

Panel Discussion

Are we running out of gas?

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Reshaping the world of energy: options & actions; inconsistencies, conflicts, costs & deficits of current energy policies

60 years ago Mahatma Gandhi asked the question: „How many planets will it take?“. He was referring at the time to a particular dilemma of that age when Britain was the dominant economic power and India the potential rising giant. How many planets will it take, he asked, if India follows the path of industrialism that Britain has taken that has consumed half the planet’s resources, if we were to substitute the current realities? We have already heard this today, and last night at dinner where Professor Deutch invoked the same question in different form. How many planets will it take, if China follows the American model of development? If every Chinese of the aspiring middle classes of whom there are hundreds of millions, gets a “gasguzzler”, gets on the road with the same kind of urbanisation, motorisation, industrialisation path that North America has pursued. How many planets worth of resources will it take?

That is the question in essence that we are here to grapple with. But, at least in one part of that question, implicit in that, are the energy resources. You have heard two eloquent speakers and have a sense from others who spoke that the world is not constrained in terms of energy per se, but that it is rather the ways in which we use that energy, the consequences of our energy use that is worrying. So I want to argue too that what we need is actually a paradigm shift. Fundamentally I argue that even though we are not resource constrained per se, the fundamental basics of the current energy system are unsustainable, and they are unsustainable for three reasons:

First, we of course talked about the linkage between energy and the environment. The emphasis has been on carbon and climate at this conference, but of course the needlessly inefficient and dirty ways that we use energy today also contribute to local pollution problems, and that continues to be the case, particularly if you look at developing cities. China has many of the world’s dirtiest cities. When you look at local pollution, again this has a lot to do with the particular ways in which we combust fossil fuels. But it is not just the air pollution that we are familiar with or the climate question which we are here to discuss in detail at this conference. There are environmental problems that do not even appear to be related to energy that I would argue can be obliterated by a shift to a more sustainable energy paradigm.

Let me give you a couple of examples. Many people talk about water as the next world crisis, and people sometimes even argue that the next world war will be because of water. Maybe because I am an engineer I tend to look for technical solutions to problems, and I am a little surprised when I hear talk like that about water. I look at the earth and see an earth covered in water, 70% in water. Although it is not what we want it to be – it is salt water – we know how to desalinate, we know how to move water. If push comes to shove, this is not a problem at the conceptual level, the way for example HIV or some new unknown epidemic is that might arrive and has the potential to kill tens of millions for which we might not find a vaccine, a

remedy in time. Fundamentally this is a question about political will and that is a different nature of problem. But if we use desalination, it is very energy intensive, and if the energy used is dirty energy then all we are doing is shovelling problems from one side of the ledger to another. Similarly other environmental problems that appear to have nothing to do with energy, for example recycling or dealing with chemical waste, would become much more manageable if we were to get access to cheap clean distributed energy. In other words, getting energy right is the essential enabler of sustainability, I would argue on the environmental front. And to put it the other way around, without getting it right we have no hope of having a sustainable future. That is one link, energy and environment.

The second link is energy and poverty. On the estimates of the International Energy Agency, 1.6 billion people on earth do not have access to modern forms of energy, be that electricity or other forms of clean burning energy. Most of these unfortunates live in sub-Saharan Africa, southern Asia, parts of Latin America. They walk, usually it is women and girls, walk miles a day to fetch agricultural residue, cow dung, I mean really filthy, solid inefficient forms of fuel that burn in a makeshift cook stove in their huts. Often children are in the huts at the time when this happens, and the resultant smoke and indoor pollution according to the WHO and various other measures is one of the leading preventable causes of death in the world apart from malnutrition. But when was the last time you heard of a live aid concert to stamp out the cow dung fires in India – even Angelina Jolie doesn't care, because it's not a sexy issue. But if we think about the human condition, if we think about how we can get along in this world in the future, think about an energy system that meets the needs, not only of the world's wealthiest, but of the most needy, and of the most aspiring, that are now making their way from one part of the ledger to the other; in Brazil, Russia, India, China, the so called BRIC countries.

You see that this is, this must be front and centre of meeting the need of energy poverty. If the current energy system fails, the IEA forecasts that the population living in energy poverty over the next 25 years will actually increase significantly, not decrease on current trends. That is not sustainable.

And the third link of course is energy and geopolitics. We heard very eloquently from Professor Deutch that the aspirations of particularly China are leading to a scramble for resources. I do disagree with Professor Deutch - I'm sorry he is not still here – on some of the consequences in terms of whether acquiring oil assets overseas by China, India and other countries, although they are paying for them, actually matters very much in terms of economics, or of the fundable global commodity. The more oil that China owns and invests into pump it out, means that China will demand less oil from the globally traded oil market, leaving more for everyone else on the world market.

But nevertheless, it is undeniable that he is right about the geopolitical tension that this will cause, particularly if China, India and other countries approach African or middle eastern countries where the U.S. has existing geopolitical alliances. This is clearly an area of potential conflict in the future, rightly or wrongly, and partly wrongly in my judgement, but this is going to happen.

So I have given you three examples that have nothing to do with depletion or scarcity, why I think that the existing inefficient approach to using fossil fuels primarily

is not sustainable. I share Professor Lackner's view, however, that fossil fuels can be part of a sustainable future if done in a carbon constrained fashion, and many technologies can be part of that solution. I am not anti fossil fuels at all – on the contrary. My argument is that the current paradigm is not sustainable. But I do not want you to think that I am a pessimist, and we are here to talk about solutions. In fact I am an optimist. I argue that there are three reasons why there is more hope in the energy world today. Then I would argue that in a hundred years we are entering an era of great innovation, of the sort that we have not seen since the days of the arrival of the internal combustion engine, developed of course here in Germany in part, and France. And also of Thomas Edison and the arrival of the first heated light plant near Wall Street.

Today we are entering another era of energy innovation, for three reasons. The first reason is the trend we observe over the last couple of decades towards a liberalisation of markets. Why does that matter? Well you might say, a man from 'The Economist' would say that wouldn't he? Indeed, I do argue that competitive markets are better than the alternatives, because over time they lead to more efficient outcome, but that is not my point to you today. For the purposes of our conversations, I argue that liberalisation is the essential enabler of innovation in energy. And energy so far is the least innovative big business on earth. Now, that is a big claim, but let me give you just one small statistic to back it up and there are many others, I am happy to refer you to.

If you look at the U.S. electricity industry, on many measures it is a vast enterprise. On revenues, it is a bigger business than the U.S. long distance and cellular telephone businesses put together. On assets it is even bigger, it is a serious enterprise. On the estimates of the industry's own experts, they reinvest less than one half of one percent of the revenues into research and development, less than one half of one percent, that figures the truth for decades. If you look at any vague enterprise, whether they are biotechnology or IT or computing or others, as much as 5%, sometimes 10% of the turnover is being reinvested. In the energy industry, however, we have seen a "business as usual" mindset that has actually been anti innovation. Liberalisation changes that paradigm, the two guys in a garage who created Hewlett Packard, well, I want them to be working in clean energy and coming up with the next innovations. In terms of how we organise the marketplace, I want Professor Lackner and his colleagues to see some rewards that are there for bringing their ideas from the laboratory inside their heads to the marketplace that changes the world. Liberalisation begins to make that possible, but only when combined with some other trends.

The second big mega trend that gives me hope is the rise of a new kind of environmentalism which first of all is a market-minded environmentalism. We see an embrace of sensible policies rather than the old paradigm of left versus right, of environmentalism versus business. We are seeing market based instruments, whether it is carbon tax or other kinds of pollution taxes, which provide incentives in the market to clean up your act, to emissions trading which the U.S. pioneered with its acid rain trading program for SO₂ and which Europe is now taking to the next level. It fits and starts with carbon trading, and with the European trading system. I think this is an extraordinary advance, because it makes possible to reconcile a lot of the political tensions between left and right in business and environmentalism that had led to something of a logjam on working at the environment. And this is evident in

developing countries. In fact, if you go to Beijing, Bangalore or Brazil you find a very high level of environmental awareness. People are rich enough now in many parts of the developing world, particularly urban clusters, to be able to afford to look beyond their next bowl of rice. And you are seeing very sophisticated environmental activism, regulatory thinking and the potential for leapfrogging which I think is really a way of addressing developing countries. It is not inevitable that China must follow the path that the U.S. has written in stone. And history says economies can move faster in terms of efficiency, in terms of decoupling energy use and carbon emissions growth. The leap by many African and Asian villages to cell phones rather than getting conventional land telephone lines is the most dramatic example.

The third mega trend, and I will close with this, is technology. We are on the course of a clean technology revolution in energy, and, as I say, of the sort we have not seen in a hundred years. We see the arrival of clean carbon technologies and the incipient introduction of technology policies around the world. This is not a done deal, but what I do see in the years that I covered these issues for the *The Economist* also in historical perspective, is that the third great wave of technology really has the potential to change the paradigm.

Now, what does this lead to? With these three mega trends combined I think we have the chance to set the world on a much more sustainable energy footing. The future development is not inevitable; it depends on choices, choices that we make in this room, choices that policymakers in the rich world as well as in the developing world make about the direction of those three mega trend outlines. Technology sometimes emerges spontaneously, innovation often happens in the marketplace, but is not always green. Take, for example, the SUV – the Sports Utility Vehicle, the Goliath, like the Hummer that Americans love to drive – very innovative, but no one would say that they are green. Innovations are not necessarily going into the most sustainable direction, unless public policy enters the play, which would be my idea to you. So in closing I answer Ghandi's question by saying: Of course we have only one planet, and we must meet the legitimate needs of the developed world, as well as the legitimate aspirations of the developing world with the resources that are available including the environmental strains that are implied by those resources. But we are not resource constrained neither in terms of primary energy nor in the resource that matters most of all, which is human ingenuity. Thank you very much.