NIST
National Institute of Standards and Technology
U.S. Department of Commerce

APEC
Asia-Pacific Economic Cooperation

中国计量科学研究院
National Institute of Metrology, China

APEC Regional Workshop on Measurement Challenges in Renewable Energy and Climate Science

29 October, 2015

Changping Campus, National Institute of Metrology, China

OBJECTIVES

- **Identify technology and metrology areas where training and sharing of best practices will be most beneficial for APEC economies**
- **Explore ways to promote regional and international partnerships to share approaches and best practices for expanded utilisation of RE, measurement of air quality, GHGs and other pollutants, and efficient energy use and distribution systems**
- **Develop an action plan for APEC with priorities for possible workshops/activities to improve regional measurement and standards infrastructure for RE and CS**
- **To assist developing economies achieve international equivalence and recognition of these capabilities to support RE industries and carbon emissions trade**

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Panel discussion:

Panel to discuss each topic using all of their "hats" – global, regional and national. 2-3 mins Q&A after each question.

1. **What are the highest priority measurement challenges in RE and CS for your economy? What capabilities exist to address these? What is needed in metrology infrastructure and training? How is your NMI filling the gaps? (2-3 mins/panellist)**
2. **What policy or regulatory drivers are there? What are the gaps in the broader technical infrastructure in terms of regulation, standardisation and accreditation? (10 mins for panel)**
3. **What strategies and opportunities for collaboration can we, in the Asia Pacific, learn from, adapt or partner with? How are you partnering with the private sector?(10 mins for panel)**
4. **What lessons can you share with developing economies, e.g, in engaging with stakeholders and understanding their needs? (10 mins for panel)**
5. **How can we in the Asia Pacific fill the gaps with, e.g. training (incl. awareness-raising, education of metrologists and policy-makers), access to resources (expertise, funding), etc? (10 mins for panel)**

25 mins plenary discussion: Next steps, and priorities for APEC for activities/workshops in the future

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Panel discussion:

1. What are the highest priority measurement challenges in RE and CS for your economy? What capabilities exist to address these? What is needed in metrology infrastructure and training? How is your NMI filling the gaps? (2-3 mins/panelist)

- China: Two priorities for measurements in climate science 1) Identify better methodologies and procedures; 2) Build SI linkages to measurements
- Japan: Global Warming is an issue and Japan needs to understand deep sea temperature fluctuations. Japan has two satellites for GHA monitoring and it needs to improve the accuracy of measurements. How to work with the metrology community to bring trust in the use of Nuclear power and meet the requirements for stronger safety.

Panel discussion:

Cont. Question 1

- **US: 1)Issue is to make better atmospheric velocity measurements just below the boundary level for the purpose of validating different meteorological models. The performance of these methods are not at the level needed for test bed centers. 2) Gap between the meteorological and metrology community.**

- **UK: 1) The biggest issue is how the metrology community help the climate community. 2) UK is concentrating on solving problems essential for climate models with highest uncertainty to provide biggest impact. 3) Organized workshop to teach policy makers and industry to understand measurements models and uncertainty.4) Issue of Quality Assurance – the UK is working with the EU to put together an accreditation process for the Climate Community 5) Created a multiple layer tool for graphical representation of measurement uncertainties.**

- **Chinese Tapei: 1)GHG measurement in chemisty: Need to develop standards for gas concentrations and specifically reference materials to provide to the industry. 2)Airborne particulates measurement: need to harmonize the results of reference methodologies. 3) Improve air speed measurement methodologies for meteorology and environmental protection applications.**

Panel discussion:

Cont. Question 1

●Korea: Government in Korea wants to control carbon emission from the factories and KRIS is assisting with the reporting. 2)Korea setting of regulation for reduction of carbon emission is mandatory. 3) Reporting uncertainties are the biggest issue, and KRIS provides education to industry. 4) A big problem in APEC is language communication. And big difference among NMIs.

2. What policy or regulatory drivers are there? What are the gaps in the broader technical infrastructure in terms of regulation, standardisation and accreditation?

- **A technical gap is understanding data from small sensors to well-calibrated sensors. Better methodologies to evaluate the performance of cheaper sensors, will be a challenge for each country. Improve inconsistency in measurement methodologies**
- **Engaging both meteorological and metrology communities Ex. NIST and NOAA collaboration**

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Panel discussion:

3. What strategies and opportunities for collaboration can we, in the Asia Pacific, learn from, adapt or partner with? How are you partnering with the private sector?

- **NIM and NIST had frequent joint meetings and personnel exchanges that helped to improve the low carbon lab in NIM. NIM also has guest researchers exchanges with NPL. Sharing technical personnel can improve inconsistency and uncertainties.**
- **KRISS assisted Indonesia to establish gas laboratory. They trained two gas metrologists for two years.**
- **Examples: NIST works with a private company for GHG measurements, but most climate activities are dominated by government agencies.**
- **Try to do research that is complementary not duplicative.**

Panel discussion:

4. What lessons can you share with developing economies, e.g, in engaging with stakeholders and understanding their needs?
5. How can we in the Asia Pacific fill the gaps with, e.g. training (incl. awareness-raising, education of metrologists and policy-makers), access to resources (expertise, funding), etc?

- Thailand: Big gap in regulating industry 2)Lack of funding and need of technology transfer.
- Chinese Tapei: Care more about modeling than uncertainty and the need to understand their needs to assist government to set regulation feasible and implementable.
- Need to educate policy makers/politicians on Climate Change related technology requirements.