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**RICHARD SCHMALENSSEE:**

I want to say a little bit about Hexion to relate to where we are today and then do biodiesel, which is a great case. Obviously if Darren were making his own decision, if Darren were the CEO or Darren owned the company, then his decision to use combined heat and power to generate would reflect his preferences, whatever they happen to be. And if Darren was consistent over time, you could predict Darren's decisions from his past decisions.

But it's a committee. And the case doesn't go into-- in my modification, the case didn't really go into who was on that committee and who the doubters are. But it's clear he had to get by a group of people.

And there's no guarantee that a group of people is consistent. They had different questions. You could read into those questions different preferences about downtime, different worries about bonuses.

You couldn't really tell-- again, you'd have to have a lot more than the questions they asked or the objections they posed to predict what the decision would be. It sounds like Darren would have just run the spreadsheet and done it. But others, who knows?

The terms that Cohen, March, & Olson use, this is a group with problematic preferences. And groups have problematic preferences. There's no reason in principle why groups are consistent in making decisions. You may recall we did this voting paradox thing some time ago where if I have preferences arranged correctly, I can get any decision I want by deciding which pairs you consider first.

So there's no reason that a group would be consistent. And in fact, if you think about just that committee, you'd like to know who shows up, you'd like to know what arguments are made, you'd like to know who's prepared, you'd like to know what other items are on the agenda.

If you've been in committees, you know how this works. Sometimes somebody will lose an argument. And to keep that person on board, they get to win the next one, et cetera, et cetera.

So Cohen, March, and Olsen talk about problematic preferences in organized anarchies like universities. The only point I want to make here is that if you think about Hexion, and you think about Darren trying to get this project approved through some kind of committee, that story holds-- who shows up, what are they interested in, what are their motivations, how prepared are they, what other issues are up that day.

You can't assume consistency, and you may not be able to predict decisions. So we're going to see some of this, and we're going to see some other features. We'll see this, and we'll also see some other things in biodiesel which has to do with a more complicated and presumably anarchic organization-- us.

So the story you all know, a student-led group, simple goal, you take the used cooking oil and convert it into diesel fuel to replace the diesel-- save the reprocessing cost and use it in tech shuttles, other equipment. Lots of diesel engines around campus.

I assume you've all read the case. There is a short video that's actually-- if I can get it to work, it's sort of a nice description told by the participants. And I'm going to refer back to this.

[VIDEO PLAYBACK]

- Animal, so animal weight.

- The whole biodiesel from used vegetable oil is definitely a good idea because it reduces waste as well as creates a useful product.

- Biodiesel MIT, the student-run organization that's been working to get a biodiesel processor installed on campus is going to take the used vegetable oil from campus dining from fryolators and all that kind of stuff and convert it into fuel for the tech shuttles on campus.

**RICHARD SCHMALEENSEE:**

This was made in 2010, this video.

- So the smell of French fries [INAUDIBLE].

- I got involved because I heard about biodiesel. I was working in renewable energy.

- I heard they were looking for someone to do some testing.

- When I got here as a freshman, I was really looking for some sort of energy and [INAUDIBLE] environmental initiative.

- I joined the group actually as the website manager.

- They needed me to find them help. So, I figured I have the skill set to help with the project.

- I tried from the beginning to say this is not a research problem. It is an implementation problem.

[CLASSICAL MUSIC PLAYING]

- The group had been told, if you get funding, it'll be easier.

- The project's going to pay for itself within a year.

- We also wrote up a proposal for the mtvU GE Eco-imagination Challenge. The charismatic view from mtvU came in first. And they had balloons, they had this giant check. I had to go take a math test after that. The administration had theoretically supported the project.

- You can parallel this as people in a community going to government and saying, we have the solution. We just need a place for it, and maybe incentives, economic incentive.

- I really didn't think it would take that much time because the group had just won \$25,000.

- But we had no experience with implementation. We have no experience in policy.

- We still didn't have space. We still didn't have a processor. There wasn't really anything tangible that people could see. So we lost a lot of, I guess, recognition and student support.

- We had the technical problem solved, so we thought everything else was easy. This experience actually taught me that it's actually the other way around. So even if you have the technology, if it's not going to be implemented by the government or the administration, nothing's going to happen.

- So we got to a point at the very end of the Spring semester in 2008 where the administrative organization that had been helping us look for space basically just said our least expensive may turn out like \$160,000 in renovation. This is really just infeasible. We're going to stop looking for space for you. And I'm sorry, we can help you. So we agreed that we would terminate the group.

- We came to a conclusion after a lot of struggling, especially because it seemed at the point that all the effort was wasted.

- There's actually, like immediately calling that, a huge student uprising of support. Three or four days later, we get a call from the Kennedy [INAUDIBLE]. And practically Facilities was all like, hey, we can get back again. We found you space this time.

This is Biodiesel@MIT's biodiesel processor.

- Being part of the group has helped me realize how important the politics of it all can be.

- I'm so convinced that the policy is more important.

- It's just pushed me to a minor in policy.

- Putting different groups of people together always produced pretty good results.

- There have to be first members.

- Even if you have a good idea, it doesn't really matter if you have to change the way people do things.

- But after Biodiesel@MIT, I know that people will be able to do things like this much more easily.

[MUSIC PLAYING]

[END PLAYBACK]

**RICHARD SCHMALENSEE:**

OK. The group's website doesn't seem to have been touched since last summer, so I don't know what its current status is. But they did manage to produce fuel. So I'll just run lightly through the history because I want to spend some time on the discussion.

Did that raise any questions vis-a-vis the case, by the way? Is that pretty clear? The first time we taught this case, Sara presented it, so nice to see her again.

So they talked to the administration and they were told, if you have dollars and space, why, that's great. They won this award, they looked for space from the fall of 2007 through the spring of 2008, they gave up, space was found, and they installed the process.

So they actually did produce fuel. And at least according to the website, it's in use, or was in use, at least as of last summer. So there it is. It's a nice project if you think about it.

From the MIT point of view, it's got some research. Somebody had to do the cost analysis. They had to get this stuff tested. They had to get the system work. They had to design the logistics, a lot of interesting things, good photos. It comes out a little murky you will see, but it can be made usable.

But it took a long time. And you got the frustration in that video. And I hope you got the frustration in the case. A project that seemed like such a good thing, and the case goes on, it saves energy, it's clean burning, it's swell, it took a long time.

So I want to talk about, and we will talk at some length about why that happened because I think this really is a good case in terms of what it takes to make organizations change, that's what this is about, and why they don't.

So the conventional explanation, and you could see it in Sara's face was, gee, if only you'd been a better leader, if only, if only, if only. The whole Women in Science Initiative here a few years ago really did have a big impact, really did change things. How come that worked? How come that went off right away and this didn't?

The alternative might be that there was something about the organization. And it wasn't a matter of better or worse leadership. It was a matter of strategy running up against organizational problems.

So I think there are more things in the story. What we got in the case, and what you get in the video, is they tried real hard, they gave up, and then suddenly the space was found. And it's got to be more complicated than that. So we think-- I think context is really important. So let's walk through a little bit of this.

So in the video, Sara talks about "and we talk to the administration and the administration was supportive." And you hear, that, you hear people talk about large organizations in the singular a lot. BP does this, Goldman Sachs does that. The administration does one thing and another.

Well, it's not a black box. It's a set of people. That's just the top set. That's the top layer.

And there are rules. That shows reporting relationships, who reports up through the provost, who reports up through the chancellor, who reports up through the executive vice president and treasurer, a little dotted line responsibility here from Israel, a Sloan graduate. She's a Sloan graduate, but never mind.

If you look at MIT, there's a formal hierarchy. I'll show you some more organization charts. People report to people, particularly outside the faculty realm, particularly in the staff side of the operation, which is what they were largely dealing with. They're specialized responsibilities. Different people have different jobs, different things they're judged on.

And they're a set of rules, formal, informal, but mostly formal rules and procedures about how we do things. You can go on the MIT website, and you can get the rules and regulations of the faculty. You can get a document called Policies and Procedures that lays out a lot. In various other places, there are sets of rules deep into organizations.

I mean, it's a bureaucracy. That's not-- that's a technical term, an organization that has all of those things. Most large organizations have to be bureaucracies to get things done.

You got to have hierarchies and reporting responsibilities, and you've got to divide responsibility, and you've got to have some rules for how we do stuff. That makes for efficiency. It doesn't make for change.

There are also a set of informal rules. Who votes with whom? Who talks to whom? Who supports whom? What are the communication channels in this complicated entity?

So, whenever you think about changing an organization or about how an organization behaves, you got to think about it in the plural. It's a set of people, it's a set of relationships, it's a set of rules, a set of responsibilities. And here are-- oh, yeah, let's go to the next one.

So this is a description-- I'm not quite sure where it's from-- of what Biodiesel@MIT does. They work with-- they have to work with Campus Dining, Facilities, Environmental Health and Safety, MBP Bioenergy, I think, was the reactor supplier, and the Energy Initiative. And it's designed to do some training and to make biodiesel.

That's sort of where this organization has to be situated, has to get space, has to pass Environmental Health and Safety because things can go wrong with the reaction. And you've got a lot of material around. The Energy Initiative, not so clear. Health and Safety, yeah. Campus Dining to get the fuel. Lots of places.

Who was the most troublesome from the case? What parts? Max.

**MAX:**

--trying to find them space.

**RICHARD SCHMALENSEE:**

That was the CRSP, the Committee for Review of Space Planning. Anybody else troublesome? Scott.

**SCOTT:**

Also the Health and Safety, it was a lot of different back and forth.

**RICHARD SCHMALENSEE:**

Health and Safety. Anybody else? Yeah.

**AUDIENCE:**

They said something about the janitorial service.

**RICHARD SCHMALENSEE:**

That's facilities basically, yup.

**AUDIENCE:**

And there were members that were in class familiar with isolating systems.

**RICHARD SCHMALENSEE:**

OK. Let's unpack it a little bit. Let's see, Facilities and Environmental Health and Safety report up through the executive vice president and treasurer. We can see them there. This unpacks the organization from the website. There's Facilities, there's the Environmental Health and Safety reporting up through the executive vice president and treasurer.

What are their day jobs? What's Environmental Health and Safety's day job? What are they mostly concerned with? They don't exist to provide space for student activities. What do they exist to do? Jacob.

**JACOB:**

I know they do a lot of safety training for people for different labs and students who are working [INAUDIBLE].

**RICHARD SCHMALENSEE:**

So their job is to prevent accidents, and incidents, and hazards. They do training. They also work with people to make sure they're in compliance with a variety of regulations and try to instill best practices to make the place safe. They want to reduce risk. They want to reduce risk.

What about Facilities? What's its main job? What's its day job? Again-- yeah, Columbus.

**COLUMBUS:**

To make sure that the physical buildings are operating correctly.

**RICHARD SCHMALEENSEE:**

That the physical plant runs, that it's clean, that it's warm when it needs to be warm, that it's cool when it needs to be cool, that the plumbing works, the electricity works, things are clean and landscaped and all that. They're concerned with the physical plant, keeping it going.

OK, CRSP, CRSP is a more complicated story. Sorry, that's the acronym. The space planners are a more complicated story. But just to give you a sense, here's-- what do I have first? Here's Facilities.

So Facilities-- I don't have people down there. But there are people in all these boxes. That's what Facilities looks like, worrying about the utilities, worrying about security, janitorial services, grounds, making sure the mail gets delivered, and a whole lot of overhead. That's the planning, building new construction, renovation, and so forth. A fairly complicated organization, not unusually complicated for an institution this size, but fairly complicated.

And lots of people. And everybody's got a job. Whoever these folks are, they worry about getting the mail delivered. And these folks worry about the grounds and landscaping. That's their job. That's how they're evaluated. And you don't see a provide lab space for students. Not their job.

Environmental Health and Safety-- you have to have an MIT certificate to get this org chart, which I don't quite understand. But I had to type in a bunch of credentials twice to get it. But there's Environmental Health and Safety.

You got folks worried about the reactor, a variety of other responsibilities, some technicians out here. A whole set of people concerned with minimizing risk. So these are simple, focused organizations.

So when Sara talks about "the administration," we talked to the administration, the first question is, who, who did you talk to? What was that person's role in the hierarchy? What was their responsibility? What rules were they operating under? And how are they judged?

Now, let me come to the really interesting one. This is CRSP. I have to tell you in nine years as dean, I never actually knew who was all on CRSP. But CRSP was like one of-- I can't remember whether it was a Carter advisor or a Clinton advisor who said, when I die, I want to come back as the bond market because everybody's afraid of the bond market. Well, I'd like to come back as CRSP because everybody's afraid of CRSP.

At MIT, space isn't priced. Departments, labs, don't rent space. Space is allocated. But space is a status symbol.

If you're running a lab, you want to have a lot of space because that means you're active, you're busy. I mean, those of us who work at our desks, we're out of this game. But in most of MIT, space is a status symbol, and CRSP allocates space.

CRSP is a nice illustration, its processes, of the garbage can model. First, CRSP deals with proposed solutions. And this is a characteristic of lots of entities and lots of organizations.

How can Congress, when it decides to actually do something, get legislation written in a hurry? Because somebody's drafted it, somebody's got the answer. They're just waiting for the right question, just waiting for the right question.

Some years ago when Rush was moved from September to later in the year, that was a proposal acted on. There was no problem definition from which that emerged as the optimal solution. This is a very standard mode of operation of organizations. There are solutions.

If you want to actually think about another university example, many colleges and universities around the country have abolished their Greek systems over time. Was that the optimal solution to a carefully defined problem? No, it was a solution that people put forward, a proposal that people put forward that was evaluated.

So CRSP acts only on proposed solutions, only on "I need to do this with this space because," not-- and you can see why. You can't sit down-- they process many requests with great regularity. Particularly this renovations subcommittee, which is what's at interest here, meets twice a month, every other week, and processes dozens of requests of various sizes, dozens of requests.

You can't say, is this the absolute best way to meet this need? It's like, is this OK? Does this work? Can we do this?

Fluid participation was a characteristic of the garbage can model. Well, look at all those people. Does everybody come to every meeting? Probably not.

Is everybody thoroughly prepared on every issue? Probably not. Does everybody care passionately about every issue? Probably not. And everybody's got, with one or two exceptions, has got a day job, has got a day job.

So, exactly who's active in making a decision is going to vary. It's going to vary. So if you want to affect it-- if you want to affect a decision, you'd like to make sure that there's somebody in the room on your side when the decision is made.

You don't just-- and this is how you deal with Congress, right? You don't just make a great proposal to Congress. You go talk to people. You go talk to people on the committee, and you say, here's why this is important. OK, fluid participation. Who makes the decision varies.

Problematic preferences. We know CRSP is not consistent over time. We know it from the case. We know it from life. The case illustrates it nicely. Can't find you space, it's going to cost \$160,000, boom, here it is, we found it. A miracle. A miracle.

The other thing, unclear technology. By "technology" they mean the decision-making process. And if you say to somebody, well, how come this project got approved and this project didn't, you will hear the argument that was made for or against. That's not necessarily why. That's the argument that rationalizes the decision.

In any group like this, particularly when the objectives aren't clear-- x wants \$20,000 to renovate the lab. Is that a good deal or a bad deal? Well, it's not like we're trying to maximize profit here.

We're trying to-- who knows, MIT has a complicated set of objectives involving research and education. But almost everything that's proposed will contribute to research and education. So which ones can you fund?

Well, exactly how those choices get made is obscure. It has to be obscure. If you ask the people to describe it, it would be obscure. That's a lot of people in a room dealing with a lot of information, again, not atypical.

So when Daniel says, well it's politics, well, yeah, but that doesn't help you figure out what to do. It's politics in the sense that there are people making a decision for other people. So in a very broad sense, I use politics-- at the start of the semester, it's politics. It's a collective decision.

But if you wanted to do a better job, you would want to do more than treat the administration as a black box. And you would want to do more than say, well, what goes on in here is politics. Yeah, OK, what kind of politics? Who? Why? What interests are people serving?

So this is the background. I want to spend some time, and a good deal of time if we can, on what happened, what happened and why? Why did it take so long?

Was this a bad project? Is this project inconsistent with the kinds of stuff MIT tries to do? You're shaking your head, David. Not inconsistent. Good values.

[INAUDIBLE] President Hockfield at that point of time had stressed the MITEI initiative.

**DAVID:**

**RICHARD SCHMALENSSEE:**

Yeah. And they have 50 faculty members, MITEI support. This I think is the key question. How come 50 faculty members, MITEI support, consistency with MIT values didn't move this thing off the dime for all that time? Andrew.

**ANDREW:**

Because everybody's not responsible for actually making the decisions. Ultimately they first saw the [INAUDIBLE] concern.

**RICHARD SCHMALENSSEE:**

OK.

**ANDREW:**

It falls to their responsibility to change [INAUDIBLE].

**RICHARD SCHMALENSSEE:**

So all those supporters didn't have the power to move it. Point. Sam.

**SAM:**

I think just the biggest issue is the back end. What the group planned to do, it'd affect so many different operations. They would need to get the Dining Hall on their side, Facilities to help them move the grease. They'd need to get the OK from Facilities to actually use the biodiesel in their vehicles.

They need to get the space from the administration. So it just encompasses so many different areas. And that's like five or six different like sub-bureaucracies you have to deal with.

**RICHARD SCHMALENSSEE:**

But you didn't hear the Dining Hall objecting. The main objection-- the main objection was between Facilities, and Environmental Health and Safety, and space.

**SAM:**

Well, they did have most at stake. All the Dining had to do is say, OK, we'll leave our grease on this back porch. And Facilities, they had to be the one to move it, bring it over to wherever the space was, pick up the finished biodiesel, figure out how they're actually going to put it in the shuttle. I mean, it's the most work for them. So that explains why they were most hesitant.

**RICHARD SCHMALENSSEE:**

Well, explain why, because this is consistent with MIT values thing, and it's a good MIT thing. And the students probably would have volunteered to handle the legwork of moving it. I don't think we're talking that much bulk.

Blending it is going to be an issue. But blending is blending. You could probably do it simply enough.

But then you notice all of a sudden [SNAP OF FINGERS] it happened. All of a sudden they got the space, the reactor was bought, and they were moving forward. So what you're saying was Facilities resisted. Why? What was it to Facilities-- well, go ahead.

**SAM:**

I mean like in Facilities [INAUDIBLE] was like changing people's responsibilities, which I think people, like it you've been a role for a while, and you're comfortable with that job, somebody says, oh, we're going to have to implement this completely new system, we're going to balk.

**RICHARD SCHMALENSEE:** OK. So for Facilities they added to their day job. Christopher.

**CHRISTOPHER:** I mean, I think you have to define support, too. I think any faculty member would be willing to say, hey, that's a great idea. But is it worth it to them to actually go out and do something about it? Like for Facilities, to get their support, it has to be worth their time and their money.

**RICHARD SCHMALENSEE:** So there has to be something in it for them because they have the ability to block, don't they?

**CHRISTOPHER:** Yeah. Like if there was a Professor that had a research interest and vested in this, then he might be more willing to try and find some space or vouch for them with CRSP or something like that.

**RICHARD SCHMALENSEE:** Well that actually comes to the next one. What kind of entity is this? It wasn't a professor's lab, was it? It wasn't a live-in group, it wasn't an administrative unit, it wasn't a department. What kind of creature was it? You had your hand up, Alexandra.

**ALEXANDRA:** Oh, I was going-- can I say something?

**RICHARD SCHMALENSEE:** Yeah, of course.

**ALEXANDRA:** So-- wait. [INAUDIBLE].

**RICHARD SCHMALENSEE:** Hold that thought. I'll go with Julian. I'm sorry.

**JULIAN:** It's a student organization, right?

**RICHARD SCHMALENSEE:** It's a student organization. But most student organizations don't handle potentially flammable equipment that could do various kinds of damage, don't take up-- don't need to interact-- it's a student organization, but it's kind of different.

**JULIAN:** It is a different student organization. So because of that, you have to take into account like practicality, where are they going to get space? It's not like they think they're going to Walker Memorial and whatnot.

Also, most student organizations don't actually have a space of their own. So it's kind of a zero sum game. Everyone's fighting over equal space.

**RICHARD SCHMALENSEE:** Yeah.

**JULIAN:** And not everyone is moving out of your space. And, of course, MIT-- it's highly sought over to have space at MIT. So, I mean, realistically they're not going to be able to move in until someone else moves out.

**RICHARD SCHMALENSEE:** Or unless CRSP decides they're very important because faculty members expand their labs all the time. And space is zero sum. Logan.

**LOGAN:**

I would say that a lot of the difficulty stems from the fact that it's spanned across a lot of different types of organizations. And there are [INAUDIBLE] is everyone listed up there, including some others, like transportation and stuff like that.

**RICHARD SCHMALENSEE:**

Alexandra, good to go? OK.

**ALEXANDRA:**

What I was going to say is like, the fact that, as he said, spans across so many different departments, as well as a lot of those departments, their goal is not necessarily to make biodiesel work. So maybe it works with MIT's general idea, but Facilities wants to maintain buildings. So add-- the MIT@Biodiesel group probably adds to their responsibilities.

And also now the space group has to talk about this. And maybe they don't actually want to spend time if like no one really cares. So probably it seems to me what happened was maybe the student group wasn't pushing hard enough for it or didn't know how you go about talking to people. And then they quit, and then everyone else was like, oh my gosh, don't quit! And then--

**RICHARD SCHMALENSEE:**

But we're going to come to that because that's a very important part of the story. I don't know who was first here, Ryan? We'll get all three of you.

**RYAN:**

I was the last one. But--

**RICHARD SCHMALENSEE:**

Well, that's not fair. Erica. No, go ahead.

**RYAN:**

Well, I was just going to say that I think that part of the problem was that MIT and many other places just made the bureaucracy too complicated. Instead of actually deciding on to do anything, they usually have a meeting to decide a committee to decide something. So I would say that the reason it didn't get through was partially their fault because they didn't know who to go to, but it's also partially the fault that bureaucracy has evolved into this monster that's hard to get through.

**RICHARD SCHMALENSEE:**

Well-- but to be fair, this is not some kind of terrible thing. And it's not, compared to other universities, particularly bureaucratic. It's that if you want to run a place this complicated, you have to have a hierarchy, and a division of authority, and a set of rules.

Everybody's got a Facilities department. Everybody's got Environmental Health and Safety. Everybody has to have a process for assigning space. So those three entities have to exist in some form.

So I wouldn't say MIT's an example of out-of-control bureaucracy. It seems like that occasionally when I try to get something done. But looked at objectively, I don't think-- it's really good at doing, it's not good at changing. That's the way all these are. Steven.

**STEVEN:**

Well, the first thing I was going to comment on was that when you say that the faculty support and values weren't sufficient, it's not that they weren't sufficient, it's that it's easy to gain support from people and bodies that don't necessarily have to make the sacrifices in order to implement those types of changes. So that way with the Facilities and the Health and Safety groups, they actually have to sacrifice other groups and other possible issues in order to take care of this initiative.

And also the fact about space, I don't know a lot about CRSP, but I know with certain other organizations when they're assigning spaces, they'll do it at a specific point once every year, that way they review all the different allocations of spacing, whether it be rooms in the Student Center or other places on campus and say, all right, you can use this space, or this group is getting this space now. So I'm not sure if maybe CRSP, for instance, says like at the beginning of the year they can re-assign different lab spaces, different locations for other groups as well.

**RICHARD SCHMALENSEE:**

No, they operate more flexibly than that. Renovations-- that renovations committee met every two weeks, and the body itself met monthly. So if you're going to put in a big request, like we want to build this building, it may go through CRSP, but it ultimately goes to the president.

But for medium-sized things, they get decided on a pretty regular cycle because you don't want to wait a year. You have a big-- you've got a big grant, it requires you to install some equipment, you don't want to sit around and wait for a year to get the project going. So it operates pretty regularly. Erica. You were probably first, huh?

**STEVEN:**

Yeah.

**ERICA:**

I think there's a lot of, like, instability, I guess in the process or uncertainty because I think when they first got the GE Eco-imagination grant, and they are thinking, oh, it's going to take \$35,000 I think was the number--

**RICHARD SCHMALENSEE:**

Something like that.

**ERICA:**

--and it ballooned up to \$137,000 and came back down to like--

**RICHARD SCHMALENSEE:**

Came back down. Isn't that a miracle? Yeah.

**ERICA:**

But all the costs that piled up, this was not only like, oh, it's a big cost. Now it's also an indication that they didn't realize how far things were going to go. And so when you think, OK, it's not even what, 35,000, and they think they know what we're doing, and then all these other things start piling up--

**RICHARD SCHMALENSEE:**

Then they get overwhelmed.

**ERICA:** Yeah, overwhelming, and it's harder to support when you don't know what the [INAUDIBLE] is.

**RICHARD SCHMALENSEE:** That's true. That's true. It's hard-- they had faculty support, which a number of people have pointed out, is really pretty cheap and fairly useless for many things. But for this one, where you had to deal with the staff, quite useless. David.

**DAVID:** I was just going to say I think it's important to realize that the people who are in charge of these communities are gatekeepers, not necessarily stakeholders in the project. So for them to say no to something is to minimize their risk because if something doesn't go forward, they're really not on the line for it unless there's public attention drawn to their decision, which is what happened.

And then they had a choice to make. There was we do it and we deal with the consequences, or we don't do it and deal with the consequences, as opposed to doing it and possibly dealing with a fire, or explosion, or something expensive down the line, or not doing it and then it fizzles out and dies and no one knows about it.

**RICHARD SCHMALENSEE:** Well, I want to come back to that. I just do want to make the point here that we've danced around, which is this group doesn't quite fit. You could look at policies and procedures, and it talks about labs, and it talks about the departments, and administrative, units and living groups. And it even might talk about student organizations, but not in a way that deals with this kind of operation. This is a production operation run by students.

You can look through the rules and the precedents, and you don't find any of those. So you're giving the administrative apparatus with its rules, and its hierarchies, and its defined responsibilities, and you're giving it a new kind of creature. David.

**DAVID:** There are lots of student groups that do have hard allocated spaces in [INAUDIBLE]-- there's the [INAUDIBLE] City team and [INAUDIBLE] team and stuff like that. And you do power allocated space with like dangerous machines and stuff where there is risk.

**RICHARD SCHMALENSEE:** Some of those have been around for a long time, of course. This was a new one.

**DAVID:** So maybe it took them five years to get space or 20 years.

**RICHARD SCHMALENSEE:** I also think the Environmental Health and Safety stuff has gotten much more focused in recent years. I think we've all gotten much more risk averse. If you look at something like-- well, I don't know which shops.

I know the ones that used to be when I was here as a student, they'd been around for 50 years when, hey, go ahead play with a drill press. Who cares? So it may just be that there's more scrutiny.

**DAVID:**

There's some sort of precedent that these groups use.

**RICHARD SCHMALENSEE:**

There is. There is. I take your point. But boy, they acted like this was neither fish nor fowl. Charlotte.

**CHARLOTTE:**

I was going to say, I guess, I think that that's the answer right there, that just in today's world, things take longer. I mean, I think it's more impressive that a student group was able to successfully carry out this project, and get approval, and get a space within two years.

And then now, six years later, we're actually producing the product. I think that's really impressive. And I know that two years seems like a long time to a college student, but in the real world, wouldn't a project like this take longer?

**RICHARD SCHMALENSEE:**

It would depend, wouldn't it? I mean, it went real fast once it cleared. So I think part of what we've been saying, and a lot of people have said it, was none of the key players had a positive incentive to take this project forward. It was more work for Facilities, it was more risk for Environmental Health and Safety, it was space from other uses for CRSP. So, Arianna.

**ARIANNA:**

I'm not sure I entirely agree with that. I think there is some kind of incentive as part of [INAUDIBLE] the overall organization if this is accomplished, then it kind of looks good on everyone. But because those-- it's a collective action problem. If not everyone's pulling their weight, and because it's taking all these different groups to pull it off, if someone's lagging, it's a waste of everyone else's time.

**RICHARD SCHMALENSEE:**

But if I'm the Facilities guy, the fact that MIT gets good press doesn't affect my job performance rating, doesn't affect my day-- how well I do my day job, which is what I'm judged on. I'm not judged on MIT's press, I'm not judged on MIT's education, I'm judged on, does the mail get delivered, does the landscape look good?

And if I'm Environmental Health and Safety, I'm judged on accidents. Are there risks? Do we comply? This is not an opportunity for me. This is a challenge for me.

CRSP is more complicated because of its diverse representation. But Facilities and Environmental Health and Safety, this is not an opportunity, this is a challenge. For MIT as a whole, that's a different game.

**ARIANNA:**

I think there's some trickle down of smiling faces.

**RICHARD SCHMALEENSEE:**

But the whole point here is not much, in a large complicated organization, not much. Erica.

**ERICA:**

Well, in this situation, having MIT look better as a whole would just affect the Facilities' and EH&S's jobs. So they needed to be required to implement the [INAUDIBLE] pass as part of their job.

**RICHARD SCHMALEENSEE:**

They could be required to. And in fact, that's probably what happened. But when the process is coming up through them, there's nobody requiring them. Sarah.

**SARAH:**

It raises a question as to the direction of the rules in the hierarchy because it seems like all of the rules we've talked about thus far are about proceeding up the hierarchy. But there aren't checks and rules for going down. So if you brought something like this to President Hockfield, she would have the incentive to move forward with it and force those incentives on the people below her. But it's not able to move on the other direction.

**RICHARD SCHMALEENSEE:**

That's the nature of organizations, right? You go back to Hexion, all these folks concerned about their bonuses with there might be an outage, and it might affect my bonus, and I can't go to Hawaii this year, it may be a great thing for the CEO.

If you can get it on the CEO-- the CEO might say, oh, come on, we want to be leaders, we want to get great press, and the savings are nice. So for the organization as a whole, if not necessarily for you and your bonus, we should do this. But if it doesn't get on that person's desk, it doesn't go down the hierarchy. It doesn't go down. Andrew.

**ANDREW:**

I assume [INAUDIBLE] some points. Somebody brought up one of the points that despite-- because if we talk a little about the administrations and how they interact with each other. But I think that we shouldn't underestimate the importance of the individual people who are in that administration. Like if it happens to be that that went to the registrar's office and one day spoke to person A about the same issue, and then the next day spoke to person B, and they should discover results, simply because they spoke to the right person.

"Right" might be his position, it might be his mood that day. It might be the [INAUDIBLE] who he conferred me to. So I think that-- I mean, some of you [INAUDIBLE] previously that it's not always the administration, per se. It's the actual people inside and not dealing with a black box. And then if you make it his personal goal or something to make sense--

**RICHARD SCHMALEENSEE:**

Well, the registrar is a good example because the registrar's office is student-facing importantly. Facilities is sort of building-facing. Registrar's office is supposed to solve problems for students.

So part of it's temperament and ability. But if you get somebody good, that's their job. It's not the job of the person in Facilities. [INAUDIBLE].

**AUDIENCE:**

I know there are [INAUDIBLE] differences. But you can also argue-- I mean, you got to juxtapose this against, say, maybe MITx, that you may not be dealing with Health and Services and Facilities, but you're dealing with other organizations and so on and so forth.

**RICHARD SCHMALENSEE:**

That have terms.

**AUDIENCE:**

And that went from idea to ground in less than two or three months that we know of.

**RICHARD SCHMALENSEE:**

And it had support from the top. And the Energy Initiative got launched with support from the top. Casey.

**CASEY:**

So this biodiesel effort was a solution. So maybe part of the problem was that there wasn't a saline problem that needed to be addressed within the MIT community. I mean, this group had an idea of what it wanted to accomplish. But maybe just the fact that the rest of the MIT community wasn't so concerned about the fuel usage of transportation that the key players did not have this incentive to address the problem because there wasn't this push.

**RICHARD SCHMALENSEE:**

So, why'd it change so radically? Obina.

**AUDIENCE:**

[INAUDIBLE] to a question. Instead of an incentive, do you think there was a disincentive? Because they're doing the narrative played out. Students had a great idea, they get a lot of press about it, and then they run up against all these roadblocks within the MIT administration.

So it's like, oh, this school project was stalled by MIT itself. Oh, are they doing this? And so suddenly you start looking bad in the eyes of whoever is reading this bad press.

And so maybe they were like, OK, maybe the guys up top intervened, like who's causing the-- who's stalling? EHS, get your act together. And then, I don't know, it accelerated.

**RICHARD SCHMALENSEE:**

Put yourself in President Hockfield's shoes and imagine you're reading *The Tech* on May 13, and you're reading the story. And as Sara told it, that we've been trying all this time, here's what we're going to do, and it's gotten killed. Suddenly you react from the point of view of MIT.

And you talk to the folks in CRSP, and you say, surely we can do this. Surely there has to be a way to do something that has research, and education, and student initiative. And I gather the numbers are OK. It becomes an opportunity, not a threat.

It's a threat to Facilities because it's more work. It's a threat to Environmental Health and Safety because it's got risks, no doubt about it, that

Adds to their problems. It's even a threat to CRSP because it's competing for space, which is really valuable in which people really want. And here are these students-- with all due respect, students-- who want to take space from department heads, and deans, and people like that. So in a way, it's a problem for CRSP as well. You're not going to control much that matters to them.

But for MIT as a whole, it's an opportunity. It's an opportunity to talk about student initiative, and environmental leadership, and lots of great and wonderful-- learning by doing, hands on. It's a great story. It's not a great story for Facilities, or Environmental Health and Safety, or CRSP. But it's a great story for President Hockfield.

I don't know what happened. I don't know whether she called. I'd be kind of surprised if the president or provost hadn't intervened on the basis of that article because CRSP turned on a dime.

The case makes it clear. They turned on a dime from very risk-- and the environmental risks went down, and the space was available, and the remodeling was cheaper-- all of a sudden, all of a sudden. Somebody from the top did something.

What might they have done? I would say when Sara first presented this experience to this class two years ago, she said if we just tried harder, if we just kept after Facilities, if we just kept after the environmental people and talked to folks on CRSP, was at the right play? Yeah.

**AUDIENCE:**

I think they should have realized if it was in the committee, identify who they actually had to talk to because I think their biggest mistake was that they found their values-- they thought their values should be consistent with the committee's values. And it's almost incorrect to say that it's consistent with MIT's values because what we just pointed out is that the undergrad-- that the student body's values are very different to the administration's values. Like Facilities might have their own objectives, Environmental Health and Planning might their own.

So in order for them to have been more effective, I might have made sense if they knew they weren't dealing with a student representative or anyone in there who shared the values of being environmentally friendly with the-- and perhaps that they should have stressed on other points, or had someone else [INAUDIBLE].

**RICHARD SCHMALEENSEE:**

I hadn't thought about this, but the question comes up on CRSP, there isn't anybody there, as you look at them, who has a primary role in education. Claude does research. But either-- this is the current makeup. So I'm not sure who was there then.

Phil Curry was a former dean, so you would talk to Phil. Rafael, faculty member, you'd talk to him. Grimson, faculty member. Everybody else-- well, Claude is a faculty member, but he has research responsibilities.

These are the three people on that committee who have very broad responsibilities. Everybody else is Department of Facilities, Department of Facilities, Finance, Project Management, Planning and Design. In this case, you have to take it up the line. Charlotte.

**CHARLOTTE:**

Well, it also seems that maybe they could have tried taking it to the students initially, like if they'd gotten-- because it seems like what happened in the end was that because the student body cared so much, other people took notice. So maybe they should have gone about getting a petition or having some sort of student body support from that end, which isn't going offline. I say that's going--

**RICHARD SCHMALEENSEE:**

Right. That's starting a social movement, so to speak, getting strong and noisy student support. Yeah, that's another way because, again, the top administration will be sensitive to that, will be sensitive to that. [INAUDIBLE].

**AUDIENCE:**

I feel like if they had gotten more support of what this would solve, if they get support of maybe the transport section, I'm pretty sure even though--

**RICHARD SCHMALEENSEE:**

Transport guys, it's actually a bit of a threat to them, too, because the machinery runs fine, and we're going to change the fuel, and you're telling me it'll still run fine, it'll be environmentally friendly. But from the point of view of cutting the grass and running the shuttles, there's no upside, there's only a downside. From the point of view of running the shuttles and cutting the grass, yeah, it'll be good, we'll feel good, but I'm not judged by my emissions. I'm judged by do the shuttles run on time. So I'd worry about that.

**AUDIENCE:**

Besides that, look at maybe Dining. If Dining sees this as an opportunity to be able to dispose of that oil in a--

**RICHARD SCHMALEENSEE:**

I think that's right.

**AUDIENCE:**

--safer or cheaper way. And even though there's no one here who ensures that as a ten student group get some space, there should be a community that can support Dining if Dining presents that as a need for them.

**RICHARD SCHMALEENSEE:**

So they solve a problem for Dining of getting rid of all this used cooking oil, and you want to stress that. And you'd want to get-- you'd want to get student activism of one kind or another. It sounds like this was a small group that worked very hard and burned out. And that's not the way to do it. Erica.

**ERICA:**

Also I think if-- I'm not sure how they pitched it, I guess, because obviously, there's the whole environmental "do good" side. But if you wanted to get the support of certain groups on campus, like department Facilities or EHS, you'd probably have to change what's-- prioritize what's important to them to make them want to join. So we keep on saying how much work they have to also put into it. But if you found something, I guess, another way to say, like, well, yes, you're putting more work, but you see this aspect that's not only the do good side, I guess.

**RICHARD SCHMALEENSEE:**

I think facilities would be hard. I don't know how you make this a winner for Facilities. Marie, you're with us, right? Any thoughts on how they could have been more effective?

**MARIE:**

I mean, the main thing that I can give you is the thing with Charlotte is if they had gotten the students involved earlier--

**RICHARD SCHMALEENSEE:**

Broadly involved.

**MARIE:**

Broadly involved across campus, maybe-- I mean, instead of having faculty support where they didn't really specify who the faculty were and only faculty in small cases, if they had gotten a broader support system that could really pushed it further out it would have been helpful.

**RICHARD SCHMALEENSEE:**

It might have been interesting just in terms of faculty support, could you get somebody, for instance, to put a petition in a faculty meeting that the MIT faculty endorsed blah, blah, blah, as opposed to we talked to a bunch of guys and they like it?

**MARIE:**

[INAUDIBLE] just pretty broad and you have-- yeah, I guess the course that it covers in chemical engineering, and they have the core six that was doing the website and spanning a lot of different majors, and they could have gotten faculty support in many different categories.

**RICHARD SCHMALEENSEE:**

And even a Sloan MBA running the spreadsheet, huh, to do the cost effectiveness. Max.

**MAX:** I think one of the big problems with this project is that-- that probably led to a lot of hesitancy with CRSP was just putting that much trust in students to deliver this product that MIT relies on or will hopefully rely on. And, I mean, student support, I think, may have had some factor. But I think students are pretty fickle. And there's a big risk that if interest in this project dies out in the future, how can we keep it going? What's the contingency plan for supplying the biodiesel, which maybe-- I didn't read the formal-- I don't think there was the formal report for the proposal--

**RICHARD SCHMALENSEE:** We didn't include it, yeah.

**MAX:** --but if that had in it more of a contingency plan to show that this is sustainable, it's not just going to rely completely student support.

**RICHARD SCHMALENSEE:** If you go to the website-- again, I assume it's still going. But if you go to the website, it's clear that all the excitement was getting it out-- first of all, doing the study, getting approval, getting it up and running, getting the reactor actually to work, getting the fuel tested, dealing with a whole bunch of logistical issues, and then it's a factory. And then it's not so much-- then it's not so interesting. Sam.

**SAM:** Like I think the size getting student support, the other just really key thing to getting anything done is that when you're dealing with a bureaucracy, you always need to work-- you always want to work down the chain of command instead of up. If from the beginning they had gone to the provost, or the chancellor, or even like President Hockfield said, look, we have this really cool project. It saves you money.

But more than that, it's a great-- it fits with MIT's mission statement, it's students taking initiative, it's hands-on learning. And then you can get some of them to-- like a high level person of influence to support it from the beginning, then you kind of--

**RICHARD SCHMALENSEE:** Boom. Then it happens. Then it happens in weeks. Yes.

**AUDIENCE:** Well, I was pretty much was going to say what Sam said.

**RICHARD SCHMALENSEE:** Well, you can just point to him.

**AUDIENCE:** Would it be entirely unreasonable to go and knock on President Hockfield's door? Like her house is right here.

[STUDENTS LAUGH]

**RICHARD SCHMALENSEE:** Well, you have to have some sense of just how insanely busy her life is. And the answer is no. And she's also-- one of her first quotes on taking office was "I don't like surprises."

So no, you want to work through her office to get on her calendar. But that would not be unreasonable. You could take a shot at it.

She probably would push you away. I'm just thinking about operating style. She'd push you down. But she wouldn't push you down to Facilities. She'd push you maybe to the chancellor, or maybe to the dean of engineering, or somebody rather than Facilities.

So it'd be worth a shot. I don't think you'd get in to see her right away. But I think you could get higher up in the organization. Yes.

**AUDIENCE:**

I think playing off the other department to try and get off that set train, getting Dining to make that call could be useful. But playing the devil's advocate, what would have happened if they just did it and then asked for a grant?

**RICHARD SCHMALENSEE:**

They couldn't. They had to have a place to do it.

**AUDIENCE:**

Say if one of the faculty that was supporting them would let them do a shoestring version, and so they could go to Facilities with a couple cans of biodiesel and say, try this out for a week.

**RICHARD SCHMALENSEE:**

Well, they're not going to-- if you've got a faculty member to give up lab space, which around here is not one of the easy things to do-- and plus they didn't have-- I'm just trying to think through. I hadn't thought about this approach. They had enough money to buy a reactor, a commercial piece of equipment.

So they couldn't start small and scale up because you couldn't do it twice. So you had to be all in. So you needed a reasonable amount of space. And I think finding a faculty member to do that-- if they'd done it, that'd be a way forward.

**AUDIENCE:**

Obviously an approach I would have shoehorned it into a UROP. And then that would give me money and space.

**RICHARD SCHMALENSEE:**

UROP is not going to give you space. UROP is not going to-- space is the killer here because space, it's free, and it's a status symbol. So there are no worse fights at any university than over space.

**AUDIENCE:**

[INAUDIBLE]?

**RICHARD SCHMALENSEE:**

Ultimately, it's the faculty member's lab space, ultimately. Yeah, let me go back there, then here, and then I'm going to move on.

**AUDIENCE:**

And just one of the thing I think maybe they should have done, and I doubt they did this, actually look at this. I mean, I doubt that they actually sat down and realized that this is mostly this department, and this department, and those people who know that. So maybe I think they're the kind of-- talk to someone, and then that person from someone else. I think it was kind of like learning by doing things. And I think if they had some their homework and sold the structure, maybe they would have known to do this versus stupid.

**AUDIENCE:**

I was going to say going through the top-down method, one of the things they learned later on was that MIT does not react well to bad publicity. So working with the mtvU initiative, they were the ones that gave them the initial grant saying, hey, we're going to work with them. They gave us this initial grant.

They want to come back a year from now to see what we've done with that money, and they want to do a special piece on MIT, it would just hit MIT right away and be like, all right, now we have to do this. Otherwise, we're going to look like complete jerks for not letting our students follow through with their initiative.

**RICHARD SCHMALEENSEE:**

And you have to make sure that somebody who cares about MIT's image, and who isn't just rewarded for delivering the mail on time, making sure the trees are trimmed, is aware of this. So let me move on. I think we've hit almost all the points. Oh, that was supposed to come on in pieces. So much for custom animation, but we can do this.

You really have to understand the organization. I mean, every organization that's larger than 10 or 15 people ends up having reporting responsibilities, a division of labor, different people rewarded for different things, some sort of procedures. And that makes change hard. That's not a bad thing. It's good at getting stuff done. It's not good at changing.

So, how do you get change done? Well, there is a tendency to mimic good organizations. MIT occasionally resists this tendency. There was a story of a fundraising organizer years ago that said to a president, to be nameless, well, we haven't done this quite before, but here's how Harvard, Yale, and Princeton do it.

And the response was, we're MIT. What do we care? Well, I mean, raising money is raising money it turns out. And there is a good thing to imitate.

The other thing we saw here is whatever the goals of the organization are that we all have tattooed on our foreheads, people have their own goals. So in no organization do you really get, I live to serve MIT's grand goals, or I live to make money for BP or Apple. I've got my-- in a lot of cases, I have my professional norms and values. I've got my own career concerns. And this is particularly tricky when the organization's goals are fuzzy, and universities' goals are fuzzy.

I think-- one can debate this, but I think this kind of issue of goal conflict is most serious for the organization in middle management. If you're at the bottom of the organization, you're delivering mail, you're delivering mail, and you get rewarded for delivering mail well, bingo. But if you're up the notch a little bit, you have budget authority, you have the ability to direct others, and you're concerned about your own career and about promotion.

And every organization wrestles with this. You want to stand out to be promoted. But, of course, you have to be cooperative for the organization. That's a standard tension.

Lots of good ideas, but limited resources. Pats on the back are cheap. This is exactly what happened to these folks. They trotted around this idea of biodiesel.

And everybody said, that's a great idea. And they were clearly energized by that. But that's free, as a number of you pointed out. That's free. That's great.

Division of labor, it leads to silos. I mentioned some weeks ago that when I came back from Washington, young and bright-eyed in 1991, I pushed for Green Lights at MIT, which Green Lights was then a new EPA program that organizations would pledge to use efficient lighting when it made economic sense.

And so I said, why don't we do that? It's good press, and it'll lead to MIT as an institution to look at its lighting decisions. The place is full of incandescent bulbs. We can save money. It'll be great.

And I got pushed appropriately to Facilities. And the then crusty old head of Facilities said to me, let me explain it to you. The light bulbs come out of my budget, the electricity doesn't. OK. So the notion that I should put in more expensive bulbs to save somebody else's electricity doesn't work because my budget's not going to go up, and I've still got to replace the light bulbs.

Well, I quit. I mean, there are only so many battles you can fight. And I didn't see a way around that without changing MIT'S budgeting procedures, which wasn't going to happen.

I think that basically there was an instruction down to be more efficient. We don't put a lot of incandescent bulbs in anymore. But around 1991, this was somewhat radical that we ought to be moving to compact fluorescents and so forth.

But that's a silo. That's a silo. The guy at Facilities had his incentives, and he had his instructions, and he was doing his job. His job was minimize how much you spend to provide light. That's the job. It wasn't minimize the lifecycle cost because he didn't pay for electricity.

Would it have been better if he'd paid for electricity? Maybe. Hard to do, hard to do. He wasn't graded on it. The system wasn't in place. There were formal rules, divided responsibility, and he was managing his silo.

So I mentioned the next one, that space is unpriced but a status symbol. There are no more brutal fights than over something that's free that you really want. Let me just say that. So when students say, oh, we'd like some space, too, this is like going between the trenches in World War I. It's not a place you really find yourself comfortable, unless you have allies.

And finally, why would Facilities care about you folks, with all due respect? Making you happy is not their job. They report to various other people in the administration.

They do not report to you. They do not report to department heads really or to deans. They report to Facilities up through the executive vice president. So you've got no influence.

So, how does change ever happen? We did get biodiesel. And I will say the Energy minor that a lot of you were engaged in is an example of that. It's the first interschool minor. This took several years of work to get it through various organizations because it wasn't an animal for which MIT had rules.

The notion that-- departments offer minors. There might even be a school minor. But the Energy minor has pieces from engineering, and science, and Sloan, and in principle the other schools as well. There was no governance structure for that.

It all made sense. Everybody approved it. Everybody's, oh, a great idea, a great idea. I just want to make sure we maintain quality control and have the usual governance.

Wait a minute, how are we going to do that without a department being in charge? How are we going to do that? Well, it happened. A number of faculty members cared. The top administration cared. The problem was solved.

But it was another one of those things that didn't quite fit the existing categories. It wasn't a department, it wasn't a live-in group, it wasn't an administrative unit. It was a different kind of thing. It got solved, a lot of work.

So let me walk briefly, given time through the optional readings, which have interesting examples of change. And let me just say a little bit about each of them. They're not tough reading, but-- one of them is.

Sharma has an interesting study of oil and gas firms. And the question is, what determines whether or not they go beyond the requirements of regulation in doing environmental protection? Because a lot of them do. Interesting study. When does it happen?

Well, again, there's a lot of statistical work. But I'll just go down the more likely to go beyond. First of all, companies, there's a lot of questionnaires about attitudes and so forth.

If you view environmental protection as something that the company is about, well, that's not a Friedman view, that's a Handy view. If you have a broad view of what business is for, you can say, and one of the things we try to be is responsible environmental citizens. Milton Friedman would say, we obey the law. Handy might say, well, we go beyond the law where it makes sense, if you view environmental protection as part of the identity, if you view the environment as an opportunity, an opportunity for leadership, rather than a threat to profits.

BP went to Beyond Petroleum, you may recall. It viewed the opportunity as it-- the environment as an opportunity for leadership. Now, did it do much besides advertise? No. But it advertised like a demon. And it viewed environmental protection as an opportunity. Again, these firms that view that environmental protection as an opportunity to demonstrate that they're a leader to make points go beyond.

OK, but this is a positioning issue, just like positioning biodiesel is an opportunity for MIT, not a threat to Facilities, gets it done. So if you view the environment as an opportunity, you're going to do it. Also if you've got money, that doesn't hurt.

Another-- this is actually very surprising. It's a study of 14 pulp and paper mills in various countries. And they have different regulatory systems-- New Zealand, Australia, Canada, US.

But it turns out the differences in environmental regulation don't do much to explain differences in performance, which they can measure. They can measure emissions per ton or per whatever. That doesn't do it. Most did more than was required.

And their conclusion that they draw, being profitable helps. Being profitable a few years before the sample was taken helps, if environmental management style was affected by was the firm profitable. But they all pointed to community pressure. They all pointed to community pressure. If you're in a community that is organized and vocal on the subject of environmental protection-- the plant manager lives there.

This comes to the issue of, would it have mattered if you'd been able to organize 100 students to march on the president's office in favor of biodiesel? Well, yes. They don't have any voting power. They're not in any of those organization charts. Would it have mattered? Yes. It'd be a globe story, among other things. That would turn it. That would turn it.

So it was striking-- again, this is interview work. It's striking how often these folks pointed to community pressure, sometimes their customers, but often their communities, as to how they decided to approach the environment. And this is just-- this they could do by talking to the managers. Were they just barely complying with the law, were they committed to complying, were they trying to be strategic about it, or did they really believe in protecting the environment?

And these are emissions measures. This is biological oxygen demand. This is total suspended solids. And I forget what this is.

But you see that, depending on the company's strategy, which is influenced by the community, by how much slack they have, their profitability, you get better performance per, well, kilograms per day. But I think it's per unit of output, I hope. Andrew, you had a comment.

**ANDREW:**

However, given the community, though, this community pressure, this means to indirectly affect the person who makes the decision?

**RICHARD SCHMALENSEE:**

Sure.

**ANDREW:**

What I'm trying to say that if it could be bribing him, it could be threatening him, it could be--

**RICHARD SCHMALENSEE:**

No, they didn't describe it-- they didn't describe it like that. Take a look at the piece. It was social pressure. It was when you go to the club, people say, the river's pretty smelly today, George. Can't you guys do better?

When you go to the grocery store, people walk around like this. It's that-- that kind of pressure is what they pointed to, not bribing. That's not going to work.

**ANDREW:**

Because only-- ultimately though, should your goal be that I should influence the community, or should my goal be I need to influence that person somehow?

**RICHARD SCHMALEENSEE:**

Sure. The goal should be I need to influence that person somehow. But if you can organize social pressure, if you can run editorials in the paper, you can do all kinds of things.

This one is interesting. Let me just do it quickly so I get you out of here on time. This guy looks at-- first of all, universities didn't do recycling until the late '80s. This person looks at what kind of recycling programs a bunch of universities and colleges around the Great Lakes established between the late '80s and '95. A lot of them went in.

They went in in two forms. And this is social pressure. This is a social movement. We should all be recycling. Isn't this great?

And universities and colleges complied in two ways. Status creation was you name a recycling director, you create a new position, you give it budget, and you say, you're in charge of recycling. And the other way is you say to those folks in Facilities who we've been bad mouthing for an hour and a half, and you say, oh, by the way you're also doing recycling.

Now, you would expect having a person actually in charge of recycling with that responsibility evaluated that way would be more effective. It doesn't measure it. What's interesting is he looked at a whole bunch of variables that determined, did they adopt a status creation approach, did they adopt a role accretion approach? Large selective institutions-- selective institutions tend to have more active students like you-- and the presence of the Student Environmental Action Coalition were all positively associated with this role accretion.

The small public schools that seem to be influenced by their peers were more likely to do role accretion. If you had a chapter of this Student Environmental Action Coalition, you were less likely to do role accretion, very significant impact, very significant impact. Yeah.

**AUDIENCE:**

Did it say in the paper for the status creation if they often got someone from the outside to come and take the position, or if they promoted someone from within their own ranks?

**RICHARD SCHMALEENSEE:**

They actually did. They actually did say. And it tended to be a recent graduate who had been active in this area, just the sort of person you would expect, right?

And let me just for fun, if you're looking for something interesting to do, first look up SIAC on Wikipedia and read what it says about it, and then go to the group's own website and read among the most amazing histories I've ever read. It's when they say 1996 was a bad year for us, we lost all of our funding and staff. It's a really, really interesting-- but on Wikipedia, they have 70 college chapters and are very active. This you can read on your own. It's a summary of some of the stuff we've talked about.

I'll see you Wednesday for the quiz. The quiz will be lovely. It's closed book. It does not require computation. It does, I'm afraid, require some thinking.

It does not require a lot of writing. So please, we all hate the strategy of, if I put enough down, I'll get a good grade. Don't do that, please. Thank you.