



RICHARD COOPER

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Nobuo TANAKA

Let us move to Richard Cooper. Richard, do you have some ideas about this? We know you have wisdom, so please show your wisdom.

Richard COOPER

On the gender issue, I will start out with that. I have two teenagers. Both are highly sensitive to the climate change issue, and the son no less than the daughter. This is a very small sample of this generation and I do not notice any difference between the two. As an American on the panel, I should say – having sat through the plenaries yesterday and today – non-Americans should not confuse the US government position under Mr. Trump with the American position. It is very important to understand that people implicitly more than explicitly assumed that Trump leads the United States. He does technically, but he does not on attitudes towards many issues, and this is one of them.

It happens that two weeks after Trump announced the potential future US withdrawal from the Paris Agreement, the Conference of Mayors met, representing 1,400 American cities. They voted overwhelmingly to repudiate Trump on this particular issue. These are republicans as well as democrats across the country. It has to be said at once that not all cities have climate change policies. The city that I come from does but not all cities do. The polls continue to show that climate change is not the most salient issue but is one of them in the attitudes of Americans.

The employer I work for, which is Harvard University, has a very aggressive green policy, as they call it. I do not like that term actually, but it has stuck. They are doing all kinds of things, including something that has not been mentioned, which is geothermal. We have a geothermal house. I have not been given the financial details on the building of the house, but they have drilled way under Earth. They have used the stabilization of temperature in the earth, both for heating in the wintertime and cooling in the summertime. It is experimental and it is designed to show students what can be done. We will see whether it works. Harvard has no lack of resources, so I am not sure it would meet any investor standards on that.

In my remarks, I will follow the outline that Fabius used this morning: technology, finance and policy. On technology, there is something amazing that would surprise anyone who has not looked at what has happened in the last 10 years. This is how quickly the cost of solar has fallen, for both versions, solar photovoltaic and concentrated solar. This is compared to what it was a decade and certainly two decades ago. We see how fast the cost of land-based wind has fallen. Sea-based wind is falling, but is still far above land-based wind.

The problem with solar and wind is storage. People talk about batteries. That is too narrow a way to think about it. There are many forms of storage, and batteries are only one of them. I know down the river at MIT, they are working hard on batteries for windmills. They are big at the base of the pylons. They are not for cars, but they are alleged to be much more efficient than lead acid batteries and much less expensive than lithium batteries. That is being worked on, but we should not forget pumping of water as a storage thing. That does not work very well if you live near the desert, where there is a lot of sun and not a lot of water, but in some parts of the world, it works very well.

There is heat storage. Concentrated solar uses heat storage metals, which are heated up to 700°C, and that retains the heat through clouds, night-time and so forth. There is hydrogen, which you mentioned and which is a way to store, particularly if we are looking for motor fuels and thinking ahead, not to next year but to within a decade or more. This is a very good use and way to store energy. There are flywheels, which come up from time to time. Any physicist will remind you of them, but somehow, they have dropped out of the picture in storage. However, one can imagine



flywheels and we have very efficient flywheels these days. We should talk not just about batteries when it comes to storage, but look at the whole range of potential storage vessels or vehicles.

Regarding finance, various numbers have been floated about. I have not tested any of them, but I find the numbers much too large, the ones that I see. That may just reflect my ignorance, but this is a really good time to float securities. Interest rates in Europe are negative outside of Italy, and in Japan, they are negative. For governments, for high-quality private or international securities, they are positive but very low. We should increase the capital of the international financial institutions, the World Bank, ADB, Inter-American Development Bank and so forth. There is the EIB in Europe.

This is not a strain on budgets. It does imply a guarantee, but this is a very good time to float a lot of fixed-interest securities. According to economic analysis, there is a heavy demand around the world for high-quality fixed-interest securities, much of which goes into US treasuries. However, it could go into other vehicles as well. It is a very good time, and we should get up on the international financial institutions. I am not talking about the IMF. I am talking about what we call banks, but they are not banks. This is to engage in this issue more than rhetorically.

I know the World Bank has a big program in this to study the issues and make recommendations. They do not do much lending in this area as such. You have mentioned sovereign wealth funds, which is another source of funding. They are looking around for good yields on securities. I do not see a shortage of finance at this moment in time. It is a question of mobilizing the finance and providing to take care of some of the risks and government guarantees through capital and promises of capital for these international institutions.

Policy is the third category, and I was interested to note that Fabius mentioned carbon tax. I have favored a carbon tax for 25 years. As this conference illustrates, we, the world, have many objectives, besides dealing with climate change. One of them in my view is preserving the international trading system. I see a huge potential conflict between dealing with climate change on a national basis or on the basis of the European Union and the trading system.

The first thing that private firms and countries will want is protection against competition from countries that do not have a comparable climate change policy, whatever that means. Once you can see those pressures in the United States, one can sometimes see them openly or much more covertly within Europe. It is not well noticed that when the ETS, the European Trading System, issue permits, they issued them to nations, and the nations in turn way over-issued them to the steel industry in Italy, to the ceramics and glass industry and so forth. These are indirect subsidies to these industries.

The way to get around that is to have an internationally agreed carbon tax. The actual number would be a negotiated one. I would start out at USD 40 and test the waters and see how it would be, with the proceeds of the tax to be held by each country levying the tax. We do not get into the issue of international transfers, which raises a whole different can of worms. Countries could do anything they want with the tax except undermine the purpose of it through subsidies. For example, it could be revenue neutral. They could give it back to the public in various ways. They could redistribute it. They could give off a certain portion for R&D on climate change, but that would be up to each country what they did with the proceeds in my view.

My own view is that the cap in trade, which is the favored device by environmentalists who accept the principle of the market in permits, cannot be made to work worldwide. Europe can make it work, the US if it were willing could make it work, and Canada can make it work. However, it cannot be made to work worldwide, for reasons we will not go into. It is an absolute invitation to corruption. You are handing out permits which have real monetary value. That is a total invitation to corruption around the world, and any US legislator who understood that could not vote for it.

If you look at the models of pricing of carbon through cap in trade, as in the ETS, they all show that the big gains come from transfers between rich and poor countries. There are efficient countries, countries that use energy efficiently and those that do not use it efficiently. I strongly favor it and I am interested that Leila mentioned them. This morning on the panel, they were mentioned, and cap in trade was not mentioned. I do not know whether that was inadvertent or whether I am very slowly winning the argument.



There is a final thing I want to say as a matter of agreed policy. Whether it is universally agreed is less important, but we should be building no new coal-fired power plants anywhere in the world. We have them and we have a tremendous amount of inertia in the system. We will be using coal for decades, because as was pointed out earlier, 40 years was mentioned for coal-fired power plants. With some renovation, they can last 50-60 years. We have a lot of them around.

China is backing out coal as rapidly as it can through many different channels including nuclear, LNG, solar and so forth. However, because of air pollution and harm to Chinese health, they are building coal-fired power plants as part of BRI in other countries. That should be stopped. I see in my own view that in the end, we will do solar. The end is several decades away, and I see natural gas as being the bridging fuel to solar. In particular, natural gas is a great substitute for coal in generating electricity, as well as other uses. I see natural gas as the natural thing. You can call it biogas. It is any kind of methane, and it is a natural bridging fuel between where we are now and solar power, where we need to get to eventually. This is supplemented by some other things, but that is decades away.

Nobuo TANAKA

Thank you very much. This cap in trade thing is an interesting point. I talked to some Chinese people about that, and in China, they are planning to have a cap in trade in six or seven provinces.

Richard COOPER

They tried.

Nobuo TANAKA

Now they are moving out of it.

Richard COOPER

By moving out, do you mean dropping it?

Nobuo TANAKA

Yes, they are dropping it.

Richard COOPER

I did not know that.

Nobuo TANAKA

They are dropping it because solar is getting so cheap, cheaper than coal, so there is no need to introduce any kinds of initiatives in China.

Richard COOPER

I have looked at the pilot projects. They were remarkably non-transparent. It is very hard to find out what went on in each of them. It started out with seven provinces and ended up with six, and they declared it a success. However, they were not able to demonstrate to any outsider that they were successful, with the formulae for issuing the permits and so forth. I am glad to hear that they have dropped it.

Nobuo TANAKA

Leila, do you have a comment for him about the taxes or carbon prices?

**Leila BENALI**

No. We agree and we were agreeing all the way through. Let us not make it complex and let us agree now. Agreeing on a price is probably a big concept, but we could have some indications, and take the first steps to get back to the level playing fields between the different technologies. As I mentioned, in mobility, the efforts to have all costing approaches are creating perverse effects, where you favor existing technologies and systems. At the end of the day, if we want to cost carbon in such a way, let us do it in an integrated way, but let us keep the scheme as simple as possible.