



## OFFICE OF THE PRIME MINISTER'S CHIEF SCIENCE ADVISOR

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### Opening address

#### Third Meeting of APEC Chief Science Advisors and Equivalentents (CSAE)

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APEC provides a pre-eminent forum for member economies to discuss, debate and reach consensus on the most pressing issues that affect all of our economies. Certainly these have been about our respective economic health, but increasingly we see the links between economic advancement and better education, better livelihoods, more awareness of our environmental impacts and, importantly, the ability to do something about it.

While the relationship between technology, innovation and economic growth (as circuitous as it is) is well understood by most member economies, science has a much broader role to play. Increasingly science is at the heart of the many grand challenges we face: climate change; water, food and energy security; urbanization; and aging of the population, for instance. Science is increasingly informing every part of a government's policy-making machinery. Whether this is done through Chief Science Advisors, through academies, or most often through both, governments increasingly need science advice both to inform and progress responsible public policy across all domains, and – perhaps especially - to respond appropriately in times of crises. It is in this context that we are meeting in KL over the next two days.

The story of this meeting started with a side meeting hosted by the President of AAAS in Washington in 2010. At that time, issues of mutual interest were discussed amongst senior scientists and science advisors of the member APEC economies. This led the Russian Federation and New Zealand to propose the establishment of this group that was approved at the APEC leaders' summit in Vladivostok in 2012. This group has always been viewed as an informal gathering to focus on that nexus between science and public policy, broadly defined. We have met twice before: in Indonesia in 2013 and in Auckland, co-hosted by China, in 2014. We meet here now with Malaysia graciously co-hosting at the request of the 2015 APEC host economy, The Philippines.

The initial meetings were primarily about networking and understanding one another's role in their home contexts. We also sought to understand how we might cooperate and collaborate as a peer group. At the Auckland meeting a year ago, it became clear that we had reached a point to really drill down and focus on areas where we could assist our mutual interests. Hence the programme for this year's gathering is designed around two concrete themes – science advice in emergencies

and the intersection of scientific and traditional epistemologies which is of particular interest within societies within the APEC region.

Globally there is rising interest in how science advice to governments can be made more effective. There are very different models depending on history and context. There is now an international network on governmental science advice, which I chair and the OECD has recently released a paper on the need for countries to have effective advisory systems.

Science advisors and advisory groups, which are often comprised of national academies, work with governments in three distinct ways: providing formal or deliberative advice; providing informal advice; and providing advice in emergencies and crises. Here, I am distinguishing the use of science to inform policy from the more normative ways that scientists can assist policy-makers shape the science and innovation system itself. The latter is often seen as the primary purpose of science advice, but this is a very narrow framing.

To expand on the typology of science advice, deliberative advice is often applied to complex technical issues, for which there is sufficient time to develop robust questions, collect data and provide analyses - academies, panels of science advisors and experts can be well placed to deliver such advice provided the question is proffered appropriately in the first place.

But political and policy leaders also need advice on a constant and informal basis across the whole of the policy cycle and, indeed, often at that early stage when policy ideas are being generated either within specific departments or within the executive offices of government. Here, the input is necessarily less technical and more strategic. It generally requires almost instant responses from someone able to quickly and ably bridge the two cultures of policy and science. This type of advising requires a high level of trust between the players – and the advisor must maintain the highest level of professional and scientific integrity. Increasingly it is this more informal model that has a critical role in enhancing evidence informed policy formation and promoting better use of science by governments. This is because the informal approach can work so seamlessly with more deliberative mechanisms – by safely raising issues, by kick-starting conversations and requests for deeper analysis and framing the questions for deliberative analysis, and by brokering knowledge that is timely and relevant to decision makers. But doing this depends on a trustworthy individual in a boundary role and globally these roles have been established in only a few countries. But depending on the mode of governance, such roles are becoming more important to science informed policy-making and using science in the national interest - for example in diplomacy

But when crises and emergencies occur there is yet another role for science advice. Here the advisor effectively becomes part of the decision making process. Increasingly (and perhaps particularly after a number of well-known disasters) there now seems to be more attention paid to the needs of countries for science advice in emergencies and in promoting greater resilience and addressing risk.

In setting the agenda for this meeting, in conjunction with our host Professor Zakri Abdul Hamid, CSA to the Prime Minister of Malaysia, and our Philippine counterparts, we were conscious that the role of CSA&Es is to assist governments to use science better to serve their national interests. This is distinct from the activities related to the applied operation of innovation systems that are of interest to other parts of the APEC structure such as the PPSTI. For their part, the CSA&Es focus in part on the science-policy nexus and in part on the science-society nexus. Our meeting agenda reflects both of these dimensions.

So the major topic of this meeting week is how we can build off the recommendations of the UNISDR meeting held in Sendai earlier this year so that the unmet need for science advice in emergencies, in promoting resilience and in addressing risk can be better delivered. What are the opportunities for sharing experience and ideas, and for collaborating in issues ranging from facing natural and biological risks to other regional challenges from which a crisis can emerge: illegal migration, or large scale artisanal mining and deforestation might be some of these.

Science can shed light on these issues in many ways, and we shall be discussing some of those both from the perspective of recent experience and from a more conceptual perspective. For example what is the role of national risk registries and how does one think about preparing for acute crises such as a typhoon versus chronically emerging issues such as climate change in the context of such registries? A further complex issue which this uncovers, and which we started discussing in Auckland last year, is how to provide effective science advice in the international arena. Here this is an inherent tension between the goal of maintaining relatively values-free science, which should be able to transcend geo-political borders, and advising on areas of jurisdictional interest, which will always have a values component. This is perhaps the biggest issue in the development of science advisory systems.

This discussion segues into the complex issues of perceptions of risk, and caution. At a recent OECD advisory board meeting that I attended there was a general concern that the public response to the pace of scientific discovery and technological innovation made the issue of social license all the more acute. And yet, these broader science-informed societal debates are too often overlooked. . Whether it is the classic case of GMOs or whether it is many technologies now on the visible horizon such as driverless cars or the many applications of artificial intelligence, decisions about whether technologies should be accepted or rejected are fundamentally public decisions, and not for scientists alone.

We have important roles to play in ensuring that there is early and appropriate engagement of the multiple and diverse communities across all of our economies in discussions of science and technology applications. Indeed, we are all learning the importance of science literacy and the particular shape of public reason in our societies. But whereas science is an epistemology that strives to the extent possible to limit values from the core elements of research design, data collection and analysis, many other epistemologies inherently put values in a very different place. Hence religion, tradition and belief are very important components of societal consensus building. Science and these other epistemologies often can have an uneasy relationship. Indeed there remains considerable skepticism in much of the

broader community about science – just as scientists can be sceptical and dismissive of other culturally-inscribed ways of knowing. But we have learnt that hubris, scientific dogmatism and simply forcing more science do not necessarily change long-held world-views. If we are to be effective we need to think more about how science embeds itself alongside other epistemologies.

Nowhere is this more obvious than in some of our member economies where traditional knowledge, enriched as it is by custom and intergenerational empirical observation, can enhance or collide with the contemporary paradigm of science. Arguably, the epistemological gaps between science and any other non-science based epistemology share common features, yet first peoples and traditional knowledge holders constitute a particular case that cannot be ignored.

Adopting a deficit approach that says traditional knowledge holders should just understand science better is simply wrong. Rather it is a matter of understanding the inherent differences and similarities between values-rich knowledge and the scientific approach. We will discuss this challenge in some depth and explore how science and traditional knowledge can co-exist to mutually benefit our societies.

The concluding discussion of the meeting will look to the future of this group. How can it best add value? Should we invite the presidents of national academies to join us given their complementary roles in the science advising landscape? How should we interact with other components of the APEC structure, such as PPSTI? What distinguishes our role and what else should we explore to benefit the APEC agenda? Can we in the Asia Pacific region explore new ways of working together to promote evidence-informed decision making in the international arena?

Once again I thank the Governments of Malaysia and The Philippines for enabling us to meet, and look forward to two days of fruitful discussions.