

## **IGF 2017 Reporting Template**

- **Session Title:** “Two Networks Will Shape Your Digital Future”

- **Date:** December 20<sup>th</sup> 2017

- **Time:** 16:40-18:10

- **Session Organizer:** Garland T. McCoy, President, Technology Education Institute

- **Chair/Moderator:** Marilyn Cade, President, ICT Strategies

- **Rapporteur/Notetaker:** Lee McKnight, Associate Professor, School of Information Studies, Syracuse University and Garland McCoy, President, Technology Education Institute

### **List of Speakers and their institutional affiliations:**

Kristopher Haag, Director, New Business Development & Emerging Technologies, EMI Advisors, Private Sector, USA

Manu Bhardwaj, Vice President for Research and Insight, MasterCard Center for Inclusive Growth, Private Sector, USA

Vint Cerf, Vice President and Chief Internet Evangelist, Global Policy Development, Google, Private Sector, USA

Nilmini Rubin, Vice President, International Development, Tetra Tech, Private Sector, USA

Bill Ash, Strategic Program Manager for the IEEE Standards Association, Technical Community, USA

Wisdom Donkor, National Information Technology Agency Ghana, Government, Ghana

Omar Mansoor Ansari, President, TechNation, Technical Community, Afghanistan

### **- Key Issues raised (1 sentence per issue):**

Interdependency of Access and Electricity (and finance/payments)

People in rural areas that do not have electricity are being held back in achieving their potential as much of their time is spent gathering fuel for cooking or they have to get expensive and unhealthy kerosene and if they are consumed with managing their needs in these areas they have little use for Internet access and no way to charge Internet connected devices.

Panelists recognize need for simultaneous consideration of multiple -critical infrastructures- for more rapid deployment of advanced infrastructure for energy, Internet, and finance among other sectors as Vint observes.

Nilmini- “Without electricity the Internet is a black hole!”

Kris and Manu stressed the importance of ensuring a payment network to support electricity generation and storage... microgrid networks and referenced the payment model in use by cellphone companies, i.e. prepaid.

All speakers stressed the need for establishing standards and protocols in the connected electricity space (for interconnection of networks) similar to those established for the Internet space.

Panelists all seemed to agree there is a need for efficient, modular, interoperable/interconnected energy generation and storage models, which will require microgrid architecture experimentation. Interconnection with the Internet - and the Intercloud – is essential to create reliable, resilient, platforms that will reduce costs and to allow for a payment system to emerge that will ensure success.

The platform architecture would need to include IEEE 2030.10 as well as market and regulatory standards and policies the panelists observed

Vint-observed that there was no need to follow the old model of centralized baseload power plants with transmission and distribution network (grid) - modular standardized and networked alternative energy-powered community microgrids is a better if still evolving model.

Speakers all agreed that THREE networks might be appropriate theme for the next IGF workshop proposal (Internet Access, Electricity/Power, Finance)

**If there were presentations during the session, please provide a 1-paragraph summary for each presentation:**

Marilyn set the stage by noting the collective effort that was involved in getting this workshop approved. She referenced the fact that without reliable, affordable electricity providing an environment for sustained Internet engagement was just not possible. She spoke of the inter-dependency of access and electricity and how important the two are in addressing the UN's SDGs. She talked about conditions in rural areas of developing countries where, for example kerosene is used to provide light and fuel for cooking, etc. which she noted is expensive, and hazardous to health. Marilyn spoke of the work being done by IEEE with their "smart villages" that are experimenting with power saving devices and most recently power generation and storage. The key to "smart villages" is the concept of standardization of components (modular design) with generation, storage and communication (Internet access) the goal. IEEE standard 1547 for interconnection was referenced as critical. She also spoke of the fact that the Internet and communications systems relied on standards and protocols to operate as did the financial or payment networks so in the new world of micro-electricity generation, storage and supporting payment networks you will need standards and protocols for interconnect.

Manu began his presentation noting that the genesis for this intervention was the observation that he might be the first participant from a financial service company in the IGF although this was the seventh time he had attended and participated in an IGF conference with his previous trips being as an official of the US Department of State. He said there is a story to tell here because finance companies have had an integral role to play in development at large. He said the story is one of JP Morgan who was a venture capitalist and he had an important relationship with Thomas Edison. It turned out that Edison had been turned away by many investors until JP Morgan saw the potential of his technology, invested in it until Edison lit up his home in New York with the technology and New York became the first city that benefitted from Edison's invention. Manu said it just shows you that there is the inventor and investors and investors need to be part of the conversation. He went on to say that many of the panelists and others talked about the need for financing entrepreneurs and this is so because to connect the next 1.5 billion would require \$450 billion according to the ITU. He said he didn't think that number was an accurate depiction of what technology can produce and how this evolves, but it shows you that there is a significant amount of investment that has to come from private companies and finance ministers and the finance community. And it is incumbent upon us to more strategically engage one another. He observed that there is a lot of high-end capital out there that is excited about investing in these types of experiments because they understand a philanthropic but also the profitability if it goes to scale.

Nilmini began with a concrete statement “The Internet won’t work without electricity”. She went on to say that the same things that are holding women back in developing countries when it comes to internet Access and adoption are holding them back in access to electricity. She spoke of children unable to study as they spend all their time gathering fuel and water. No electricity for heating, cooking or studying and no electricity to pump water from a well or river or stream and purify the water. She said that a good model to look at for a distributed then networked platform for the generation and delivery of electricity/power in developing countries would be the cell phone model with its very distributed yet networked platform. You need protocols and standards she said to make the new electricity network of networks interconnection or aggregated linking all the community microgrids together. She pointed out that by networking the microgrids you achieve a high level of reliability, resilience and you lower the costs. She discussed the importance of bringing stakeholders together with an agenda of solving problems rather than just endlessly discussing issues. On a final note she mentioned President Trump’s recent support for universal access to electricity and reforming international financing institutions as steps in the right direction.

Bill used IEEE’s “Smart Village Initiative” as an example of IEEE’s on going work in developing countries where they are focused on both Internet Access and electricity management in the deployment and use of more energy efficient devices and in generation and storage. Bill pointed out the need for local workforce training to ensure long-term success. Bill mentioned the important work IEEE does in the development of standards in this space, specifically referencing IEEE DC microgrid standards work. Finally, he took the opportunity to reinforce the important role establishing payment systems are to ensuring platform sustainable.

Omar spoke of the situation on the ground in Afghanistan and how fighting wars over the past several decades has taken a huge toll on infrastructure. He also discussed the importance of developing locally relevant content to help drive access and to ensure long-term adoption. He gave examples of the challenges faced by start-ups put pointed to new public sector private sector initiatives designed to attract and help support new entrants and new initiatives. He also sighted examples of projects that are being funded to re-think and rebuild the legacy infrastructure using 21<sup>st</sup> century technology focusing on access, energy and financial networks. He commented on the unique challenges of building infrastructure in a country recovering from war, but with great potential to advance education and healthcare, when power and Internet and locally relevant content are brought together. Literacy and digital literacy are challenges, especially for women, but there are a number of initiatives focused on those challenges.

Wisdom spoke of how challenging the conditions are in Africa when it comes to affordable, reliable electricity. He went on to discuss how the conditions outside urban areas have both Internet access and electricity availability issues and how this is where the need is greatest for both of these empowering tools. He used examples of people using car batteries to charge mobile phones and how often fiber optic cable is deployed into a region that has no electricity service! He thought the deployment of modular units that could generate and store electricity would be able to help incentivise bringing with it Internet access by providing the reliable power 24/7/365 the local wireless service provider would need for a cell tower that could be located there. He went on to say you have electricity for the local community as well as handling the power for their cell tower. He also mentioned that when you networked the microgrid electricity generation and storage units together in an area you would be able to provide more reliability of service and lower the cost for everyone. He mentioned that Ghana had good policies in place to support such experimentation and investments but that the execution of these types of efforts has been slow in coming. In summing up he mentioned the work in Nigeria where cell spectrum mapping is taking place thanks to mobile power generation and storage units that can be taken into remote areas providing the needed power for remote changing of the equipment allowing the mapping teams to extend their time in the field. .

Vint began his talk by noting that we should be talking about THREE networks, as we will need electricity/power, Internet access and a payment/financial platform/network to ensure sustainability of the other two services. He highlighted the fact that the three networks/service platforms provided a very solid and sustainable synergistic set of very positive tools/services of great value no matter where you live and of course of critical use in rural areas around the world. He noted how the Internet differed from the old telephone network in that it has storage built into the network while the old telephone network had to

manage one connection at a time. This allows the Internet to work through any constraints on the network by storing and rerouting traffic in real-time. Vint noted how the cost of storing electricity was a critical issue but he noted how the cost was falling similar to how the price of data storage was very high at first and has fallen precipitously over the decades to where it is now very inexpensive. He spoke about new technologies for electricity storage that were coming into the market place that held great promise and used Redox Flow Battery technology as an example of a low cost solution.

Kris began his presentation talking about the “silo effect” that insulates these two networks; communication and energy/electricity with regards to their regulations and the ministries that have oversight. He discussed how challenging it is to work across regulatory authorities, which has increasingly become necessary as both of these 130-year-old networks are merging. You need to fix the regulatory silos and the best way to do that Kris said was to find a champion that will work inside to make things happen. You need to have the leaders of these two important government agencies see things through the eyes of the other minister so for example you might be able to have multiple use of conduits, both power and access cables. He went on to discuss how bringing ministers from different agencies together and having them all focus on problems that require cross agency coordination like providing access, or electricity, or clean water can prove invaluable to achieving desired results. He noted that there was plenty of examples of “best practices” around the world that can help regulators fashion policies in the access and electricity areas that encourage growth and provide ample revenue for the government. He spoke of his experience in applying the “best practices” used during disasters to inform the framework for normal, non-emergency operations. He also sighted the fact that in Afghanistan for example there were no e-payment programs in place and that this was a drawback in sustaining the financial stability of many private sector and public sector initiative.

**Please describe the Discussions that took place during the workshop session (3 paragraphs):**

Marilyn, Bill Ash, Kris and others engaged in a detailed conversation on the important role standards and protocols play to ensure every component in the production of a modular electricity generation and storage can be build cheaply and be networks with their counterparts in other modular units. The focus was on IEEE’s 1547 standard for interconnecting microgrids. Standardization of component parts is tremendously helpful in training a workforce to operate and maintain the equipment. Also noted in the discussion was the fact that you were working with DC power and standards written specifically for DC power, as stored power is DC power and for solar energy generation, which is DC power generation. So the new way forward will be to generate and store DC power and when necessary convert it to AC.

Marilyn and Omar discussed the need for more public /private partnerships designed to tackle regulatory issues with a mandate to find solutions not to talk the issues to death.

Vint lead a series of discussions that focused on the differences between how the old telephone switched network operated and the way the Internet operates and how technology advancements coupled with standards and protocols have given us the Internet we know today and how they are also driving the Internet of tomorrow with IoT and “smart” devices leading the way. He also lead a discussion on new technologies in the area of power storage.

**- Please describe any Participant suggestions regarding the way forward/ potential next steps /key takeaways (3 paragraphs):**

Vint called for the consideration of the theme for the next IGF workshop to be “**Three** Networks Will Shape Your Digital Future” as there was consensus that including financial/payment networks along with Access and Electricity would generate a very empowering and powerful synergistic set of tools.

Remote Participant: Lee McKnight: Syracuse University, who is facilitating establishment of Inter-Agency Task Forces and Advisory Groups which include private sector actors, to date in cooperation with Liberian President Ellen Johnson Sirleaf & 5 ministries in anticipation of 1st Liberian Internet Forum - see [liatag.org](http://liatag.org).

Lee described how Liberian President Sirleaf’s rural farm home and neighboring village was connected with an Imcon Internet Backpack last weekend in rural Liberia as one example of how cooperating with the top also incentivizes all ministries to cooperate to make progress. Hence the need for Inter-Agency Task Forces and Advisory Groups, as US used decades ago to get Internet going faster in US in 1990s. Lee noted similar process thus far with several ministries and 5 Provincial governors in Democratic Republic of Congo: [iatag.org](http://iatag.org); before 1st DRC IF. Lee invited participants to join in with Internet Society and these initiatives in facilitating/participating in these modular policy processes, for other countries as well.

## **Gender Reporting**

**- Estimate the overall number of the participants present at the session:** In the room and online: 50+

**- Estimate the overall number of women present at the session:** In the room: 8 out of approximately 20 participants.

**- To what extent did the session discuss gender equality and/or women’s empowerment?**

Marilyn, Nilmini, Kris and Manu and Omar were keen to focus on the fact that women were often the primary users of the Internet Access and Electricity (and financial services/network) while the decisions regarding the devices and services are still largely in the hands of men, which continues to present challenges. In some cases, girls are not expected to attend school through to completion or are not expected, once they complete education, are not expected to be able to work outside the home. Girls are not expected to be able to participate in after school activities, while boys are given this opportunity. Initiatives are needed to better support the family/cultural support of the benefit of access. .

**- If the session addressed issues related to gender equality and/or women’s empowerment, please provide a brief summary of the discussion:**

Kris discussed the commitment of the Bayat Group and Bayat Foundation to women empowerment noting the remote women healthcare focused e-health work done in partnership with Afghanistan Wireless, telemedicine and the network of hospitals the Bayat Group has supported through their charity work, much of the focus on women’s health and education.

Marilyn referenced women training programs in Afghanistan, conducted by TechNation; Omar’s comments addressed the importance of improving useful access to women, and encouraging opportunities for girls and women in access, but also noting the importance of content in local languages. .

## **IGF Workshop #200**

### **Two Networks Will Shape Your Digital Future**

**Day 3, Wednesday December 20<sup>th</sup>**

**Workshop Room XII 16:40-18:10**

#### **Setting the Stage:**

According to the World Atlas 67% of the developing world is still without household electricity in 2017. This translates into roughly 1.3 billion citizens in the world today lack access to reliable power/electricity to serve their daily needs, power healthcare facilities, education, and home/personal uses. The Internet is viewed as a “right”, and the world recognizes the importance of creating affordable access to the Internet and the online world, yet the role of power/electricity is often ignored. To date, at the IGF, there has been significant focus on addressing the digital divide. Yet, the role of power/electricity is just now being put on the front burner at the IGF2017.

This is a critical opportunity, and this workshop will bring together experts who can speak to how they are addressing solving the power challenges in different situations – some in rural areas, and some in smart villages and smart cities.

Advancements in technology have provided the opportunity to generate and store power/electricity in small mobile units suitable for deployment in rural areas in developing countries at affordable price. These units can, for example, serve the increasing power needs of communications towers and do so with clean renewable power as well as serve the needs of the local communities setting up business opportunities with established anchor tenants. Additionally, technology advancements hold the promise of delivering much needed baseload generation to stand up industrial development, education, healthcare, major infrastructure projects, information/content processing, storage (caching), transit, etc. Delivering electricity and access will help advance work on the UN’s SDGs (see link to UN SDGs site ... <https://sustainabledevelopment.un.org/sdgs>)

## **AGENDA**

Format: 90-minute Roundtable

### **Setting the Stage:**

**Moderator:** Marilyn Cade, President, ICT Strategies, Private Sector, USA

### **Key Speakers:**

Kristopher Haag, Director, New Business Development & Emerging Technologies, EMI Advisors, Private Sector, USA

Manu Bhardwaj, Vice President for Research and Insight, MasterCard Center for Inclusive Growth, Private Sector, USA

Vint Cerf, Vice President and Chief Internet Evangelist, Global Policy Development, Google, Private Sector, USA

Nilmini Rubin, Vice President, International Development, Tetra Tech, Private Sector, USA

Bill Ash, Strategic Program Manager for the IEEE Standards Association, Technical Community, USA

Wisdom Donkor, National Information Technology Agency Ghana, Government, Ghana

Omar Mansoor Ansari, President, TechNation, Technical Community, Afghanistan

Following the speakers 20 minutes will be devoted to moderated interactive participation with the speakers and the audience (live and remote)

The final 10 minutes of the program will be devoted to key points and messages of the roundtable talks and discussions captured by the moderator and rapporteur and delivered as a summation of the workshop.

**Rapporteurs:**

Lee McKnight, Associate Professor, School of Information Studies, Syracuse University, Technical Community, USA (remote)

Garland McCoy, President, Technology Education Institute, Private Sector, USA