, and with the ozone, they didn't want to get cancer...skin cancer.*

Yup, the Australians especially.

Yeah, so do you think the fix for public awareness would be to scare the crap out of people, and say that they're going to die of...

Well that's the thing. Some people say that Al Gore is just out there scaring people, and there's nothing really happening. And Al Gore has lots of investments. I put up a blog post on this. You know...he's a multi multi-millionaire based on green investments, but on the other hand, he's a multi multi-millionaire because he put his money where his mouth was. And some people are like, "Well, he's moving the debate; he has political friends. They're making laws that favor his companies."

Let's put that aside for a second. To get political action, essentially...after Katrina destroyed New Orleans, we have a whole bunch of political action on levees. And then everybody forgot about it and went on to the next thing. So politics moves from one fear to another.

The War on Iraq. Weapons of Mass Destruction. We're going to die tomorrow. He has bombs. They've got that on tape. Bush and Cheney and everybody saying he's got bombs...it's going to happen tomorrow.

You thought 9/11 was bad. That was like fiction. But it was politically motivated fiction.

Last hand, and I'm going to move along on climate change.

What about...a lot of people say there argument against taxes to increase the cost of energy would be that so many jobs would be lost because everything would get more expensive, and people would buy less, and...what do you think of that?

I think it's bullshit. Everybody who's sitting there going, "We're going to make jobs or lose jobs" is all bullshit. Period. So here's what happens—it's not jobs...what they care about at jobs...at companies...I've got a coal mining company and I'm doing mountaintop...I'm blowing the top of mountains in West Virginia, dumping all of it into the river, destroying the ecosystem and local community, but I've got jobs.

If you tax coal, I'll lose jobs. No you won't lose jobs, you'll lose your business. Those workers will go plant flowers or knit or they'll work at a car company, or they'll do something else. All that rhetoric about jobs is bullshit. It's all about giving money to the businesses. And especially the coal companies. Especially the coal companies that have the mountain top mining right. Those rights are worth nothing if you can't mine them. The workers will move to another job. So what I say is like...don't protect jobs, protect people. Protect people. All that creating jobs is just like...I've lost track of the number of times I've seen bullshit behind that. It's like...protect the jobs of US Auto Workers. Who gives a shit about US autoworker jobs? Those people could work in a million jobs. But those auto companies...that's what they're trying to protect. There's equity. There's shares. There's capital invested. That's what has been happening over and over.

Robert Reich, who was the labor secretary under Clinton, just gave me that enlightenment...hell yeah, no corporate welfare. And he's like the most leftist economist in the...in the UC I guess...in Berkeley. But he's absolutely right.

And when someone says, "Oh, you need to protect jobs at GM." It's like...they don't give a shit about jobs...and the union guys did the same thing. It's like...protect union jobs. Because the union organizers...they would lose their jobs if all the union workers go off and work at schools and plant trees, because there's no tree planting union. Did you see that stupid thing...the... Service Workers International? They were on strike somewhere...I mean...the whole protest thing at Wheeler Hall because they wanted to restore custodian jobs...but this Eagle Scout went and spent 200 hours clearing a path through the park. Because he wanted...you know Eagle Scouts—you've got to get a merit thing. He's like doing the good thing. You're a boy scout. He's clearing a path; he spends 200 hours...that's 5 weeks of nonstop, full-time work to clear a path, and the union is protesting that he's taking their jobs. Because they want a monopoly on clearing the leaves on the path, so you can be paid \$40 or \$20 an hour plus pennies.

That's not jobs. That's like...protected stuff. And it's the same thing...I'll say...professors with tenure...they don't want to work either. That's why they have tenure, so they don't have to work. That's what tenure's all about—lifetime job security.

That was a bit of a rant.

Let me go back to...so we know the US-China dynamic. The Chinese are like...hey, you've got to pay us a lot of money. The US is like, "We don't want to pay a lot of money." The Chinese are like, "We want to pollute." The US is like "You can't pollute". So you could see where that's going. It's very tough.

Climate gate. Has anybody heard of this expression recently? Last week? Climate gate. Some hackers did a good job (I think). They exposed a bunch of emails and data from climate researchers and scientists to the world.

My dad (who does not believe in climate change...he watches a certain network...)

He sent me an e-mail: "Is this true?"

So what happened is... all of this data came amount and it says, "Oh, that whole hockey stick (CO2, anybody seen that?...this is time, this is CO2...) That whole hockey stick is actually like this. All this data is fabricated. Whatever. And so and so wants to publish a paper in a journal saying that climate change isn't happening, but so and so...the other academic says, "Don't publish it; I don't like him." Or "I don't like his results."

So these academics are essentially stabbing in each other in the back, like usual. I had this on my blog this morning, so I'm kind of reading you something. But basically, the whole climate gate is that it exposed the whole backroom debate among climate scientists. A little bit of data...I don't know what's going on with the data, but we will see, you guys should look it up if you want to. A little bit on the data...do we actually see global warming in the data? It's a big...and I know that people who don't like climate change and do like their SUVs and do not want to pay \$6000 a year...how are they going to see this development about scientists maybe fabricating data? What are they going to say?

### *Conspiracy*

Conspiracy, I told you so. It's Al Gore. He just wants to make money, which is probably true, right? But the thing is...is climate change a complete fabrication by a couple of scientists...that intergovernmental panel on climate change. Sounds like a communist conspiracy.

Well here's what I say, as a free market person. If any person...if any scientist could come out with evidence that climate change wasn't happening and global warming wasn't happening, Exxon Mobile, British Petroleum, and everybody else would get him the Nobel Prize (or her) of all time.

Lifetime billion dollar a year income string if you could prove that. Why wouldn't they? A whole bunch of special interests we know are fighting tooth and nail against climate change. If there was incontrovertible evidence that climate change wasn't happening, they would be so happy. They would pay billions. They already have thousands of scientists working against... trying to find evidence that climate change is not happening. So some of those e-mails and all that stuff...it's just bullshit, in terms of why it matters.

It's typical and nice gossip, but I know they were going to say, "Oh, it's not happening, but that's...I think...you should think about the whole incentives, right? Who has an incentive to show this up?"

Let me tell you a little bit more about the realities of negotiating over climate change. On campus, here, they have the Mathematical Scientist Research Institute, where I used to work when I was a secretary before I went to PhD land. And they had a workshop. Then I came back to the PhD, which is kind of impressive. You know...secretary to PhD. I was first in line for the coffee, not last. I had privileges.

So they did a workshop on games and climate change. And they have some of the top game theorists in the world. What kind of game is climate change? Is this a ludic game? Do we use ludic theory or conflict theory? What does Ludic mean? Ludic means what? Rules. What does conflict mean?

No rules. You bring your baseball bat or your gun, or your dinosaur. Tyrannosaurus Rex.

Is climate change a Ludic game? It's a conflict. There are no rules in climate change negotiations. So at this MSRI thing, we had some of the top...this is like Princeton and Yale and all these high-end schools (of course, Berkeley), and they're all coming to work on mathematical models for solving climate change negotiations, etcetera.

They had all this game theory...they had all these game theory and they had the first mover, second mover advantage, the Stackelberg leader...they had all that garbage going on. And they were going to fix it, and they had a model, as all economists do, and then I said, "Okay guys, I'm going to do my session." And what I said is, "Okay, everybody in the room"...and it was a...like...almost the same number of people in the room here.

You guys are group A. B, C, and D.

A is America, C is China, B is bureaucrats, and D is the other people. You've got to break it down...bring it to the people.

So we've got these 4 groups, and at the end I ended up moving you guys together to make them one group. The bureaucrats were supposed to figure out numbers. We started this thing with no numbers. These guys are looking at, you know, per capita emissions and stuff like that. We needed data. And the other people were all the rest of the people on the planet. Clearly, this is the G2 type of negotiation.

So what I said is...America and China...your job is to negotiate a climate change agreement. There are no rules. GO! And that's...

America was like, "Okay. What we want to do is we want...we will give you access to technology. We want you to shut down the coal plant, we want free trade, we want access to your markets.

The Chinese are like...you have to pay us a lot of money, and we want...we don't want to devalue our currency, and they're going back and forth and back and forth. And if there's no

rules, and there's no time limit, and you have a bilateral monopoly (you guys remember that concept? A bilateral monopoly?)...they both have market power.

Where does the equilibrium in a bilateral monopoly? Can you predict that ahead of time? Do you remember that? Is that a yes or a no? Who thinks that you can predict equilibrium ahead of time in a bilateral monopoly?

Hands up, yes. Hands up, you cannot. Hands up if you're asleep. Come on guys.

Who can predict the equilibrium in a bilateral monopoly? Yes or no? Raise your hand!

Yes. There's 2 yeses. No?

What are you saying? Let's try it again. Everybody put up...both of your hands. All of them up. Put your hands down.

Who thinks yes? In a bilateral monopoly you can predict equilibrium? Yes? Up, up, up!

No? Okay, the no's are right. Thank god. The market.

So they can't get an equilibrium, right? They can't get a negotiation. So after awhile, I said look, "B and D; they get to vote who they like better." They're going to have a democratic vote. And...America, you make your proposal, and China, you make your proposal, and the world's best game theorists were in the room. And they knew exactly how to write that proposal. Who knows what they did? I'll take three suggestions, game theorists. Come on.

I'll take with one suggestion, damn it. How do you convince the rest of the world to go with your idea.

*Pay them?*

Pay them.

America went to the rest of the world and said, "We'll pay you \$10 trillion to accept what we want." And they're like, "Yup." That was it, right? There's no analysis, there was no negotiation, no binding treaties...there's no bureaucracy, there's no monitoring, there's no cap... whatever the hell it was. Just give us money; we don't care what you do with the planet. That was the world's best in the room negotiating climate change.

And in Copenhagen, I think it's going to be worse. I don't even think they're going to offer money. There'll be nothing that happens. That was a little bit depressing, but it was much more realistic, right?

*Where was this?*

Sorry?

*Where did this happen?*

This was at MSRI on campus during the summer.

*Do you think the political regime in China will have...we can't really hold the government accountable...*

I think the political regime in China has been really interesting. They...I mean the party is... number one job is to stay in power. And they're not being dumb about it. The party in Burma is being dumb about it. The Russians were dumb about it, or the USSR.

The Chinese party's like...whoa...they're going to management and leadership conferences figuring how to like...stay one step ahead of demand for people's consumptions (stuff like that). So they have a very strong incentive to stay in power. They have like...whatever it is...15 or 50 thousand protests per year, but they actually log, for some reason.

So besides the minority problems, which are...as far as most of the party's concerned...small. The government is doing a reasonably good job of delivering the goods, and kind of like trying to surf the wave of freedom. As far as I'm concerned, China's going to...the economic development is going to go first, and political development will happen after as soon as people start feeling like...as soon as they get there...you know that Maslov's Pyramid...as soon as they get the basic needs taken care of...I've got my food, I've got my house, I've got my car...whoa, I want to talk now. Can I talk? That's when it will happen. But anyway, the party's got big incentives.

Okay.

I'm going to go over the briefings right now. I'll get to these other things, but I just want to make feedback on that, and then Fei and I are going to hand them back.

The good news is the briefings were pretty good. I didn't read them all, of course. You guys are reading each other's.

I'm going to go over 7 of them that gave me good ideas that I want to promote. Not steal, as somebody noted. They will be promoted with your name.

First thing's first. Next week when you hand in the briefings, this is what you have...

Don't do what some people did. Do not go on two pages...I saw there's one person that went on two pages. They got nailed by the graders. Congratulations; they should've.

Put your own SID on the sheet. Don't put a random number. We had to look up SIDs on some people. They got points taken off because I don't need the extra work. And on the briefing...if you didn't put a summary on it, you got knocked down, as far as I'm concerned. When you were doing the grading, and you didn't put a summary at the top? You lost a point.

Do what we ask you to do if you want to have your points.

So, when you bring it in next week, it's going to be the same game. Three copies, three times. And your name. That's the easy thing. You can do that, right? Okay. So bring that in; we're going to redistribute it at the end of class like we did last time. It's going to be a mess, I'm sorry, but it's really very good.

You guys each had...you graded 3 people, you had 3 people grading you. You got lots of feedback, and hopefully it's helpful, in terms of learning.

And as I mentioned, learning and grades don't always go together.

I know that's annoying, but the world is not fair. The seven that I like, for example, 7.3, 5.7, 8.0, 8.3, 9.0, 10, and a 7.3. I didn't just choose 10s and said...ooh, I like those. But some of your peers would've graded different ways.

Some of the peer grading sucked, and I am not going to question it. So the first thing is...if your peers gave you a silver or a bronze, or whatever, I am not going to question that. That is not negotiable. It might not be fair, but neither is life.

I don't think it was a huge disaster since everybody got 5 points out the door no matter what. And I'm sorry if you feel like it was unfair, but it was random. It wasn't someone choosing you to be unfair to you.

So that's a note about grading. As far as I was concerned, the vast majority of what I read would've gotten less than 5 points. You're lucky I didn't grade you. The average would have been 4 or 3. As you know, the average was 7 because the vast majority of you didn't answer the question.

The question was: propose an economic or environmental program that will make everybody better off and it may harm special interests, and you've got to get reelected as a politician. You are writing a briefing for a politician. There's so many people that had...the worst ones were the ones that read me back the question. A very nice, one page essay of my question. Well...we have to take special interests into account because we want to make everybody better off, and sometimes there's tricky things because you have to get reelected...I'm like...is there anything here? Some of those people actually got 10s by their peer graders.

The second worst thing to do is to write down your favorite proposal. I really think that everybody should have a chicken in their backyard because it's a great idea. And that's why we should have a law about chickens in the backyard.

Disaster. It's not a disaster. It doesn't get to the political problem. If you're trying to implement this...is there a special interest group? Identify them.

What are they going to fight against? How do you counter that? How do you do some kind of judo on a special interest group?

Another one: people sitting there saying I think it's a great idea to have emissions testing on cars because of smog. That'll be brilliant. If we implemented that in California...like we did in 1980?

People were like reciting history as if that's a new program. I was like...good idea; it already happened.

The exception to this, which I thought was entertaining, and quite good, was...some people... they said, "This existing program sucks; we should end it and make people better off."

That was allowed. You had to come up with something new. Don't tell me something that already works. We already know that.

Let's all be nice to each other. Let's be green; it's good. Let's be happy. Those kinds of policies were not policies. I told you: you are not allowed to evolve society. Over 12 generations, my policy will make sense. No, that is not a policy.

Win-win-win-win-win. My policy is a win-win-win-win-win. If it's a win-win-win-win-win, why didn't it already happen?

Are you not doing careful analysis? Have you missed somebody? Because there's a loser somewhere. If it's so obvious, it should've been done already.

We just make a law about this, and we have a regulation about that, and that'll fix that, and that'll be the end of that. We'll have a law that we'll all be nice to each other.

You have to think about conflict rules sometimes. You have to think...if we're going to have a seatbelt law, what if people don't put on their seatbelt? We'll have a fine. Well, who's going to do the fine? Well, there's a cop. Well, what if the cop's eating donuts? Well...

You have to think it through. Sit there and think through all the ways of breaking your own idea. And some people...I know it's only a page. But you sit there and you think about it, and then you write down. You don't have to write down the whole thought process. You say, "Oh, and by the way, to get the donut eating out to give you the ticket, you give a cop, whatever...half the bounty for every unseat belted person."

Oh, but when the cop makes it up, and then you're trying to catch people who really have seatbelts on...well then you have to have a camera on the...

You can do that; it's okay. You give a one page summary. There was a lot of critical thinking going on...and obviously you guys are putting pen to paper. And by the way, in the next week when you're writing briefing two, hopefully, this kind of advice will be helpful. You'll take that into account. As you all know, you are going to be grading each other. There won't be me.

So when you're grading, also keep these things in mind.

All we have to do is educate people. No. That is not a solution. Education as a solution is not a solution. There's lots of educated people out there screwing up the world right now. They have good...

In fact economists are quite good at it. A PhD in screwing up the world. Look at the financial meltdown on Wall Street. Some of the smartest people on the planet have fucked over the financial system in order to take home their \$10 million bonus at a cost of \$100 million or a billion dollars to a taxpayer. Education is not a solution. Let's be good...I said that already.

Subsidies are very tough. If you wanted...a lot of people are like...all we have to do is tax this and subsidize this...where does that money come from? What's the opportunity cost? If we just subsidize solar panels, that'll fix it. Well, yeah, maybe?

But that money has to come from somewhere else. You have a limited budget called your taxpayer's pockets. Let's subsidize a certain...

There were some people that were like...all we have to do is to give more money to the such and such a coal industry. I'm like...okay...yeah, you'll get that passed, but you just helped a special interest. Your job is not to help a special interest. That's easy. Your job is to help society. Potentially at a cost of special interests.

We'll just tell people and make a law, and they'll change their behavior. There's plenty of people that...who doesn't speed? Who never have speeded against the speed limit? 25 zone? 35 zone? 45 zone? You ride a bike, right? No. 65? So 99% of people speed. It's against the law, and yet, they break it. Do not just say: we make a law, and that will fix it. Remember that enforcement matters.

Don't make up numbers. Don't say that there will be a vast benefit, or huge savings, or trillions...someone put trillions in there? I mean...you can have trillions of something, but that was like off by several orders of magnitude. If you're doing a cost benefit, and you assume at trillion dollars of benefit, then yes, that helps, right? But you can't just assume high numbers.

Alright, so let me tell you some of the ones that I liked, just briefly. I'm putting the 4 digits up, so the people that are in the class can feel a little bit appraised, even if their grade did not reflect what they wanted...

One person that talked about using feed-in tariffs—the idea that you would pay home owners to push energy back in the grid...and that would encourage solar panels, or whatever. That's an old idea...good, but an old idea.

Another one—expand the market. Let's have cap and trade inside of California. We can include Mexico and the developing world. That's another old idea. A good one, but an old idea.

There was one that I liked, or I thought I liked...yeah. Moving the...putting the carbon tax on and rebating it against income tax. That was a good idea, in a sense, that it was...if you're looking for democratic and you're looking for votes, then helping the majority of people in terms of a tax rebate and taxing...and soaking the rich is a good idea.

It's difficult, as you know. I mean...Obama's promising to fix health care by taxing the rich, and we see where that's going. But it's a good idea to shift it to Carbon. If you're going for a vote—not a bad idea.

I really...one that stuck out was...let's tax the polluter...above average polluters and we'll rebate cash back to below average polluters. That changes...it's the same idea. If you just have cap and trade...it's the same idea as cap and trade, which is that if you are...if you're using less than 500 tons, you're going to make money.

But it's an explicit...kind of guaranteed return on below average pollution. That was a good idea. 3025 is your last four. And 2820 was the one who said let's move carbon taxes.

Let's outsource the selling of the program to scientists—I thought that was quite good. take it out of political hands...this has been done a lot in terms of blue ribbon panels.

But there's something to work with there that I'm going to look more in to. Essentially, putting the power with technocrats instead of congressional staffers. That was 3489.

Branding, I thought was quite good in terms of a consciousness raising idea. 3706. So the government will call it...I mean...Singapore's recycled water? Toilet water? You know what they call it? How they brand it? Anybody from Singapore?

You can buy it from the bottle. Clarified toilet water. People drink it in Singapore. And they take it to water conferences. They're very popular. So branding. Good idea.

There was an open land initiative...4487...taxing...it was interesting because it was a time shifting situation. You would tax local property owners in order to buy a piece of land that would increase the values of their properties.

That's kind of shifting income. I tax you now; you get the benefit later. Very good address of special interests—the construction companies were also in there, and they would benefit because their property would be worth more money.

That was...it was not exactly a win-win-win because there was a bit of time shifting going on, but it was a good idea.

6107. Environmental direct democracy. This was also...environmental justice...that was quite good. The idea that you would bring in the local community in terms of voting and empowerment and networking. The biggest problem in environmental programs is getting people to sit around in the church and talk about the environment and make a move. I thought that was a very good idea.

And the last one is let voters decide water prices. 8300. That actually...I never even thought of it. It's a good idea. Because voters...they're always bitching about water prices going up, but if they actually vote on it, and they decide where to set water prices, then that could end up working out in terms of kind of soak the rich. Or soak the soakers, I guess. So those are some good ideas and some feedback. I want to hand these back now. So let's do this.

**Transcribed and checked for accuracy by Brynna Bunnag**