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We have been talking about carbon prices and financing issues to reduce emissions in developing economies. I think I can provide with my opinions in this presentation. Humans evolved into a new species as they learned how to use fire and tools and those tools began to be energised by fire in the steam engine period, and that empowered labour productivity to a dimension far beyond our physical limits. Human beings also obtained the knowledge, the wisdom, of how to store, which became the source of ever-expanding human greed.

Therefore, with tools energised by fire, greedy mankind has built up astounding prosperity, on the one hand, and degraded the environment to the level of destruction, on the other, so indeed the wisdom came from forbidden fruit, and Prometheus was punished by Zeus. Now, Mother Nature is striking back through global warming. Therefore, we have to build a huge Ark to save our globe, and the sooner we do this the better. International cooperation will be needed to build this Ark, which may not show up by itself due to market failure. We must obtain a fourth wisdom, I call it self-restraint, in the detailed form of a global agreement.

What will the wisdom of self-restraint consist of? It must establish incentives for individuals to reduce emissions of greenhouse gases and provide technologies to this end. It is very simple. This will happen in two ways, one being institutions which will make everybody accountable and responsible for her or his greenhouse gas emissions, and the second being the reformation of energy systems to improve the efficiency of energy use and replace fossil fuels with renewable resources.

Regarding the institutions, I am talking about the emissions trading system. Many people have talked about carbon pricing and taxes, but the market will also determine carbon prices. We must find out the total amount of emissions allowable in view of the targeted rise in temperature, then assign a cap on each unit of emissions that will add up to this target amount, and allow trading of assigned rights. This is the basic principle; the problem is how to allocate those caps. I thought about two principles, the first one being equal reduction. Each agent reduces what it is emitting now by the same rate, and I think most advanced countries would prefer this option. The second one is equal emissions: since emission is a fundamental right of human existence and activity, this right should be distributed equally throughout the whole of humankind, so an equal cap should be assigned to each human being in compliance with the target. I think developing economies may be interested in this principle.

Equal reduction will minimise disruption to current production systems, but obviously it is not fair, as it favours those who are responsible for the already prevailing stock of greenhouse gases in the atmosphere. Equal emission is fair, but will definitely disrupt the global economy, creating a deep recession for some time at least. A consensus is desired on a globally agreed principle, since the intrinsic nature of greenhouse gas emissions is the biggest market failure in human history. The Chairman seems very pessimistic about such an agreement, and that may be because he is an economist, but I am also an economist and I think we can make it.

My proposal is to start with equal reduction with grace period during which the scheme could gradually shift toward equal emission, so let us start by minimising the disruption to the current system but moving to the fair system after some period of time. Developing economies are likely to sell their rights to advanced countries who are big emitters under this regime. Developing economies will be paid for this, but they are not to use this money at their will; they are required to spend the revenue from this trading only for licensing green technology, and then the scheme will guide concerned human efforts exclusively to fighting global warming. It may solve the issue of financing green growth for developing economies.

Regarding the reformed energy system, we have to improve energy efficiency. Greenhouse gas emissions are mainly from energy consumption, as you all know, and incorporating smart grids and energy management systems will enable smart energy conservation, making use of contemporary ICT. This idea faces huge resistance because it may not protect private information, the same issue raised in big data analysis. Smart grids will smooth out the wayward inflow of renewable power generation into grid systems with the help of energy storage systems, maintaining system security and saving energy.

Regarding the rearrangement of regulations and systems of electricity supply industry, smart grids also enable power consumers to respond to market conditions in real time, and the law of supply and demand will work even in the electricity market. Opening the electricity market to competition will achieve further improvements in efficiency. Conventional institutions, regulations and business customs must be realigned to this new environment in order to voluntarily realise efficient use of electricity.

How do we expand renewable generation? This is done with public subsidies. In many cases, as many of previous speakers repeatedly noted, it is not currently profitable. However, the cost of renewable generation has been declining very rapidly, although it still falls short of standing alone. Renewable generation also needs backup when generation is not possible; for example, night-time solar generation is impossible. There are many conflicting conjectures about the future of fossil fuels, but I expect competition between renewables and fossil fuels to intensify itself. Mr de la Noue said that the current fall of oil prices may reverse because the shrunken investment may generate a shortage in supply in the near future. But the current fall in fuel prices may have been caused by the pressure from global warming as well - that might be the case - and expanding renewable generation aims at reducing the generation of power from fossil fuels. That is very obvious.

The development of shale gas has accelerated the fall in oil prices, weakening the competitiveness of renewables. Oil is likely to dominate another century, but global warming will also expand the use of renewables. What I expect is not complete replacement of fossil fuels but some substantial portion of energy consumption being covered by renewable energies. That is a reasonable conjecture for the future. Competition for cost reduction between oil and renewables is likely to intensify, and I think this is very good.

Coal is likely to disappear, and I hope in particular it will disappear from generation, though many of you may not agree. Disruption of electricity supply systems by extreme weather events would cause damage on a larger scale if larger generators and high voltage grids are hit, so decentralising generation is more likely to result in smaller damages; that fits with wise adaptation strategies. Expanding renewable generation into nearby load centres must be encouraged.

If we have new energy systems, new tools which fit to new energy system naturally show up. Electric vehicles will lead e-mobility by substituting electricity for gasoline, and if the electricity is generated from renewable resources, then electric vehicles will make an accelerated contribution to mitigating emissions of greenhouse gases. Electric vehicles may act as mobile energy storage systems with a proper vehicle-to-grid infrastructure, enhancing the accommodation of renewable generation. This of course is for the long-term future, so is mainly about imagination and hope.

However, what is ultimately needed is for everyone to be made accountable and responsible for the greenhouse gases emitted by his actions. That may fit with the proposal that we should attain the wisdom of self-restraint to voluntarily reduce the emission of greenhouse gases.