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Remarks on receiving the Nobel Sustainability Trust - Technical University of Munich
Sustainability Award for Leadership in Implementation

The NST-TUM Award for Leadership in Implementation is a great honour for which I am immensely grateful. Thank you Eugenia da Conceicao-Heldt for your very kind words. It is a privilege to be here in Munich, at the TUM, and to be with the Nobel family. My deepest thanks go to President Thomas Hofmann of the TUM and to Peter Nobel, Chair of the NST. It is a pleasure, as former President of the British Academy to be here in the Bavarian Academy. And it is an honour to be alongside the very distinguished Professor Elena Bou. I am very happy that my colleague Bob Ward of the Grantham Research Institute at LSE is able to be with us today. We have worked closely together over many years.

I have been asked to share reflections on the development of my ideas and policy engagements, particularly in relation to implementation of action to manage climate change and to promote sustainability implementation.

Implementation requires an understanding of, and strategy for, the profound changes we must make in the economies and societies of the world. My own subject, economics, given the immense and urgent challenges the world faces, should be providing serious and constructive analysis that can inform and shape strategies for the fundamental and rapid transformations that are necessary.

Let me begin with some thoughts on how to analyse the challenges that flow from climate change in terms of: reducing emissions, that is mitigation; managing the consequences that cannot be avoided (adaptation); and promoting economic and social development. We can and must pursue all three at the same time and many relevant actions and plans can indeed promote all three simultaneously.

Identification of strategy is logically prior to implementation. A proposed strategy has to be well-founded, feasible, clear, and convincing on what it can deliver and what is required of us all. For my own work, the foundation of the necessary analyses lies in the economics of development and societal change, on which I have worked all my professional life of more than half a century. The analyses will require an examination of the meaning of sustainability, an understanding of the implications of the science of climate change, and a recognition of the power of innovation and

technology. Sustainability means offering the next generation opportunities at least as good as our own, assuming they behave in a similar way in relation to those that follow. It requires investing in the four types of capitals which shape their future: physical, human, natural and social. I will not dwell on the science, but it is clear and strong that delay is immensely dangerous. We risk destruction, conflict and death on a huge scale. We must transform our economies towards zero-carbon at great speed. We have left it late and that has made change more difficult but there is so much we can do to radically reduce risk and manage the risk that is now unavoidable. The next decade is decisive if we are to keep the Paris goals within reach.

My work on combining the economics of climate change with that of sustainable development goes back almost two decades, when I began work (2005) on the Review of the Economics of Climate Change, whilst at the UK Treasury and in the position of head of the UK Government Economic Service. I had just come from being Chief Economist of the World Bank. Prior to that I served as Chief Economist of the European Bank for Reconstruction and Development (EBRD), which was focused on the transition of economies from central planning to market after the fall of the Berlin Wall. Most of my working life has been as an academic economist, mainly at the LSE, but including academic institutions from MIT, to Oxford and Warwick Universities, College de France, to the Indian Statistical Institute, and to the People's University of China. But I have spent long periods in the kitchen of policy making. That involvement in policy action underlined for me the importance of clarity and sound analysis in successful practical implementation. There should be no tension between the analytical and the pragmatic. Quite the opposite.

Having emphasised the importance of economic analyses in understanding the issues and informing policy, we must recognise that there have been real problems in the way the economics of climate change developed in the fifteen years or so from the early work in the 1990s to the late 2000s. A few moments on some technical but important economic issues. In large measure the economics was dominated by two approaches: first, a simplistic view that policy should be determined almost entirely through a carbon price (the tradition of Pigou); second, a reliance on standard general equilibrium growth models (Integrated Assessment Models, or IAMs) in which damages from unmanaged climate change involve small losses of income far in the future, where technical change is weak and exogenous, where there is no structural change, and where there is very limited scope for analysing distribution. The first, the narrow focus on carbon prices, is misleading because there is a whole range of highly relevant market failures that must be tackled in addition to the emissions of GHGs. These include issues around R and D, capital markets, networks, information, and the

immensely damaging pollution beyond GHGs, which arises from the burning of fossil fuels. All of these require public policy action alongside carbon pricing. In addition, we must recognise that crucial markets are absent, including for future technologies. And, further, we have to recognise the crucial roles of increasing returns to scale and great uncertainty, which often imply that effective public action requires standards or regulation beyond price-based policies; yet policy modelling often excludes increasing returns and downplays uncertainty.

The second troubling feature of early work, the dominance of IAMs, is that such modelling approaches largely exclude, in their construction, the four key issues of immense risk, structural change, endogenous technological change, and income distribution. Much of my analytical and conceptual work has been in trying to move economic analysis in a sensible direction so that it tackles these four key issues directly and explicitly. These issues generate a rich array of questions and paths for research, policy, and implementation.

Further, we now see that the transformation to the zero-carbon economy, can not only drastically reduce and manage the immense risks from climate change, it can also set us on a new path to growth and development which is much more attractive than the dirty, destructive models of the past. It includes cities where we can move and breathe, ecosystems which are robust and fruitful, economies where innovation flourishes and is focused on sustainable development in all its dimensions, and an economy which is much more efficient in the use of all its resources, including energy. Understanding the extraordinary potential of this new path and realising the necessary investment, innovation, and structural transformation to drive it forward must now move to centre stage.

The transformations we must make, and the management of systems and of systemic change can and should be strongly boosted by artificial intelligence (AI). It is strengthening precisely at a moment when its power is needed to help manage the transition.

This set of issues is the research and action agenda on which I have been working for the last decade or more, one that is reflected in my book “Why Are We Waiting? The Logic, Urgency, and Promise of Tackling Climate Change”, published in 2015. Pursuing that agenda is not only where the logic takes us, but it is also crucial for sustainable development and poverty reduction. And it is good politics; the new route does indeed require major change, but it also brings real hope. The drivers of growth come from rapid innovation, increased efficiency, better functioning cities, energy, transport and land

systems, much better health, and from the investment itself. Economics must embrace these drivers, but so many of the standard general equilibrium models that are employed are largely, through their assumptions, silent on these issues.

Over the last several years, I have been working on the implementation of these new approaches to growth and development, much of it interacting with international institutions, including the Multilateral Development Banks (MDBs), the IMF, the UN/UNFCCC. I have also been interacting strongly with developing countries, where my work on economic development began, including Kenya and tea in the late 1960s and India and wheat in the mid-1970s. My primary concern has always been on how economies and societies can change, and living standards, in all their dimensions, can rise, particularly for poor people. It is that set of interests and priorities, and an increasing realisation that climate change can derail, disrupt, and destroy development, that led me to work on the economics of climate change. There is no horse race between development and poverty reduction on the one hand and environment and climate on the other. On the contrary, action on one drives the other forward.

In recent years, my work has focused on the challenge of bringing forward and financing the investment necessary to drive change, bring down emissions, adapt, and to realise the new growth story. That has been largely at the international level and the study of how to foster and support change in emerging market and developing economies (EMDEs). It is here where output, and potentially emissions, will grow strongest, and it is here that the challenges of adaptation and resilience loom largest.

Poor people are hit earliest and hardest even though their emissions have been lowest. The world must seek a just transition both across countries and within countries. The word “just” is often used loosely, and we should be careful to be clear on meaning. Injustice is a right denied, as Amartya Sen taught us so clearly. The most important right here is the right to development. Rich countries, by their past and future emissions have damaged and will damage, rights to development. Given their role in emissions and their relative wealth, they have a responsibility not only to cut their own emissions strongly and quickly, but also to support and help finance the investments and innovations of poorer countries, and to share technologies.

The EMDEs have a real opportunity to develop along a different, healthier, more biodiverse, and productive path than that followed by richer countries. But that path can be realised only through strong investment, and with substantial financial support from outside.

The necessary increase in investment is large. The world as a whole must raise investment as a percentage of GDP by around 2-3 percentage points and EMDEs by 3-4 percentage points, if it is to keep the Paris goals within reach. My colleagues and I have been working, for the G20, the MDBs, and of the UNFCCC COPs, on how that can happen. Our approach is deductive: from the goals, to the investment to the finance. I have been working particularly closely here with Amar Bhattacharya. We must also be clear that keeping the Paris goals within reach is a major factor in the delivery of the Sustainable Development Goals (SDGs). And we must recognise that pursuing the Paris goals and the SDGs will have to place biodiversity at centre stage. It is intertwined with both climate and the SDGs.

Working analytically in this way we reach the quoted necessary investment increases. On reasonable assumptions about the potential of internal savings, we conclude that the flows to EMDEs (outside China, which does not need external financial flows) should reach \$1 trillion p.a. by 2030. Of these, given the varying nature of investments, a little over a half could be private sector, around \$350 bn from MDBs and \$100-150bn, from highly concessional flows. This type of make-up of flows would be necessary to share risk with the private sector in some areas, and, in others, to provide publicly sourced finance for aspects of a just transition, adaptation, or natural capital.

Hence we have the “triple agenda” report which we took to the G20 summit and to G20 Finance Ministers this year. The report, by an expert group chaired by NK Singh and Larry Summers, (I was a member), was prepared at the request of the Indian G20 Presidency. The “tripling” embodies: (i) adding sustainability to the MDB agenda; (ii) tripling MDB financing flows; (iii) creating new investment vehicles, including from new sources. Thus we move from economic analysis to practical, if challenging, proposals. The report was welcomed last month both by G20 Finance Ministers, who look to the next presidency (Brazil), for implementation, and also welcomed by the heads of the MDBs, in their meetings in Marrakech. This gives a crucial and rare opportunity for the MDBs to raise their game and help drive forward implementation of Paris and the new growth story.

For this to happen the MDBs must change their culture and ways of working, to collaborate much more closely and effectively with the private sector. Firms around the world have seen the opportunities in the new technologies and efficiencies of the 21st century and are moving away from

the destructive and wasteful approaches of the 19th and 20th. The private sector has been crucial in driving clean technology forward at a remarkable pace. The private sector is at the core of both investment and innovation.

The rich world, as I have argued, must cut emissions strongly and work to foster much bigger financial flows to EMDEs in both the private sector and the MDBs. It should provide increased overseas development assistance and grant resources too, particularly for poorer countries and for sectors and activities which find it difficult to attract private sector capital.

The most important countries outside the rich world in terms of size and influence are China and India. I have been working on and in China for 35 years and on and in India for 50 years. Both are recognising the immense risks of climate change and the tremendous opportunities in the new growth story. China's 15th 5-year plan (2026-2030) will be the most important climate policy event in the coming decades. India showed real leadership on sustainability in their G20. However, emissions continue to rise in both giant countries. China is likely to peak before 2030 and India before 2040. But it is a rapid route down to net-zero that the world needs. Constructive collaboration with these two countries around climate should be of the highest priority for international and economic relations for both Europe and the USA.

So what are our prospects and how must we work? I am often asked how my perspectives have changed since the Stern Review was published in 2006. In summary my answer would be, first, the science is still more worrying. Second, technology has moved far more quickly than we imagined. Third, the politics have moved across space and time, not always forward, but they now embody climate at centre stage. Fourth, we now see a new growth story much more clearly than then. Fifth, there is increasing realisation of just how big change must be, but not always willingness to take on the difficulties of that change.

Overall, I am very optimistic about what we can do. We really can see a path to a world with much stronger mitigation and adaptation and to a new much more attractive model of growth and development; sustainable, resilient, and inclusive.

However, I am deeply worried about what we will do. The scale and pace of structural, technological and social change must be large and rapid. That will require changes in behaviour and institutions. It will require purposive and sustained political leadership, and strong political pressure from society as

a whole on decision-makers to deliver change. It will require a willingness of individuals, communities and enterprises to change their behaviours. Reasons to hope include that young people recognise both the necessity and the opportunity. And they are increasingly knowledgeable about what we have to do. Much, although not all, of the private sector recognises the risks of business as usual and is committed to the new opportunities and directions.

But we must be clear that all too many politicians are unwilling to take strong action for sustainability and see short-term political returns in resisting change, playing to vested interests, and fostering climate scepticism. Many fossil-fuel companies are vigorous in their fight back, including using misguided security arguments to suggest we prolong fossil fuel use. That is profoundly wrong; insecurity has come from depending on fossil fuels, often from unstable or less-than-benevolent sources.

The task of those of us working and researching in this area is to show what can be done, why it is feasible, why it is attractive and why it is essential if we are to avoid catastrophe for our children and grandchildren.

We must pay close attention to the politics as well as the practicalities. There is nothing more important for our futures. Good politics and sound practice rest on clear strategy, effective delivery mechanisms, and an understanding of the economics of fundamental change. Powerful communication and inspirational leadership will be critical. All this is why strong and well-focused analyses are crucial. And there is nothing more fascinating intellectually. We must turn what we can do, into what we will do.

Thank you again for this great honour.