

Flagship Seminar Series:

Getting to Net Zero – An Approach for India at CoP 26

Centre for Social and Economic Progress (CSEP)

New Delhi

Thursday, September 16th, 2021

CSEP Research Foundation

6, Dr Jose P Rizal Marg, Chanakyapuri, New Delhi 110021, India

Ph: 011 2415 7600

CSEP Research Foundation

Regd. Off: Second floor, 6, Dr Jose P Rizal Marg
Chanakyapuri, New Delhi 110 021 India
T: +91 11 2415 7600 E: info@csep.org W: www.csep.org

Authors:

Montek Singh Ahluwalia – Distinguished Fellow, CSEP

Utkarsh Patel – Associate Fellow, CSEP

Discussants:

Naushad Forbes – Co-Chairman, Forbes Marshall

Shyam Saran – Former Foreign Secretary and Senior Fellow, CPR

Sunita Narain – Director General, Centre for Science and Environment

Surjit Bhalla – Executive Director for India, Bangladesh, Bhutan and Sri Lanka at the IMF

Moderator:

Vikram Singh Mehta – Chairman & Distinguished Fellow, CSEP

For more details on the event:

<https://csep.org/event/flagship-seminar-a-strategy-for-managing-climate-change-in-india/>

The following is an edited and revised transcript from the event. It has been generated by human transcribers and may contain errors. Please check the corresponding video for the original version.

PROCEEDINGS

Vikram Singh Mehta: My name is Vikram Singh Mehta. I'm the chairman of the Center for Social and Economic Progress. On behalf of my colleague, Rakesh Mohan, the president of CSEP, who unfortunately cannot join us today because he is somewhat under the weather, and myself, I welcome you all to this webinar on "Getting to Net Zero – An Approach for India at CoP 26." The webinar is to discuss the paper written by Montek Singh Ahluwalia, Distinguished Fellow of CSEP, and Utkarsh Patel, Associate Fellow of CSEP. We have four expert discussants, who I will introduce in due course, to lead the discussion. I do not have to say that this paper addresses, perhaps, the most important issue facing the global community today. The sixth report of the Intergovernmental Panel on Climate Change has delivered Code Red warning for humanity. It has confirmed unequivocally, that human activity is responsible for approximately, 1.1 degree of warming since the mid-19th century, and finds that, on average, over the next 20 years, global temperatures will most likely rise by at least, another 1.5 degrees. It is clear in other words, that in the absence of groundbreaking progress at the forthcoming United Nations Climate Change Conference, CoP 26, global temperatures will increase by more than 1.5 degrees above pre-industrial levels. This would be a disaster for the world, and India would be amongst the most severely affected countries.

Many countries including some in the developing world are willing to commit to the reduction of greenhouse gas emissions, also, perhaps known as the nationally determined contributions. But in light of the IPCC report, perhaps the most high-profile objective of CoP 26 will be to secure a more ambitious emissions reduction program. Whether it meets its objective or not, remains to be seen. But one can expect the discussions will be fraught and contentious. The developing countries have reason to feel frustrated about the disproportionate impact on them from climate change, and about the fact that the high-income countries have yet to make good on their pledge to mobilize \$100 billion to help low-income countries decarbonize and better adapt to climate change. India will be in the crosshairs of this debate and discussion, especially as it has traditionally refrained from making any commitments. It has argued with logic and force that its development objectives cannot be compromised. But the question now is whether in the face of the changes in technology and the reduction in the cost of renewables, this argument needs now to be reviewed.

Montek and Utkarsh, have in their paper, addressed this question and many more. They have examined the scope through reducing emissions, through demand management, efficiency, fuel substitutions, they've identified the many structural changes that the energy transition will call for and the actions that various levels of government will need to take. They have then recommended an approach that India could perhaps a dumped at not just CoP 26, but at all the various multilateral fora, at which this issue will be discussed in the coming weeks. This paper is timely, and it is important. And this is the reason why today's discussion could be very enriching. I'm going to moderate the discussion; the format will be as follows. I will request Montek and Utkarsh to provide a five to seven-minute overview of the paper. And following that, I will ask each of the panelists to comment on the paper for between 10 to 12 minutes. Each of them has already received the paper and I will introduce them as in when I invite them to speak.

Following the comments, I will request Montek and Utkarsh, to respond or shall I say, elaborate further. And during that phase, I will also address questions that have been raised in the chat box to specific panelists. We will close the discussion at 7pm. Well, thank you. So, let me now just turn to

Montek, but before I do that, a very short introduction. Montek is a Distinguished Fellow of CSEP, he has held almost every major position related to economics and finance in the Government of India. And I will not list them all, but they have included the Chief Economic Adviser, Economic Adviser to the Prime Minister of India, Finance Secretary of India, and Deputy Chairman of the Planning Commission. Montek was also a senior executive in the World Bank. And I can just say that one of the best decisions that I've taken in recent years, is to persuade Montek to join CSEP as a Distinguished Fellow. Montek, may I turn this over to you now, please.

Montek Singh Ahluwalia: Thank you. Thanks very much, Vikram, for your very kind words of introduction. Actually, you've also summarized the context in which this paper was written, the IPCC and all that. So, I don't have to repeat all that. I just want to make one or two points, and then we'll hope that we get a chance to respond to the questions and the discussion of the various discussants. I think the key issue, which you alluded to, is that our traditional approach has been to completely avoid making any commitment on reducing emissions. And there are two things that have changed since then. One is that the situation has now become much more critical, compared to what it was 10 years or 15 years ago. And the IPCC says that the world as a whole, must somehow get to net zero by 2050, otherwise, we will have a truly devastating effect on the climate. And as you rightly pointed out, India would be one of the countries to be worst affected, and so, we cannot be indifferent to this.

So obviously, it is in our interest to somehow, combat this threat. It's also clear that we can't do it by acting alone. I mean, all we can do is help to nudge a global consensus in the direction that will actually bring about the mitigation that we want, and the reduction in emission. I mean, that's one side of the urgency that makes us think again. More important, I think, is what you also mentioned, that our traditional approach has been to focus, quite rightly, I think, on the historical responsibility issue. Global warming is taking place because of the accumulation of GHGs, which stay in the atmosphere for a very long time. And this is dominantly, due to the activity of the developed countries, not our activities. We are at a stage where we need to increase our GDP in order to deliver a developmental outcome. And of course, traditionally, and even today, you can't increase your GDP without actually increasing energy use, which has traditionally meant more emissions. So, we've said, "Look, you can't expect us to reduce emissions." Now, what we point out in the paper is that this is what has changed. The technology today allows you to switch from fossil fuel energy to renewable energy.

So, we can increase the total energy that we absorb in the process of development without increasing emissions, and maybe even reducing emissions, provided we can move swiftly to renewable energy. And this actually involves a two-stage operation. One is, you electrify whatever you can, and the second, that means, for example, instead of direct use of fossil fuel, you rely on electricity, that's what EVs and railway electrification, etc., does. And given that you've then electrified, you move to renewable sources of electricity to generate that electricity. And on that basis, you can actually reduce your emissions. Now, the only argument against that is that this is not economic. But we've looked into this and it looks as if even if you were to ask the question, "Is this an economically feasible transition?" The real question that you have to face is, "What happens to the intermittency of wind and solar?" I mean, you do need to balance that, that requires a whole lot of things, including, for example, battery storage, plus other options, that involves costs. So, although the cost of renewables without taking account of intermittency is falling very sharply, you've got to drag that up to allow for the additional cost, that stabilizing the supplies will bring them on.

And our conclusion is that, even when you do that, on some reasonable assumptions about how those costs are likely to go down, renewable energy will become competitive with conventional energy, which suggests a big change that could take place in favor of renewable energy. And that change will actually be economic; it would not involve a cost. So really, there's no argument for not doing it and it

doesn't compromise on the development objectives. So, with that background, we've looked at what's happened, and the honest truth is, we seem to be talking the talk in many areas, and also, taking some action. I mean, for example, railway electrification is set to be completed in a couple of years, and railways themselves say they'll be net zero by 2030. So, that's a very big transition, where we set ourselves an internal time. Electrification of vehicles is just beginning. The industry is making a lot of ambitious noises about how much the sale of electric vehicles as a percent of the total will increase. But that's not what we need. What we need is electrification of the entire passenger fleet. And that will require a scale of transition, which is actually much faster than what is currently going on, but it's not something that's impossible.

I mean, it will require some fiscal steps, some statutory enforcement of regulatory changes, mandatory switches from one kind of technology to another, etc. There are many other things and I wouldn't go into them now; they're all listed in the paper. Now with that background, what is our recommendation for the CoP 26, and in a way before that, for the G20? We basically come out with the five-component strapping. First component is that we should point out that there is really no logic to 2050 being viewed as a common net zero date for all countries. I mean, the fact is that there's nothing wrong with, in a way, interpreting climate justice to mean that the developed countries should get there faster, and that gives developing countries more of a chance to get there later, without upsetting the global carbon and balance. But the first point is that common 2050 doesn't make sense. The second point really, is that even fixating on a net zero date, doesn't make sense. What we should be talking about is a trajectory of emissions reduction, because two different trajectories, both of which get to net zero at the same time, could be much worse or better for the environment, depending on what the shape of the trajectory is. So, rather than countries saying, "We're going to get to net zero by a certain date," countries should be asked to indicate what their trajectory will be.

I mean, for a developing country like India, it could mean peaking a little bit for a few years rising, peaking and then falling, but getting to net zero much later than 2050. But China, which is already very high, it could mean no more time for peaking, just come down sharply. And certainly, for the developed countries, it should mean coming down very sharply. And in that sense, the US and the EU have talked about having emissions by 2030. That's the kind of short-term target which is more granular, easier to monitor, and I think that's the kind of thing that we really ought to encourage. Now, what about ourselves? I think we've done a review of a number of models, which exist, not our models, but their models that have been built at different research institutions. Obviously, they give different results, but all of them suggests that the kind of strategy that we are outlining is consistent with peaking in a few years and then coming down very sharply. One of the trajectories that we identified, seemed to me to be quite credible. That is, India peaks emissions by 2035, and then goes down to net zero, maybe somewhere between 2065 and 2070.

Some people tell me that that's actually unnecessarily long, and that if things go a little better, we could actually get there even earlier than 2065. But I just feel that we should put forward what we think is a sensible trajectory, and that trajectory is best defined or identified by NITI Aayog. NITI Aayog should review existing models – we've reviewed some of them, but there may be some others. And undertaking extensive consultation with all the stakeholders, including representatives of industry, and state governments, and come out with what they think, is a reasonable trajectory to aim for. Now remember, if you're projecting to 2060, there'll be a lot of uncertainty. So, we should not be afraid of uncertainty, we should say, look, as a best guess, this is what we are going to get to. And this enables us to judge what we're going to do in the short-term.

Specifically, in the short-term, I think we ought to do something similar to what the US and the EU are doing, except they're talking about halving emissions by 2030. We want to come out with the relevant

plan for phasing out coal-based electricity generation. Now remember, we have very ambitious renewable energy targets that we have set, we're being applauded for it, and that's good. They will have to be increased even further. But the other side of the same coin, is that as renewable energy generation increases, I mean, the generation of coal-based electricity has to be phased out. So again, that's a controversial issue, but we need to come to an agreement, "How are we going to phase this down over what period?" and we have suggested that coal-based generation could actually peak in the current decade, and then slowly go down. We could actually retire many of the inefficient and high cost existing plants and bringing in some of the new plants, which would allow faster acceleration of the phase out. This could be if you like, our short-term plan.

Now, having said that, I think that we should also make the point that the trajectories that different countries submit, none of them is being derived from an assessment of the fair share of the global carbon budget, which goes to a country so that the trajectory is such that it just uses up its carbon share. They're just trajectories that are being put forward by countries, and the only anchor being given at the moment, is net zero by 2050. And frankly, if the top 20 countries put forward their trajectories, I think we should ask, or CoP 26 should ask the IPCC to evaluate the combined effect of these 20 trajectories with some assumption about the others. I mean, these will account for almost 80% of the total emissions in the world. And as technology changes in the direction in which these countries are changing, it will change for the other countries automatically. The IPCC will then look at these trajectories and tell us what this does for the 1.5 degrees' centigrade target, or for that matter, the looser two degrees' target.

And if it is not good enough, then CoP 26 has to sit down and decide how do we modify these targets in a manner that's fair? And issue of fairness and climate justice will then come in again, in finding out how to modify these targets. Finally, and this is something which you touched upon. The best way of bringing in climate justice in this context, is to recognize that this humungous transition developing countries need to undertake, even in their own interest, is going to cost a huge amount of money. I mean, in India, for example, we estimate that almost two percentage points of GDP is the additional investment that we need in the energy sector, in order to bring all this up. Now, that's not a degree of mobilization that's going to happen internally. I think the global community has to recognize that it needs to provide a credible framework of financial support, which can assist these countries, both to mobilize funds themselves, to mobilize private funds available abroad – there's a lot of private funding now available for green investments, but that needs a certain amount of risk mitigation, plus, straightforward long-term finance at reasonable interest rates.

Now, we need to distinguish between the low-income countries, which may actually need aid, whereas countries like India and other middle-income countries will need a lot of money, but it will be long term finance at prevailing modest interest rates in the world, which are actually much more favorable than the interest rates that prevail domestic. This is something that the Multilateral Development Banks are ideally fit to do, and I think CoP 26 should give a very clear signal. Looking at the total, I mean, I think there are estimates of 600 billion dollars which IPCC had estimated the developing countries need. I think John Kerry had also repeated this number. Obviously, some of this is going to come domestically, some of this is going to come from private flows abroad, but a significant amount has to come from the multilateral development banks. And, frankly, that requires government action. And if the global community wants to convey that it is serious, the best thing it could do, is to use the G20 forum in October, to give that signal about the scale of support needed from the Multilateral Development Banks. I mentioned the G20, rather than the CoP 26, because it's really the G20, which controls all these institutions. And if we can't get a positive result from the G20, there's no chance of getting it at all from the CoP 26.

So, those are the broad elements of our strategy. I think these five things together, are a different approach from what we've adopted in the past, they will be controversial, many people fond of our traditional approach could criticize them. But I think, given the present circumstances, and given that we are able to be amongst the worst affected, and we are the third largest emitter of GHGs as an individual country, and the fourth if you count the EU as one, is difficult to believe that we don't have a trajectory to offer. We should be able to say, "Well, look, this is what we think is consistent with our development. And I think it can be made consistent with global requirements." That's really the message of our paper. Thanks very much, Vikram.

Vikram Singh Mehta: Thank you, Montek. That was really great summary of the paper. I'm not going to come into it, I'm just going to pass it on to Naushad Forbes, first of our four panelists. Naushad is the co-chairman of Forbes Marshall, which is India's leading steam engineering and control instrumentation firm. He's also chairman of the Center for Technology Innovation and Economic Research. And of course, he is on various boards, and they'll just take too long to list out. He was the president of the CII, the Confederation of Indian Industry in 2016. And I should say, and hope you don't mind my saying this, Naushad, that you are in my eyes, one of India's most cerebral industry leaders. And I'm really grateful that you took time off to be with us today. All yours, Naushad.

Naushad Forbes: Thank you. Thank you very, Vikram, I'll take your cerebral comment as a compliment. In business, it may not be seen as such.

Vikram Singh Mehta: That's why I said, I hope you don't mind my saying so.

Naushad Forbes: So, first of all, thank you very much for inviting me to be part of this program. It was a great prompt to read a great paper, I really enjoyed it very much. And I think it's not only a very enjoyable and interesting paper, but it's a very important paper and a very timely one. Timely not only because of it being out in time for CoP 26, but timely also, because of the challenge that we face, and because it can play a big role in shifting the debate in the direction that Montek just elaborated. I think it's very important that the discussion move on to seeing climate change as something that is in Indian industries' interest, and in the collective interest of all of us as citizens and not something that we need to be defensive about in international circles. I agree completely with the approach of having different speeds for different countries in getting to net zero.

I think the approach of having a threefold strategy of energy efficiency, electrification of sectors combining with green electricity, and then, emissions mitigation, is the right approach. And I agree, also entirely with the point about the end conclusion of saying that, "Look, could we offer something around peaking of high energy demand by 2035 and then getting down to net zero in terms of carbon emissions around 2070". I'm going to limit my comments to three different points. First, to energy efficiency. Second, the question that is raised in the paper of how do we build a really competitive new energy industry in the country? And then third, a question actually around state capacity, and it's a question for Montek, and Utkarsh, because I think it's going to be critical to us achieving and delivering on the very ambitious goals that the paper lays out. So, let me start with energy efficiency, and I think it's the area that I feel most competent to talk about, because as a company, we're in the energy efficiency business. And I particularly want to pick up on the point that is made in the paper about the role of pricing in energy efficiency. I've long had a favorite proposal for companies that say they're serious about energy efficiency.

And my proposal to them is always, "Well, why don't you tax yourself at 100%?" And they say, "What do you mean tax us at 100%?" I say, "Well, whatever you pay for your energy today, take the same amount and stick it in a bank account, and then you can use it for anything else that you wish. You can

use it for expansion, you can use it for investment in energy savings, you can use it for anything you wish, but tax yourself at a rate of 100%". The important thing is that not only should you tax yourself so substantially, but you should also do it overnight, you mustn't do it gradually, you need to actually provide a shock in terms of pricing as the best way of getting everyone to really focus on the potential of energy efficiency, and then, what needs to be done. Now, as it turns out, the world coal market has come very close to doing exactly what I've been proposing as the scheme, because coal prices as you all know, have risen dramatically in this last year. They're up about three times in this last year, and they're up about, I think, they've doubled in the last eight months.

So, we've pretty well seen that kind of dramatic, hard, quick doubling of energy prices in a very short timeframe. And we've seen this in our own experience. As we go around and talk to our customers, we see a focus on energy savings that we've not seen before. We see a desire to move with proposals that we've not seen before. We see a need for energy audits that we've not seen before. I think, really, using pricing and pricing mechanisms as a way of driving energy efficiency can be a very powerful way forward. And I would only recommend that the paper may be elaborate a little on how this could be done. And I have a favorite proposal, if you like, to add to this. One of the things the paper mentions is that well, one could have a carbon tax of maybe a minimum of \$25 a ton for, say India, going up to say \$75 a ton for richer countries. And my argument would be, why does it need to actually be lower for India? For example, most people would argue that as the world moves away from the use of fossil fuel, they would expect the cost of fossil fuel to fall.

Well, as the cost falls, as we've seen in the past as well, why not make up for that fall in cost with increases in a carbon tax on coal? Such that you actually say that, well, for the foreseeable future, India is going to pay a minimum, \$177 a ton for coal. It might be made up of tax, or it might be made up of the price if the price remains high. Because if you provide that kind of certainty, going forward, it could be very powerful. As the paper points out, this is what we've done for oil, essentially. We've tended to raise taxes as oil prices fell, and then sometimes wrongly, we scale back those taxes when oil prices rise because of political pressures, which is a mistake, but we can do this, I think, quite powerfully and effectively for coal prices. And it would be a way actually, of bringing about a very substantial shift also in how electricity is generated, and it would directly address what the paper pushes for, which is of having a fairly early peak in coal-based power generation, and then a gradual tapering off after that. Second point is, how do we build a really competitive new energy industry? I think this is an important point.

One of the things that worries most people in Indian industry about our shift to renewables, is if you like, trying to get the balance right, between progress on implementing renewables and imports of equipment. Because if you look at photovoltaics, how do we progress substantially in our implementation of solar power without seeing huge increases in our imports of photovoltaics, and not only our imports of photovoltaics, but our imports of photovoltaics, which, as you all know, overwhelmingly come from China. So, we keep saying that we want to move away from this dependence on China. If we see substantial progress in our implementation of renewables, we will see, at least the way things are now, a substantial increase in our dependence on imports from China unless something changes. So, something needs to change. So, the same applies to electric vehicles. Again, the production of electric vehicles in India might be growing all the time. But all of our electric vehicles, whether for two wheelers or four wheelers, is built on imported batteries, imported drive trains, and imported control units. And again, overwhelmingly, all of those pieces come from China. So, same thing, right? How do we build a really competitive local industry?

Now, I love the phrase that was used in the paper, which is, it has to be a competitive industry, because our approach in the last four years has been to use tariffs. And as we all know, tariffs are not a way of

building a competitive industry. Tariffs are a way of building a protected industry and a largely uncompetitive industry. How do we get this right? What kind of timeframes do we need to work out? There are, as you would have seen in the last few days, there have been a PLI scheme announced specifically for electric vehicles. Good area for us. But is PLI the way of building a world competitive industry? I worry about that, and I hope we can get into that with some discussion later on. And I wonder here, again, the one thing that I would recommend here, is policy certainty. The biggest and most damaging policy for investment, is uncertainty in the policy environment.

Now, we can't be certain about climate change, and what impact and how fast it will happen. We're clear about the direction, but we can certainly have less uncertainty in the way in which the government speaks. Why do we hear different dates for electric vehicles from NITI Aayog and the transport ministry to take an example? And then, the prime minister will come up with a third date. This is the same government, within three months, and you get three different dates for something as fundamental as by which date will we need to only see electric vehicles being sold in the country. That uncertainty has to go away. Because only if that uncertainty goes away, can industry then seriously think of what the scenarios are, and therefore what the investment opportunities and what the investment requirements are. My third point is around state capacity. And I always worry when progress depends on subtle application of judgment on a continuous basis. Because, unlike mutual funds, I think past experiences is in this case, a guide to future results. Because where we demonstrated the ability to apply discretion and judgment over decades in tweaking policy so that we get outcomes right.

So, the question that I have for Montek and Utkarsh is, "How do we follow a strategy that minimizes the demand on state capacity?" You have to have some state capacity, but how do we follow a strategy that minimizes the demand we place on state capacity? And it seems to me that getting a few bigger things done, is easier than getting many smaller things done with constantly for judgment, tweaking adjustment over decades. So, for example, a substantial carbon tax, fixing the price of coal. Doing it once, that kind of thing, might be a more doable thing, than do for example, what was recommended in the paper. Adjust rail tariffs gradually, over a long period of time. I mean, again, whenever we ever demonstrated our ability to do something like that. Now, some more principles that could go with this point on state capacity. I'm a big believer in technology agnosticism for policy. But by and large, the state should not pick the right technologies, and in terms of what's worth doing. That's why I have a problem with PLI, because by nature, PLI is picking a winner's approach. It says these are the sectors, these are the products going into these sectors, these are the components going into these products that matters to us in the future. And then, you have this picking of winners that ends up.

I think a carbon tax is a good one big thing that we could do, and I think also, that it would be useful to think about how we have broader funding of research as a broader way in which the state on a peer reviewed basis, can offer support for new sectors, instead of saying, "This is the new sector, let's have a subsidy for it, let's have an incentive for it, etc." Instead, just fund widely, the talent that we produce in the country for those sectors as the best way of building in the long run, a more competitive industry in these sectors. Last comment on state capacity, and then I'll stop. We also need to build negotiating capacity. The paper makes some pretty, I think, subtle and sophisticated arguments. For example, around the whole timeframe and trajectory of getting to net zero, the point that we should worry less about the end date and more about the trajectory and not exceeding peak levels. And I think, how do we build that capability and competence within the state again, so that we can negotiate in an effective way, whether it's in Glasgow, or whether it's in a longer-term time horizon? Let me stop there, but just to repeat again, I love the paper. I thought it was very interesting, I thought it was very forward looking,

and I thought it generates exactly the kind of debate and discussion that we need in the country very widely. Thank you.

Vikram Singh Mehta: Thank you so much, Naushad, that was very, really very interesting and valuable. I'm going to turn to Sunita now if I may. Sunita Narain, she is the Director General of the Center for Science and Environment. She's also editor of the fortnightly *Down to Earth*, and she is in my view without exaggeration, one of India's foremost voices on issues related to climate and the environment. For decades or more, I may be getting my dates wrong here, her effort to persuade the authorities at every level to weaken the link between economic growth and environmental impact has been widely recognized and acknowledged. I will not list out all the awards and all the recognition that she's got, but she did receive one, which is the Padma Shri, which needs to be cited here. Sunita, may I turn to you, please?

Sunita Narain: Thank you, Vikram. I'm also very delighted to be here. Montek, I have been sparring on these issues for so long that it is wonderful to see him on our side. And I have to say, he will bring huge amount of, as he has already done, thought, leadership, but also, credibility to the issues that we all heard about. So, thank you, Montek, thank you for doing this paper. And I hope you will forgive me for being my usual blunt self in saying, Montek and Utkarsh, you haven't gone far enough. And I think that's where my biggest problem with your paper is. I think you're still caught in a framework, which is too timid and too transitional. We need transformational action. And we need the logic and the economic rationale for the transformational action. Now, from my perspective, Montek, I am not in favor of net zero, I'll be very clear with you. I think net zero targets that have been put out, the call was from IPCC, when they said net zero by 2050. But you have to understand, and I'm glad in your paper, you have also highlighted the sheer iniquity of this 2050 target, because if the whole world has to move to net zero in 2050, then, many parts of the developed world and you know the countries, I mean, even now, 70% of the emissions and the carbon budget has been emitted and continues to be emitted by just six countries, including China and one EU.

So, you have to understand the gross and you talk about it in your paper, but my only position is that you don't go far enough. The fact is for people like me, and many of you may not know, but I wrote with my colleague, Anil Agarwal, a paper in 1991, called "Global Warming in an Unequal World – A Case of Environmental Colonialism." And since 1991 to now, I strongly believe in the principle of climate justice, not only because it is a moral issue, but because it is the only way for us to get an effective climate agreement. If in 1992, when the framework convention had been agreed to, we had gone ahead with the principles of saying, let the developed countries reduce, let the developing countries increase, but let them increase differently, because they will get money and technology, we wouldn't be in this hole today. But that's the past. What happened over the last three decades is, there is only one other country which increased and nobody else reduced. China increased and took up all the space that was available. And that's where we are today, and we cannot run away therefore, from the question of equity and historical responsibility by saying that that is something that we cannot talk about or use as the framework for further action.

Now, that said, I still believe and I do believe very strongly that it is important for India, therefore, to be proactive about climate change, but slightly differently from the framework that you have suggested. I think India should reject the idea of net zero, because the net zero targets that have been put out by the West are flawed in three perspectives. One, they do not have details that tell us how they will reach net zero. There is a huge dependence on sinks and market-based mechanisms and every net zero plan, and we know the unreliability of the sinks and how it will only increase as climate change increases further. And also, looking for sinks in the developing world, takes away our right to the low hanging fruit. And the third reason why net zero in my view, needs to be rejected, is it is too far away

in the horizon 2050, China's 2060 and India will then be 2070. I certainly will not be there to see 2070 and not even 2050 I'm sure, and therefore, I think these are just a way to push the ball away. We need to keep our focus on 2030, and we need to be very sharp and clear about the targets that are being set for 2030 and how real they are.

And my third, therefore, criticism of the net zero target is, that it depends too much on what they call disruptive technologies. What you need is disruptive action, not disruptive technologies. And this is really why we need to focus and keep the world's focus on 2030, and not let the US and others talk their way through by talking about 2050, 2060, and 2070. That's number one. Number two, I think very strongly, that we need to talk about the action that we take, not in terms of NDC, but beyond NDC. Because if we get caught in the NDC, and the nationally determined contributions, we know that we cannot, and we must not have an action which is not compatible with the contribution that we have in terms of the emission reduction. We also know very clearly, that these NDCs are going to be difficult. If we have just done a paper and I will send it to you, in terms of each country's NPDC and you will find that the most bizarre part of the NDCs is, that it is the smaller and the weakest and the poorest developing countries that have the most ambitious NDCs.

Now, this clearly is not the way to move. So therefore, what India needs is to put out very clearly that we are an NDC plus framing. And I say that because I think we need to frame our climate action in terms of domestic poor benefits. We need to frame our climate action, not for the responsibility that we need to take in terms of mitigating GHG emissions, but because we need to do it in our interest. And this is where I found your paper interesting, but not transformative enough. You talk about the electrification of the economy, absolutely critical, Montek, but let's make it very, very clear that today, we are not going far enough in terms of electrification. And even if you are going far in terms of electrification, it is not far enough in terms of energy access. We have massive numbers of very poor people in this country who still depend on cooking energy, which is biomass space. We still have large numbers of people in this country, even with a 99% electrified grid, electrified system, who do not have access to reliable power, we need to talk and as an environmentalist, our biggest problem today is the use of coal, particularly in small-scale industrial units. If you look at the pollution in our cities today, it is primarily because we are using massive amounts of coal.

Naushad talked about the fact that coal prices have come down, but Naushad, be very clear. Eight Rupees a kg of Coal is still much cheaper than 42 Rupees a kg of Gas. There is no way you can compete coal to clean fuel today. You have a major crisis of air pollution in your cities. We are talking about thermal power plants. We have today, actually gone back on our commitment to phase out old thermal power plants. In 2015, after CSCs report on the need for thermal power plants to adopt cleaner coal standards, the government came out with standards by December. They were to be implemented in 2017. In 2020, after a huge battle in court where I personally had to stick my neck out, the court agreed to a deadline or 2022. The government has now said that that 2022 deadline is deferred indefinitely because if the thermal power plants can pay the penalty, they can continue to pollute. So, I think it's important for us to voice what you're saying and let me let me take the third example that I have, and again, it's related to air pollution. You talk about very rightly, the need for electric vehicles. I think, for India, electric cars are just not part of the solution. We have, 15% of India is today, motorized, yet we have such massive levels of pollution. We do not have the air shed nor the road shed.

So actually, India should be talking about reinventing mobility from the point of view of electric bicycles, for buses, for trams, for metros, we need to be talking about the kind of transformational action that we will take for our interests and show that the rest of the world is not doing enough. Today, the United States plan for 2030, and I have to say, I have been a long-term critic of the US. I came out very clearly saying that Biden's plan for 2030 is a game changer. He has stuck his neck out;

he has said 50% reduction; this is more than anyone has ever said. The US's entire position on climate negotiations has been to erase the concept of historical responsibility to do as little as possible at home and to point fingers at the rest. I think Biden has made a huge change. But when you look at the details of how Biden plans to reach 2050, you will be deeply disappointed. They have shale gas, there is no doubt that that switch from coal to shale, has given them an extraordinary advantage. Yet, even after the move to shale gas, you find that US emissions are up and not down. And this is because they are not transformational enough. So, Montek, my plea to you would be, please join our side even further, please argue for even stronger action. You and I have had many debates about this, and I think today, when you're halfway there, you need to jump full towards our side, so that we can really push for these actions not just in the interest of climate change, but in our domestic interest. Thank you.

Vikram Singh Mehta: Well, thank you, Sunita. I mean, it's always a pleasure to have you, and it's always a pleasure because you're as always, transformational in your thinking. And so, thank you. We will wait for Montek to reply for a while. So, I'm going to just turn down to Ambassador Shyam Saran. Shyam was the Foreign Secretary of India, he was the Prime Minister Manmohan Singh's Special Envoy for Nuclear Affairs and Climate Change. He chaired the National Security Advisory Board, and also, the think tank research and information system for developing countries. Shyam is a prolific writer and his contribution to public service has been recognized by the award of the Padma Bhushan. As you can see, I'm being very brief in my introductions, otherwise, they will take up the entire time. So, Shyam, I will just turn it over to you right now. Thank you once again for joining us today.

Shyam Saran: Thank you very much Vikram, for inviting me to participate in this very important debate. And I would also like to compliment Montek and Utkarsh, for presenting a remarkable paper, and I would say a paper, which is really very, very thought provoking, and very timely, because we will be soon gearing up for the Glasgow Climate Summit. And that is going to be a critical moment for the world, I would say, in terms of the much bigger challenge than the pandemic that we are facing. My perspective will be that of a negotiator. And Naushad mentioned the importance of building negotiating capacity, I hope that he didn't have my very low negotiating capacities in mind, because we have not done a very good job of actually, our negotiating strategy. Let me admit that straight away. But let me try and make a few comments, which I think are perhaps, relevant. One is that it has been mentioned in the paper that there is a certain traditional negotiating position that India has taken over the years, which is to resist any kind of pressure on us to reduce our emissions. That is true, but I would say that that is not India's traditional negotiating position. What India has been saying consistently for several years now, is that we have a climate change agreement by consensus, that is, the UNFCCC.

So, whatever we are asking for is not India asking for this concession or that concession or this position or that position. All that India has been saying consistently, at least at the negotiations, has been, please deliver on the commitments that you have freely made, not under pressure, you have freely made by consensus in the UN Framework Convention on Climate Change, and by the way, in Bali in 2007, you also agree, because of the IPCC report, that the situation was much worse than what it was when we negotiated the convention, and therefore, we need to enhance the implementation of all the principles and provisions of the UNFCCC. So, I think this is very important, again, in terms of negotiating strategy, it is very important not to acknowledge that, it is India's traditional negotiating position, that India has been taking this kind of position resisting reducing its emission, all that India has been saying consistently, at least at the negotiations is, that our position is that whatever has been agreed upon by commitments which have been made by consensus in those legal documents, should be argued. Have we gone against any of the commitments in those instruments? No. If anybody has to answer that these commitments have not been made, it is actually the Western countries.

So, I think this is a very important position to my mind, that I think we should not, somehow accept that narrative that here is a naysayer, here is a country which is standing in the way of the world being able to address the challenge of climate change. And I think Sunita's very nice, sort of volume, she has brought out on the climate change issue, has this very nice cartoon from the New York Times, where there is this huge Indian elephant which is sitting on the railway tracks, preventing the Paris Agreement from being taken forward. Believe me, this is the picture, which is going to be presented, it is already being presented, which is going to be presented as you come closer and closer to Glasgow. You are the naysayer, you are the bad boy, you are the villain, you are standing in the way of the world being able to deal with this challenge. I think we should understand this game. So, whatever has been put in Montek's paper, I think all those are necessary for us to do. But I think getting the narrative right, is also very important, particularly because you are looking at this paper for CoP 26. So, going up to CoP 26, what is the narrative which is being created? This needs to be understood, and we have to make sure that our narrative is the right narrative.

So, that's the first point I would make that with respect to the CoP 26 if we are talking about the commitments which have been made or the positions taken by different countries, frankly, India is not the country which has been standing in the way of any meaningful action on climate change. If you look at the India story, actually, the India story is quite good in terms of what we have been able to achieve. Now, the other aspect in terms of this narrative, is what has been mentioned about coal and I grant immediately that of course, we should move away from coal. It is very important, but that we should do for our own reasons, I think it is extremely important. Is it necessary to have the right kind of pricing mechanism for that? Again, I grant that. Those are specific issues. But let me tell you this. That if we are talking about fossil fuels, coal is only one fossil fuel.

As Sunita mentioned, there is shale gas, so here, you are showing the world, I am reducing coal consumption, but you do not say much about what you are doing with other fossil fuels. All you are doing to suggest is that I'm moving from a relatively dirty to a relatively cleaner fossil fuel, but you are using fossil fuel. Some people, because they have a lot of gas available, so, they can make that move. If I do not have that gas available, then there is a cost involved if I start making that move. So, it is very convenient for say, the United States of America, which is already retiring its coal-based industry or many countries in Europe as well, to say, coal is bad, most important thing is, let's move away from coal. Yes, of course, move away from coal. But as far as India is concerned, whatever decision we take on that, we should take on the understanding that if we are going to make this transition, how viable is that; do we have alternatives? So, those become important questions. The other aspect was that, this has been mentioned in the report, is extremely important that today, we have to acknowledge and it is possible for us to make the transition from fossil fuel-based growth, to renewable-based growth, to clean energy sources-based growth.

But I mean, if you are not talking about transformation, if you are talking about transition, any transition is going to require large amount of resources. And the poorer country you are, the more expensive it is for you to make that transition. So, in India's case, for example, even if you move to 2070 as the net zero, the kind of costs which have been talked about is something like \$150 billion a year or \$170 billion a year or 2.5% of the GDP as was mentioned, as well, this is a huge cost. So, even if technology is available, adopting that technology is not cost-free. And it has to compete with many other priorities that we have, in terms of our development. So, this aspect needs to be considered. And when we are talking about finance, I'm extremely pessimistic about any possibility of getting any kind of significant funding from the developed Western countries to meet even a small fraction of what we have to maintain. Because look at the record for example, even the five years from 2015 to 2020, \$100 billion per year. They have padded it up with including for example, foreign aid, they have

included private capital flows, they have also in fact, one of the papers suggested that the remittances which are coming to developing countries from developed countries is also a financial flow, so maybe we should use that as well. So, this is a mug's game. You are not going to get the kind of financial resources that are required in order to actually make that transition widely.

So, we have to accept that fact, because the record has been that those commitments have not been delivered on. And I would like to give the example of the 2007, 2008, when I was involved in the multilateral negotiations going up to Copenhagen. The whole situation was transformed at that time because of the global financial crisis. I mean, our Western counterparts were very, very frank, that it is simply not possible anymore for us to make the kind of financial commitments that was possible before the crisis. So, don't expect that there will be large amounts of money coming in. Today, the situation perhaps even worse, thanks to the pandemic. I think there is already excuse that this is imposing a huge financial liability on the developed countries, so, where are the resources going to come from? Private capital flows for green development is a very fine idea, but it comes up against the same kind of problems that are cited for even other financial flows that, is your IPR system good enough? Do you have attractive enough investment conditions? Do you have regulatory stability that for example, Naushad mentioned being very important? All those considerations come in. And lastly, let me just make the final point that as Sunita said, we keep focusing on these narrow areas with respect to the climate change, not recognizing that by now, climate change is only a small component of a much larger ecological challenge.

So, if you have the pandemic today, what is the pandemic showing? In a sense, the pandemic is demonstrating to you that climate change is not just with respect to temperature rise, it is also having feedback loops in many other domains. So, to try and fix one particular component, without looking at other components, is simply not going to work. You will need a much more comprehensive kind of approach to the whole ecological challenge of which climate change is a part. And the kind of international collaboration which is required, and if, for example, what Montek has suggested in the paper is to work, then, even this requires a level of international cooperation, a level in fact, of mutual trust, which is simply not there. If you look at just the response to the pandemic, which should have actually forced an international response, international collaboration, in fact, it has not. It has even in some sense, exacerbated the whole problem. You have the Chinese saying to the US that, "Don't think we will be cooperative on climate change and other things you can compete with us." These are all connected. We have to really, I think India has the opportunity for a leadership role in this, because nobody else is taking that leadership role.

Nobody else is focusing attention on that larger transformation that Sunita is talking about, because I think without that larger transformation, many of the things that we are talking about will simply not work. And if we are able to actually show that we are moving towards that transformation, give the lead to others in terms of making that transformation, then whether you sign on to 2050 net zero, actually, you will have been ensuring outcomes which will go far beyond this kind of a targeting. So, I would suggest to Montek and to Utkarsh, that perhaps it is time to look at that larger picture, or at least put what you have said in this paper in that larger context. Because there are too many feedback loops, there are too many inter-domain issues, which I'm afraid, we have come to a point where we simply cannot abstract from them. That's the message I would like pass.

Vikram Singh Mehta: Thank you. Thank you very much, Shyam. Okay, so, I'm going to turn to Surjit now. I should just say that we are running a little bit behind time and I discovered that we have in our audience, one of the foremost authorities in meteorology, Professor Jagdish Shukla of George Mason University, and I'm going to request him to comment after Surjit for about two or three minutes, and then, we'll leave it to Montek. We're running out of time. Surjit, of course, is our representative at the

IMF. He is the Executive Director on the Board of the IMF. He was earlier, a member of the Prime Minister's Economic Advisory Council, and he's been on a number of committees. He's a prolific writer, and I'm sure that he won't mind my saying that he's an intellectual polymath. I mean, his books have enlightened readers about be it the economy, electoral trends, and how to actually measure performance on the cricket field. So, Surjit, over to you. Thank you for joining us at this early hour, I should say.

Surjit Bhalla: Thank you, Vikram and thank you very much for inviting me to join this panel. I think at the outset, I should say this is a joint paper with a colleague of mine, Bhopal Singh at the IMF. Montek's paper, Ahluwalia Patel's paper has absolutely put out the right set of issues and presented in a manner that can be discussed, debated and policies developed from them. And let me just say and I will end with this same point. This paper has a lot of legs. And I wish it Godspeed. Now, I come out a little bit, I really admire the paper, Montek and I, of course, have talked about this and various other issues over decades. Let me confess at the beginning, that I'm much, much closer, maybe even identical to the points of view taken by Sunita and Shyam. Both of them will be shocked, I see, Sunita is already shocked. I don't think Montek will be, but and I have written at the fund, in every presentation, I'm going to steal from you guys, there's a paper coming out and you will see it has reflected very much on this. Look, this is a political game. First at the outset, it is in our interest, all panelists and the authors have emphasized to do reduction climate on an absolute basis, it is in our interest. It is not that we have to do it because of somebody else, we have to do it.

Now, the question is what should be the rules on which we negotiate? So, we do our own, absolutely, but we have to negotiate. And this is the most important point of the paper, I think, deliberately so, in Montek's paper, is the end on, we need finance and developing countries need more finance and others, and Shyam has just shown all the data. I mean, they talk, even the Paris Accord etc. They say historical responsibility is there, *yeh hai, woh hai* (translation: there is this, there is that), differential responsibility is there, and then even recommend \$100 billion a year by 2020; and here we are, at about 20 - 25 billion. And as Shyam said, they pad it up. I mean, this is a sham. How the developed countries are playing this game, needs to be exposed, needs to be discussed, and a path forward, taken. So, I think those are my outlines. I will now go a little bit specific. First of all, I think the paper was too hasty in getting away from per capita emissions, the historical stance that India has taken, that Montek had taken way back in 2008, 2009, etc., and all of us have taken.

And I think, we may debate, and we should debate, on what the weights should be to the various considerations in war. And per capita weight should not be zero, and historical disaster, that is, responsibility for taking away the carbon space from everywhere, should not be zero. As you can say, it's 5%, 10%, and we are working on one little analytical method to try and see how much each country should contribute based on the historical responsibilities and based on how much carbon space they've taken out. So, should not be zero, need not be the dominant thing, and that's to be discussed, but should definitely not be zero. Now, I want to come to various parameters, no matter what criteria you look at, we have done comparatively, very well, and this is what I think Shyam was alluding to. You take whatever statistics and I guess I immerse myself in statistics a bit too much, there's a German watch, which is one of the leading NGOs, also cited by Montek and Utkarsh, which ranks India in the top 10 countries for emissions control or mitigation.

And actually, it's in the top seven, because the first four are not allocated to anybody but it's no beef, it's their bill. So, that's one objective basis where they compare, and the US comes way down and other countries come way down. So, just look at it, it's a ranking, it comes out every year and we are ranked very well and better than most. When we look at per capita, you know how little we have absorbed, and on historical, you know how little we have contributed. And I suggested to this discussion group,

we are starting with 1960, let's not go back to 1775, let's go the 1960, when there was beginning to be an awareness, and then of course, Sunita was very much in 1991, you were buying here, and outline. So, what I would say is, first, let's take net zero. The concept is beautiful, imaginative. How much accountability is there for our country? We can come up 2050. As Sunita said, we're not going to be around, so nobody's going to point fingers at us, and there is no accountability on this. 2050, 2060, has anybody asked China what they are doing in order to get there? So now, let's look at what countries are doing for not their commitments for 2050. 60, but doing now, take data from 2005 to today. And what is the intensity or GHG of carbon use and output. Because you can't go just how much carbon emissions they are, and unfortunately, the IMF has taken the stars, you know, India's a third largest emitter.

And actually, it was that little statement from the IMF, that got me to really thinking and saying, this is a plot. Third largest emitter; these are official documents of the IMF. And I've said it at the board, I've said it everywhere, so, I don't mind in a public domain saying that this is one aspect of the approach. That is just completely wrong, and completely misplaced, and we have to get it right. So now, let's look at the second point, emissions. From 2005 to 2020, which I began to talk about, and practically every country in the world, including India, is around 40, 45%. You take the emissions intensity in 2005, you take the emissions intensity here in 2020, and you find 2019, to be precise, and you find everybody's declined by about 40%. Do you want some numbers? India's 40% lower. Sweden, Germany, 40% lower. China, 44% lower, but they were coming from a large base, USA, 40% lower. Get your pick. So, who's done what? Everybody's done the same, because we all recognized this is a problem, we are doing it, but somebody should be doing a hell of a lot more and they are not. And they need to be pointed out as to how. Now, we come to the most important part on how good.

So, we recognize as a problem, India on its own, has been doing very well, and the world has been doing reasonably well. Take your pick. How do we finance? That is a critical thing. Funds have to flow - you take 100 billion, 200 billion, whatever the number, 600 billion - funds have to flow to the developing countries. Fund slash technology tranche has to happen. I have a suggestion, and which I've shared with Montek and others, as to how we can begin to do this. And actually, it's very fortunate that Montek has written this paper thinking about these issues, because my suggestion has a lot to do very similar to the war on poverty, which the world and undertook, which the World Bank took the lead, and Montek was a lead, if you will, I think, etc., along with a few others, absolutely. But we need to think in those terms. And what did they do? The West outlined, the economist outlined, what should be done? Who should do more? Who should do less? And the money had to come. And they got the money to flow, to help, and there's a debate on how much it helped, didn't help, etc., whatever it is, this is a world war on climate change, not on individual countries, and for various reasons which have discussed, that the world war has to be led and financed by those who created the problem in the first place.

And as I said, I'm starting in 1960, not starting in 1775. So, the simple calculation and after this, I'll end, is that there's a carbon tax proposed by the IMF - \$25 per ton for India, 50 for China 75 for the developed countries. I disagree with Naushad that it should be the same tax, I think you said that, but if not, somebody said it should be the same tax. It shouldn't be the same tax. But what can be done with this, I think, the tax should be a lot higher for the advanced countries on the basis of the base tax rate of \$75 a ton for the advanced countries, they will raise a trillion dollars. Now, the rules of the game are, you do this to decrease carbon, then you can increase your subsidies, etc., domestically. All of this has to be shared within the country. So, one tax over here, and you can do transfers, etc. there. Now, I think this is a readymade formula for allocating 20% of the funds. And if you raise it to \$100, you get about 250, \$300 billion a year. 20%, \$200 billion a year. You've got a ready mechanism for

transferring technology/funding for the poor developing countries or for practically, 80% of the countries that need. Why not? What's the problem? So, you have a tax mechanism endorsed by the IMF, endorsed by various countries, etc., beautiful. Set the tax rates a bit higher for the advanced countries.

Actually, if you do the simple calculation, and I've done it and I've circled a little bit, happy to send, it turns out that the tax rate, carbon tax collected, versus the income, is the lowest in the advanced countries; it's only about 1.1% or thereabout. And for the poor countries, it's about 4% tax that is being suggested even with 25 and 50. This is inequitable; this is not climate justice, this is climate robbery. So, what we need, simple, we've got the framework, we've got an idea, we need the funding, and we know everything that needs to be done. We know it. Each individual country knows it, you can look at what they have done individually in their countries, not receiving any funding etc., they have decreased in the same amount as the Western world has done. So, that is inequitable, and I think we agree on this war, and we agree on where the money has to come from, or some of the money a large portion perhaps, and technology. And as Montek and Utkarsh's paper pointed out, technology is rapidly developing. So, it's very doable. All you need is a will and the intent and the transfer. I'll stop there. Thank you.

Vikram Singh Mehta: Thanks, Surjit. I did say that Dr. Jagdish Shukla is on and I will ask him to perhaps, give just a couple of minutes of comments on the paper. We have only four minutes left, if we will stick to the time. I'm going to request everyone to hang on for another 10 minutes so that Montek and Utkarsh can respond. But Professor Shukla, could you perhaps just very, very succinctly, give us your comments on the paper, please?

Dr. Jagdish Shukla: Thank you. Thank you very much for giving me this chance. There has been so much talk already about us versus them; India versus West, US, IPCC, that I'm a little afraid now because I'm sitting here in Washington and I don't want to be labeled as this guy from the west. So, I just want to tell you my credentials that I'm from a village in Ballia district of UP, and I go to India every year for the last 40 years. And for the last 30 - 40 years, I have been trying to help India against weather and climate facility. As Mr. Shyam Saran knows, I used to go and see him, "Sir, what can we do?" And, Montek Singh Ahluwalia and Ajit Seth. Of course, these people have helped me. So, I am still a member of the Prime Minister's Council on Climate. Of course, it's a membership on paper because the council member meets, except we met at the Paris conference. Okay, so, since I only took three minutes, I just want to tell you that as a previous author of IPCC, the lead author, especially on the climate modeling report, these IPCC projections, they're being labeled as economic or political. No, they're purely scientific exercise. We made the projections, and then the leaders of the country have to approve that. So, it's finally approved by 195 countries.

So, this conclusion that 2050, it's not a political statement. What we have done is that, if you don't do, this a purely qualitative calculation. If you don't do, it will be so much harder, absolutely so much harder to make sure that the temperature is maintained below to 2 degrees. And Montek, everything that you asked of IPCC, it could be done. We did a very detailed calculation after Paris conference for every possible trajectory, we'll do it again, after CoP 26. It's doable, some of the things have already been done; we know already that we can never reach 1.5 degrees if we don't do something between now and 2030. So, rather than talking about them and us, let's talk about us. What is it going to do to India? I think that we know the impacts are far worse than IPCC said. IPCC is a very conservative consensus organization. You can see it's only 195 countries can agree. Leading scientists have analyzed what will happen. The heat waves will be so intense people in Delhi, Jaipur, and Varanasi, will have many more days of 45 degrees' centigrade temperature.

And I will just tell you one simple quantity called, Wet Bulb Temperature. Wet Bulb Temperature is simply, you take a thermometer, you test the air temperature, then you wrap around your wet towel around that thermometer; that's called Wet Bulb Temperature. It just means that if the air is moist, what is the temperature? If the wet bulb temperature gets 35 degrees, you die. This is proven by medical science. And if you look at one of the scenarios of the US and Saudi Arabian projections of the high scenario, India will have many places, especially in the monsoon season, Western Gulf, Kolkata, that area, where the wet bulb temperature will be 35 or more. So, I really don't think that we should talk completely about money and savings, we should also talk about, what is the suffering? And we always use this argument of "per capita," I find it a very weak argument, because atmosphere does not know how to divide numbers. Okay. atmosphere doesn't know how to multiply numbers; atmosphere only knows how many molecules are there. India remains the third largest emitter. So, rather than going back, what should we do? What do we need, and blah, blah, blah? Let's talk about future. Why can't we be the leaders of the world? Why do we have to say, "Oh, China did this, so, we have to do this?"

Now, we had leaders of the world in the past, who can be leaders again. So, since time is very limited, I just want to say two things about the paper. First of all, Montek, thank you for sending. I read very carefully, I'm so glad that this paper was written because as Sunita said, this is different from everything else that with time, I have met in the Ministry of Environment, Forests, and Climate Change people, they just speak a different language. It's the language that Mr. Shyam Saran was using. That's a different language. This paper gives a new language and the very fact that it can be done, is just such an amazing thing. My biggest disappointment was, which many people have said Mr. Bhalla also said that, if you read the paper, I was getting so excited about reading it; every page, till I came to the last. I said 2070. Why 2070? The amount of material in this paper says that if there is a will, it is quite possible to do the same thing by 2060. And your list will make an ambition the policy will not follow. So, our starting points should not be what West did, what America did, but IPCC is doing in a political organization. Our starting points should be, what can we do for humanity and what can we do for India particularly? Because it is our problem. We connect with less complain about other people; but it doesn't help, because those who emit more also have bigger guns.

Okay, so I mean, if we don't stop anything, then, they will also start charging tax on our stuff. They've already started talking about it, you must have heard that. So, we really should take the view that where we are today, and what is the best the truth? I think we can be example for the world, rather than just complain on a cheaper to work. So sorry, I didn't have enough time to justify many of the things that I'm saying, but Mr. Mehta, because you said there's a very limited time, I just wanted to get all my points out, and thank you very much for the opportunity. And I really appreciate your timetable. [crosstalk]

Vikram Singh Mehta: Thank you so much. I am grateful for your comments. Thank you. Montek, without further ado, I have to leave the fight last, whatever number of minutes you prefer to respond to absolutely, phenomenal discussion.

Montek Singh Ahluwalia: Actually, it has been, I think it's what they call a very rich discussion. Because it covers such a really wide canvas, that I'm only going to make a few comments, none of which do justice to the feeling and the involve each of the participants. One is, as far as your shots comment was concerned, then, I mean, I completely agree with him that somewhere out of this agenda, there should be something which says that India's industry should be competitive through this turn around, and I think there is an issue here he himself referred to that we will have a tendency to convert any major initiative into something that should also imply making in India. I mean, that would certainly be true of electric vehicles, most of all, it could be tray of batteries, it is true of photoelectric cells, etc. Here, I

share his concern that the quality of state capacity in being able to design an ideal way of doing it; is very dubious and doubtful. But I think what some of these larger issues, that is, what is the policy that we will follow on electrical vehicles, as well as on batteries?

We need to have a sort of, an in-depth view. It seems to me that we cannot be having an electrical vehicle industry, which relies entirely on imports of components. Now, at the same time, as happened in the case for Maruti sort of, directed some kind of understanding that the main producers are going to develop a component industry, can in fact, come about. I agree with what he said that, if we try to achieve this through incentivization, but subject constantly to international competition, we will be much better off. If on the other hand, we simply say we are now going for renewable electricity, therefore, we need a lot of photoelectric cells, therefore, we will slap on a 40% duty on these. I mean, that'd be disastrous. It's not in the scope of this paper to go into that, because that's a general issue. But I think that's a very important issue, and what it suggests is that as we push for a much greater expansion of renewable electricity, there will be the danger of being hijacked into what is essentially an inefficient domestic competition, uncompetitive domestic industry.

He did mention that he was not a great believer in making changes gradually. And I agree that in our own past history, there's some things that we did very quickly and we got it done, and there are others where you get a lot of traction if you do things gradually. My guess is that, if it's electric, if it's railways tariffs. I would recommend the gradual and announced rationale for the increase in tariffs but accept the fact that they will be gradual. Any sudden effort to jack up railways' tariffs will only lead to a lot of protests, which I don't think you really want. On Shyam, I think Shyam made two points, one of which I don't fully understand because what he said was that, we're only on asking them to fulfill the commitments they made at UNFCCC, I am not sufficiently knowledgeable. So, I'm going to check with them separately, what commitments did they make on UNFCCC, that was specific enough to say that you guys aren't delivering? I mean, it's absolutely true that they totally failed to deliver on the Kyoto Protocol. I mean, the Kyoto Protocol was born out of UNFCCC, it embedded the common but differential responsibility by saying obligations on developed countries, no obligations on developing countries.

And of course, it just didn't work after the first commitment period was over. The US actually withdrew from it after having signed it; they never ratified, couple of other countries left and so on. But to my mind, it's not very useful going back in the past. I mean, the truth of the matter is, in Paris, one way or the other, all our governments agree that we're going to make some commitments. The only difference was, they were not commitments that were calibrated to achieve global targets. So, we conceded the point that we are going to make some commitments, we call them NDCs. The issue now is, should we just keep saying NDCs and make no commitment whatsoever? I agree with what Sunita said, that a common 2050 doesn't make sense. In fact, it's very clear in our paper, that we should actually say that quite clearly, and say the climate justice means differentiated. Some guys get there faster, some guys get there later, and we can negotiate what the time is. But to my point, my view is, if we go into CoP 26, we have all kinds of things in mind, but we will not tell you what our trajectory is, I don't think we look very sensible. And people will be able to make us look less convincing than we ourselves think we are. So, my view is different.

My view is, whatever happened in the past, we should say, "Look, we've seen our capabilities, we know what renewable energy is possible. This is our trajectory, take it or leave it, but that's our trajectory." At least nobody will be able to say that India doesn't have a trajectory. If they criticize that trajectory, then we can go back to say, "Look, how much carbon space is that occupying considering what you did historically?" I mean, all the things that Sadiq Bhalla rightly raised, because the moment you invoke the history, there's no question that the developed countries are on weak grounds. But we're not

engaging in a debate here. I mean, we're really trying to see whether we can move the needle forward in getting an agreement. This is also where I don't agree with Shyam, that we should put it in even, I mean, climate change is a big enough context anyway, as you can see from our paper; the number of things that get covered is huge. But he suggested that we should make it even more global and take a larger No. I really don't. I mean, that's a UN General Assembly kind of discussion. It's not in my view, something that makes sense from a negotiating style standpoint.

Now, the question is, I mean, I wouldn't go into what everybody said, maybe I'll ask Utkarsh if he wants to comment on some of the specific points. I genuinely agree that we should have a carbon tax. Surjit also seem to think it was a good idea and the resources that it can generate can be a source of funding? But my most important point is, frankly, that I think the global community needs to come clean on one issue. Is it only planning to help the low-income countries in Africa, which is fine, I mean, they deserve help, they have a very special problem? Is it saying that the middle income countries do not require any financial initiative? Now, frankly, we ought to go there and say, Look, this is our trajectory. And internally, it should be our trajectory. I think someone made the point that we should do it ourselves, not because of some global negotiation, that's absolutely correct. But what we should say is, look, this is what we plan to do. We will not make it an international commitment, unless it's part of a financial package, which is attractive.

I mean, they completely bamboozled us on the Paris Agreement, because that \$100 billion is nowhere in sight, so Surjit was right in complaining about that. So, this is where we should go in now and say, "Look, for the coming CoP 26, let's recognize what the scale is. And 100 billion dollars simply isn't in line with scale, especially since it wasn't meant to be just multilateral. It included all kinds of private flows". So, we should indicate that, "Look, we do need a lot of private flows; we will try to get a lot of private flows. Whether those flows come or not, is going to depend on the kind of investment climate we create. This is the point we make in our paper, that electricity has to be sold to the discount, and all the discounts are breaking, it's extremely difficult to believe that you're going to get a lot of investment in an environment where the buyer is broke. That's our job, we have to do something about it, conduit immediately. But bringing the multilateral banks in, gives an opening that people will kind of try to find ways of leveraging more private flows.

And to my mind, we should be willing to say that CoP 26 is a complete failure if a sensible agreement on financing is not reached, and that's not 100 billion that be for the multilateral development bank's itself, it would be probably two or three times that amount. And nobody will be able to say it's because India doesn't have a trajectory; we have a trajectory. And if somebody wants to criticize that trajectory, you don't even discuss that. Because otherwise, all we'll be doing is going there and saying, we have no trajectory, and we want some money. And that's a no brainer. In Miami, it just doesn't make any sense at all. So, I've left out, I'm sure a lot of things that I think about them and reflect on them and probably take them into account when you finalize the paper. But that's my reaction, I don't know if Utkarsh, you want to say a few things on things I may have missed. I don't know specials are online. But if he is, can you come in, please?

Utkarsh Patel: Yes, thank you, sir. I think you've covered almost everything. But in the interest of time, whatever the means, I would rather write, send my responses in writing.

Montek Singh Ahluwalia: Okay, yeah.

Vikram Singh Mehta: I'm really delighted that we've had this, as Montek said, very rich conversation; first and foremost, my gratitude to Naushad, Sunita, Shyam, and Surjit, and of course, thank you Professor Shukla for your brief, but very powerful intervention. Clearly, all this is not possible without

Montek and Utkarsh's is paper and you can understand why CSEP is so delighted, so privileged in some senses, to have these two individuals on our faculty. And I do hope everyone who's listened in, will agree that there is real value in having an independent, neutral forum to discuss issues that are contentious, but of enormous policy importance. So, ladies and gentlemen, my grateful thanks to every one of you, and I hope you have a good night or good evening or good morning. Surjit, good morning. And thank you.