Marina Bay Sands Expo and Convention Center
Singapore
2-3 July 2012

Minutes

Summary

The Global Methane Initiative (GMI) held a tri-sector subcommittee meeting (Municipal Solid Waste, Municipal Wastewater Treatment, and Agriculture) on 2-3 July 2012 at the Marina Bay Sands Expo and Convention Center in Singapore. The Municipal Solid Waste Subcommittee meeting convened on 2 July 2012; the Municipal Wastewater Subcommittee meeting began in the afternoon of 2 July 2012, and concluded in the morning of 3 July 2012; the Agriculture Subcommittee meeting convened in the afternoon of 3 July 2012. Prior to the start of the subcommittee meetings on each day, there were plenary and cross-sector sessions.

The tri-sector subcommittee meeting agenda is posted on the GMI website, and is included as Annex 1.

The tri-sector subcommittee meeting was attended by 45 representatives from 23 countries: Argentina, Brazil, Colombia, Dominican Republic, Ethiopia, Finland, Germany, Ghana, Greece, Hong Kong S.A.R., India, Indonesia, Japan, Mexico, People's Republic of China, Philippines, Poland, Serbia, Singapore, Sri Lanka, Thailand, Turkey, and the United States. A list of participants is includes as Annex 2 to these minutes.

Presiding over the meeting were:

- **Administrative Support Group (ASG)**: Henry Ferland (United States, Environmental Protection Agency), Co-Director
- **Municipal Solid Waste Subcommittee**: Tom Frankiewicz (United States, Environmental Protection Agency) and Sandra Lopez (Colombia, Colombia Ministry of the Environment and Sustainable Development), Co-Chairs
- **Municipal Wastewater Subcommittee**: Elias Freig (Mexico, National Water Commission), Chris Godlove (United States, Environmental Protection Agency), and Federico Grullon (Dominican Republic, National Council for Climate Change and Clean Development Mechanism), Co-Chairs[1]
- **Agriculture Subcommittee**: Allison Costa (United States, Environmental Protection Agency), Anil Dhussa (India, India Ministry of New and Renewable Energy), Jorge Hilbert (Argentina, INTA), Co-Chairs

[1] Elias Freig and Federico Grullon were appointed co-chairs during the Municipal Wastewater Subcommittee meeting.

Plenary and Cross-Sector Sessions

Plenary and cross-sector sessions took place in the mornings of 2 July 2012 and 3 July 2012.

On the morning of 2 July 2012, Mr. Ferland (Co-Director of the GMI ASG) began the tri-sector meeting by welcoming all attendees. He introduced himself and his role as Co-Director of the GMI ASG. Mr. Ferland thanked the Singapore hosts for their hospitality, and then invited all attendees to introduce themselves.

After attendee introductions, Mr. Ferland provided an update from the ASG. Topics included:

- Steering Committee charge to subcommittees
- Launch of new Short-Lived Climate Pollutants (SLCPs) Initiative
- Revised Action Plan Guidance
- Methane Expo 2013
- Future subcommittee activities

On the morning of 3 July 2013, Mr. Ferland provided an update on the newly formed Climate and Clean Air Coalition (CCAC) to reduce short-lived climate pollutants (SLCPs). Mr. Ferland explained there is potential overlap with GMI activities, and that GMI has quite a bit of relevance as CCAP moves forward since methane represents the majority of the greenhouse gas forcing under focus by CCAC. He stated the ASG is keeping track of CCAC's progress and how activities might affect GMI. Topics addressed by Mr. Ferland included the following:

- Coalition history
    - Launched on February 16, 2012
    - First ministerial hosted by Sweden on 23-24 April 2012
    - Coalition hosted by United Nations Environmental Programme (UNEP)
- CCAC addresses methane, black carbon, and hydrofluorocarbons (HFCs)
- CCAC is supported at ministerial level, whereas GMI is more at operational/project level.
- CCAC focal areas:
    - Black carbon from diesel vehicles
    - Black carbon from brick production
    - SLCPs from municipal solid waste and landfills
    - HFC alternative technology and standards
    - Methane emissions from oil and natural gas production
- Cross-cutting initiatives
    - Finance (UNEP working with World Bank)
    - Outreach and awareness raising (led by Sweden, United States, and UNEP)
    - National action plans (UNEP and Mexico working on next steps)
- CCAC Outreach Competition (open for young people age 12-25):
    - Best tagline or slogan for CCAC
    - Best description: "What is a SLCP"
    - Best social media proposal for messaging on SLCP and coalition's work
    - Best audio visual product which communicates SLCP impacts and opportunities to address them
- Next steps:
    - Implement focal area initiatives and key activities
    - Recruit and engage new partners, including private sector
    - Raise awareness and conduct outreach

After Mr. Ferland concluded his presentation, he asked attendees if there were any comments or questions.

Marlene Sieck (Germany, Federal Enviroment Agency), asked whether there is an actual person currently in charge of CCAC's solid waste activities. Mr. Ferland responded that UNEP is still looking to fill the position.

Brian Guzzone (United States, Eastern Research Group), asked about the role of the GMI Municipal Solid Waste Subcommittee in relation to the CCAC. Mr. Ferland deferred to Tom Frankiewicz (United States, Co-Chair Municipal Solid Waste Subcommittee). Mr. Frankiewicz stated there is a lot of overlap/commonalities between the two programs. Right now, CCAP is looking to define its MSW activities. CCAP is trying to identify cities to work with and to offer various types of assistance that can be replicated across more cities (e.g., technology demos, capacity building, city action plans). The expectation is the Municipal Solid Waste Subcommittee work will be a resource for CCAC, and that the measurement, reporting, and verification (MRV) component of Nationally Appropriate Mitigation Actions (NAMAs) will be a large component of crossover.

Elias Freig (Mexico, National Water Commission) stated CCAC does not have the assets of GMI and it might make sense for GMI to serve as technical secretariat or advisors for CCAC. GMI is composed of mid-level public servants and doesn't have clout of CCAC, which is at ministerial level. GMI needs to make an alliance with CCAC to help out and serve in a technical advisory role. Mr. Ferland expressed agreement with Mr. Freig's statement.

Daniel Fikreyesus (Ethiopia, Community Development Research) brought up a World Bank example of how Ethiopia helped out at local level to fulfill a World Bank mission on a particular initiative.

Mr. Ferland also mentioned that CCAC has been able to get countries to make financial pledges, and is forming a funding mechanism to support projects. He stated it would be a good idea for GMI to figure out how to tap into these funds.

Municipal Solid Waste Subcommittee Meeting

Summary

The Global Methane Initiative (GMI) Municipal Solid Waste (MSW) Subcommittee (formerly Landfills Subcommittee) conducted its 16th meeting at Singapore's Marina Bay Sands Hotel in conjunction with meetings of the GMI Agriculture and Municipal Wastewater Subcommittees, the WasteMET Asia – ISWA Beacon Conference, the World Cities Summit, and Singapore International Water Week. The MSW meeting included a discussion of the subcommittee leadership, an exchange of ideas for a revised mission statement, a summary of the *International Best Practices Guide for Landfill Gas (LFG) Energy Projects*, and a roundtable discussion of Nationally Appropriate Mitigation Actions (NAMAs). Below is a detailed summary of the topics discussed, as well as a list of meeting action items. The meeting agenda is included in Annex 1.

Attendees from Partner Countries Argentina, China, Colombia, Dominican Republic, Ethiopia, Finland, Germany, Ghana, Indonesia, India, Japan, Mexico, Philippines, Poland, Serbia, Sri Lanka, Singapore, Thailand, Turkey, and the United States participated in the MSW Subcommittee meeting, along with multiple Project Network (PN) members. A meeting participants list is included in Annex 2.

Welcome and Opening

MSW Subcommittee Co-Chair Tom Frankiewicz from the United States Environmental Protection Agency (U.S. EPA) thanked everyone for participating and introduced himself as the new co-chair from the U.S. delegation. Diana Rodriguez Velosa from the Colombian Ministry of the Environment and Sustainable Development introduced herself and explained that she will be assuming Colombia's co-chair responsibilities for Sandra Lopez. The Co-Chairs invited the meeting participants to introduce themselves, and then reviewed and adopted the meeting agenda.

Subcommittee Leadership

The Co-Chairs explained to the meeting participants that each subcommittee may have up to three co-chairs. As the MSW Subcommittee currently only has two co-chairs, there is an available co-chair position. Any delegates interested in becoming a co-chair may contact the ASG (asg@globalmethane.org) for more information about co-chair roles and responsibilities.

Henry Ferland, Co-Director of the GMI Administrative Support Group (ASG), noted that all subcommittees periodically review their leadership, and currently the MSW Subcommittee is able to add an additional co-chair. Interested delegates should feel free to discuss the opportunity to co-chair with their Ministry to acquire any needed internal approvals, and then express their interest to the ASG or the subcommittee co-chairs. If any delegates express interest, the addition of the new co-chair will be discussed at the Methane Expo 2013.

New Mission Statement, Action Plan

Mr. Frankiewicz indicated that with the GMI re-launch, there was an expansion to the former Methane to Markets Partnership scope to include methane abatement and mitigation as well as methane capture and use. The renaming of the subcommittee from "Landfill" to "Municipal Solid Waste" reflects this change in scope and allows the subcommittee to cover methane reduction and avoidance in the municipal waste sector, including organics diversion, landfill gas

flaring, composting, anaerobic digestion, and waste-to-energy. This change in scope should also be reflected in the forthcoming MSW Subcommittee Mission Statement/Action Plan. The Co-Chairs asked the meeting participants if they had any suggestions on how to address this change.

Marlene Sieck from the German Federal Environment Agency noted approval of the broader focus given Germany's strict requirements limiting the waste that may be landfilled. The most effective way to minimize GHG emissions from waste is to limit landfill opportunities and make landfilling more expensive so that there is more incentive to reduce and recycle. Germany employs an integrated waste management approach, which takes into account many factors beyond methane. Ms Sieck suggested the MSW Subcommittee should also consider taking an integrated waste management approach. Mr. Frankiewicz noted there are many factors to consider, but GMI's scope is limited to methane; so while all aspects of an integrated waste management approach should definitely be considered, they should be considered specifically with a focus on reducing methane.

Anil Dhussa from the Indian Ministry of New and Renewable Energy expressed his approval of the new subcommittee name. He noted the expanded scope allows more countries to participate in and benefit from GMI. He believes it is a positive step and allows other waste scenarios to be considered.

Jorge Hilbert from Argentina's Instituto Nacional de Tecnología Agropecuaria (INTA) noted there is a linkage between agriculture and MSW. In Argentina, there is a shortage of nutrients required for crops and these nutrients may be obtained from the organic portion of MSW.

Federico Grullón from the Dominican Republic's National Council for Climate Change and Clean Development Mechanism noted the new name better represents the subcommittee's actions, including waste prevention, landfilling, anaerobic digestion, and incineration. He explained that now, the MSW Subcommittee must decide which areas to focus on, suggesting the subcommittee should focus on methane reduction and not source reduction or recycling because there are other organizations focusing on those issues. He also suggested the subcommittee should share information such as how to: build a good landfill, collect gas effectively, and use anaerobic digestion successfully.

Mr. Ferland asked Ms. Sieck how Germany would like to participate in the Subcommittee, explaining it would be helpful for the ASG to understand how developed countries would like to contribute to GMI. Ms. Sieck responded it might be more important to hear from the countries that are looking for expertise; noting GMI may be able to help to ensure they are planning for recycling and waste reduction. A significant amount of GHG emissions in developing countries is from the waste sector, and it is important to plan ahead to address waste issues.

Mr. Daniel Fikreyesus from Ethiopia's Community Development Research agreed that integrated waste management is important in developing countries. In Ethiopia, waste collection is a problem that needs to be addressed.

Mr. Emmanuel Asimeng from Ghana's Environmental Protection Agency noted that in his country, only a fraction of MSW is collected and very little of the collected waste gets landfilled. Moreover, engineered landfills often fail due to poor management or decreases in estimated waste quantities. Mr. Frankiewicz noted the need for capacity building in the waste sector to improve operations and management of modern sanitary landfills.

Brian Guzzone from Eastern Research Group, Inc. (PN member) suggested the expanded subcommittee scope could allow for more private sector involvement. There are new technologies that can now be applied in the MSW sector that did not apply to landfills, and the PN can share these technologies with GMI. Mr. Frankiewicz agreed that GMI needs to better engage the PN in the MSW sector.

Based on the discussion, the three primary items the Subcommittee needs to better define with respect to its work in the municipal solid waste sector are the following:

1. The role of methane reductions in the context of integrated solid waste management

2. Subcommittee's role in advancing methane reductions in the solid waste sector given GMI's mission and terms of reference.

3. Specific actions by the Subcommittee and partner countries to meet these objectives.

The Co-Chairs recommended that they send a survey to delegates to gain input on these three items that would be reflected in some type of mission statement or updated Subcommittee Action Plan that could be shared with delegates in advance of the 2013 Methane Expo.

International Best Practices Guide for LFG Energy

Mr. Chris Godlove of U.S. EPA, presented a status update on the *International Best Practices Guide for Landfill Gas Energy Projects*. He explained the *Guide* was developed in response to a need identified by the subcommittee for a stand-alone guidance tool for developing these projects. The *Guide* covers the fundamentals of landfill gas collection systems, modeling principles and tools, energy end-use technologies, and regulatory drivers for projects. In addition, the *Guide* includes 15 case studies for successful landfill gas projects in several Partner Countries. The *Guide* was developed with the input of 15 expert reviewers and should be available on the GMI website in July or August 2012.

Mr. Godlove noted that he was attending the ISWA Beacon Conference and was planning to discuss how to best to disseminate the *Guide* to all Partner Countries and stakeholders. Going forward, he indicated there would be a need to help translate the document and GMI would be reaching out to Partner Countries and Project Network members.

Country Updates on Methane Action Plans

Each country delegate was invited to provide an MSW sector country update and comment on the status of their methane action plan and any NAMA work.

Argentina
Mr. Hilbert noted that most of Argentina's population is located in cities so there is a need for better waste management. Also, there is pressure to decrease the use of imported fuels. There are multiple LFG energy projects in Argentina, and there will likely be an increase in these types of projects in the future.

China
Xu Haiyun of the Chinese Ministry of Housing and Urban-Rural Construction provided a presentation that summarized the MSW situation in China. Approximately 61 percent of China's MSW is landfilled, 15 percent is incinerated, and 3 percent is composted. The remaining MSW

(approximately 22 percent) is dumped. There is increasing landfill use in China and increased use of liners and other best management practices. In addition, there are now landfill leachate treatment requirements that help to ensure landfills are operated properly. The Renewable Law has increased landfill gas recovery projects; there are currently 46 LFG projects in China. Challenges in China's waste sector include opposition to waste incineration, the need for household hazardous waste collection, the need for source separation, poor compost quality from composting facilities, and an increase in the number of small landfills (which are not ideal candidates for LFG projects).

Colombia
Ms. Velosa shared a presentation about Colombia's MSW sector. She explained there was a waste dumping ban that required all waste to go to landfills by 2005. Because of this ban, there was a sudden increase in landfilling during that time. But there have been challenges in developing landfills; for example, not all towns have a waste management plan and not all landfills are properly operated or maintained. Also, there are challenges to developing waste to energy projects because there are low energy prices in Colombia and therefore, no incentives to increase biogas use. There are currently four Clean Development Mechanism (CDM) projects from the waste sector in Colombia. In addition in cooperation with GMI, the Colombian government developed a Colombian Biogas Model, which will be used to calculate landfill emissions and construct abatement cost curves.

Ethiopia
Mr. Fikreyesus gave a presentation summarizing Ethiopia's waste sector. Ethiopia's goals are to become a middle income country by 2025 and a Climate Resilient Green Economy (CRGE). The CRGE is part of the national climate strategy, which aims to make Ethiopia carbon neutral by changing business as usual in multiple sectors. "Green Cities" is the CRGE sector that includes solid waste; the development goals in this sector include increasing collection, proper disposal methods and recycling. Ethiopia also has a waste management NAMA underway for large cities. Additionally, Ethiopia's Methane Action Plan is complete and available on the GMI website.

Finland
Petri Kouvo of Finland's Helsinki Regional Environmental Services Authority noted that internationally, Finland works with Ethiopia and Namibia in the waste sector. Domestically, Finland is rapidly moving from landfilling to incineration and recycling. By 2016, it is predicted that only 10 percent of Finland's solid waste will be landfilled. There are currently three incineration plants, but more are being developed to meet the increased demand. Since 1996, the Landfill Act requires all landfill gas to be collected and at least flared. There is currently a tariff for biogas electricity so there will likely be an increase in anaerobic digestion as a means of managing organics instead of composting. Mr. Frankiewicz asked if the tariff requires the biogas to be used to produce electricity. Mr. Kouvo replied the tariff is only for electricity production.

Germany
Ms. Sieck explained that in Germany, all waste that is not recycled goes to incineration or mechanical biological treatment (MBT). Since 2005 strict rules are in place concerning requirements for waste going to landfill. These requirements can only be met by a pretreatment like incineration or MBT. The German Environment Agency is discussing future developments and hopes to achieve a closed cycle system with no waste to incinerate (perspective to 2050 with the goal of a carbon neutral society). The German experience shows that policy drives development and that policy and financial incentives produce results to help reach their goals. Germany has been developing and using all types of waste sector project technologies (e.g.

landfill treatment, anaerobic digestion, incineration and different sort of MBT plants) so there are many experts that can help other countries.

Ghana
Mr. Asimeng noted that 10 percent of Ghana's GHG emissions are from the waste sector. There are landfills in Ghana, but they are not well engineered or properly maintained. There is a Renewable Energy goal to obtain 10 percent of electricity from renewable sources and part of Ghana's carbon development strategy is to reduce emissions from the waste sector.

Indonesia
Ujang Solihin Sidik of Indonesia's Ministry of the Environment provided a presentation about Indonesia's waste sector , which accounts for 11 percent of the country's GHG emissions. The country has a national action plan to reduce GHG emissions, which was adopted in 2011. In Indonesia, 99 percent of waste is categorized as open dumping systems or unmanaged final disposals. There is an ongoing LFG energy project in Jakarta and there were several additional CDM projects planned, but they are no longer moving forward. Challenges to the waste sector include lack of funding, incentives, knowledge, and community cooperation.

India
Mr. Dhussa explained it has only been in the last decade that India has been attempting to convert dump sites into engineered landfills. India is striving for better waste management and increased separation and composting. Composting projects started in the 1980s in India; biogas projects started in the 1990s. Both of these technologies work best on wastes that can be separated such as market waste and restaurant waste. There are currently several projects in the offing for using MSW for generating electricity, including an operating 16MW plant (Okhla) in New Delhi and a 2.5MW gasification plant in Pune under commissioning.

Mexico
Elias Frieg of Mexico's National Water Commission noted that Mexico is committed to reducing GHG emissions. There are currently 15 registered CDM projects, although only three are generating emissions reductions at the present time. The country's largest landfill is the Mexico City landfill, which receives approximately 13,000 tons of MSW per day. This landfill is closing and the Mexico government will be soliciting the assistance of a contractor to develop and build a LFG project. It is estimated this project may produce enough electricity to provide half of Mexico City's public lighting, water pumping, and transportation.

Mr. Frankiewicz asked what barrier(s) might exist regarding the CDM projects. Mr. Frieg replied that CDM emissions reductions are purchased from the least developed countries, so Mexico's emission reductions are not the most likely to be purchased. Because of this, any future carbon market development in Mexico will probably take place in the voluntary markets.

Philippines
Emelita Dimapilis of the Philippine Council for Industry, Energy and Emerging Technology gave a presentation that described a majority of Philippines' current waste disposal is open dumping but there is an increase in sanitary landfill development. There are currently seven LFG projects in the Philippines, and there are regulations that encourage the proper solid waste management and renewable energy production and use. In addition, there is a national solid waste management strategy that includes a focus to reduce disaster and climate change risks. The Philippines has been working to identify and assess project opportunities and support capacity building, training, and technology transfer in the sector. The Philippines has agreed to implement NAMAs and is working to build capacity to develop NAMAs.

Poland
Monika Sklarzewska of Poland's Ministry of the Environment provided a presentation that noted Poland's amount of waste landfilled is decreasing, mostly because industrial waste is being reclaimed or reused. A new act provides for regional landfills that will operate using best management practices.

Piotr Klimek gave a presentation summarizing LFG projects in Poland. He noted 48 percent of biogas projects in Poland are from landfills. Every landfill is required to have leachate and LFG collection systems. The majority (90 percent) of LFG projects include electricity production. There are currently 89 LFG projects in Poland with a capacity of approximately 55 MW. LFG projects are eligible for "green certificates" which increase the price paid for LFG-generated electricity to $80/MWh compared to $62/MWh for conventional electricity.

Serbia
Dusan Milovanovic of Serbia's Faculty of Technical Services explained a waste management strategy including feed in tariffs was passed in 2010, and will be revised in the near future. The country's waste implementation plan stated there should be 26 regions, each with its own landfill. There are currently 24 regions; however, only seven landfills have been created and only five of those are fully operational. Serbia is currently a candidate for participation in the European Union (EU), so the country is preparing a new waste implementation plan with goals that can be attained in the near term. Serbia received a GMI grant to evaluate Serbia's waste sectors and determine the possibilities for biogas use. Serbia's Methane Action Plan is drafted and the final version will be available prior to Methane Expo 2013.

Sri Lanka
P.M.G. Pathiraja of Sri Lanka's National Engineering Research and Development Center gave a presentation that noted local authorities are moving from open dumping to landfilling. However, the landfills are semi-aerobic so there is little methane produced and no possibilities for LFG projects. Therefore, the government would like to move towards anaerobic digestion of the organic portion of MSW. Challenges include the need for waste separation prior to anaerobic digestion. The Sri Lankan Methane Action Plan is not yet drafted.

Singapore
Teo Hock Kheng of the Waste and Resource Management Department explained that Singapore's largest concern is land availability. Because the island is so small, there is a scarcity of land available to build landfills and composting is not appropriate because there is no agriculture on the island to use the compost. For thirty years, incineration has been the most appropriate method of waste management in Singapore. Materials that cannot be burnt and incineration ash is taken to the one existing offshore landfill, i.e. Semakau Landfill. Currently, 60 percent of MSW is recycled and there is a goal is to reach 70 percent by 2030. There are plans to develop an integrated waste management facility by 2018.

United States
Mr. Frankiewicz provided a presentation summarizing the U.S. waste sector status. He noted the new source performance standards and emissions guidelines for landfills are currently being reviewed and that landfills are required to report GHG emissions under the mandatory GHG reporting program. Data from the U.S. GHG reporting program can be accessed on the EPA website. Incentives in the United States include tax credits, renewable portfolio standards, American Recovery and Reinvestment Act grants, and renewable fuel credits. The U.S. Methane Action Plan has been drafted and will be finalized for Methane Expo 2013. The United States has

been participating in NAMA development by assisting with measuring, reporting, and verification (MRV) efforts, and assessing NAMAs in multiple GMI sectors.

NAMAs

Mr. Frankiewicz explained U.S. EPA is currently assessing NAMAs in multiple sectors and is interested in supporting their development through GMI. In addition, EPA is currently participating in theWorld Resources Institute (WRI) emission reduction protocol development efforts that will be critical for development of NAMAs and other emission reduction transactions.

Ms. Velosa provided a presentation on Colombia's NAMA development, which is funded by Environment Canada and is being developed with the Colombian Ministry of Environment and Sustainable Development. A workshop for all stakeholders was conducted in March 2012 and two potential NAMAs were identified: 1) integrated solid waste management including waste separation, recycling and tariff incentives and 2) construction and demolition (C&D) waste including diversion of C&D waste from landfills through reuse, recycling, or waste to energy processes. The next steps include the identification of cities for pilot projects, developing the final stages of the NAMA studies (evaluating financial factors and co-benefits), prioritizing actions, designing the NAMA, and obtaining financing for complete NAMA implementation.

Ms. Sieck inquired why C&D waste was selected since it has little organic matter and therefore produces few methane emissions. Ms. Velosa explained there are issues in Colombia with improper disposal of C&D waste, so the government suggested it be included in a NAMA. Ms. Velosa noted it might be possible that only one of the NAMAs are selected to move forward.

Mr. Fikreyesus indicated that Ethiopia is working on developing a NAMA, which is being funded by the Japanese government. Ethiopia is planning to develop a NAMA for composting to define best practices in composting. He suggested this might be an area where GMI could provide support. Ms. Velosa added that Colombia is considering composting and anaerobic digestion. There are often problems with high prices of composting and poor quality of the produced compost, and she suggested that a case study of successful composting would be useful.

Mr. Guzzone asked if Colombia has considered source separated wastes. Ms. Velosa replied the possibility of source-separated wastes is being taken into consideration in the pilot city selection.

Ms. Sieck inquired if there will be a calculated baseline and potential emissions reductions. Ms. Velosa explained this work will be performed by the Colombian government with assistance from a U.S. non-government organization, Center for Clean Air Policy (CCAP) which is supporting Environment Canada's NAMA development efforts. As this work progresses, Ms. Velosa will provide updates to the subcommittee. Ms. Sieck noted it is important to use methodologies that can be compared.

Mr. Fikreyesus explained that waste to energy is the main project type considered in Ethiopia, but as mentioned earlier, composting is also a possibility. Mr. Milovanovic described that Serbia is working with the Japan International Cooperation Agency to build Serbia's capacity to develop NAMAs. So far, the Serbian government considered 73 possible activities: 16 were selected to be evaluated further and six were selected as NAMAs. Descriptions of the selected NAMAs are being prepared and should be finalized by February 2013. None of the selected activities were in the waste sector due to a lack of sector-specific data.

The Co-Chairs asked meeting participants how GMI can best fit into the NAMA framework, and how GMI could help with NAMA development. Mr. Fikreyesus noted Ethiopia's biggest were lack of capacity and lack of incentives. Mr. Velosa suggested another challenge is lack of knowledge about NAMAs and the NAMA process. Mr. Frankiewicz noted the Canadians are funding NAMA work in multiple countries, which is helping to bring together government officials and raise awareness.

The Co-Chairs inquired if any other countries were developing waste sector NAMAs or supporting waste sector NAMAs in other counties. Mr. Lukman Salifu from Ghana's WasteCare Associates (PN member) noted Ghana is interested in developing NAMAs, but not in the waste sector. Ms. Sieck stated Germany was interested in supporting waste sector NAMAs in other countries, but there are challenges in calculating baseline and MRV. Mr. Frankiewicz pointed out that MRV is a large barrier and one that must be overcome in order to obtain funding for NAMAs.

Mr. Frankiewicz suggested GMI could help by providing a forum for information exchange and developing informational materials on NAMAs. GMI would not duplicate existing available NAMA information (such as from the UNFCCC), but would help to enhance the existing information. In addition, GMI could define what MRV elements might be included for the waste sector and possibly develop an MRV guidance. Mr. Guzzone noted guidance development would help financiers to fund NAMAs by creating a standardized MRV method. Mr. Miguel Franco of TetraTech (PN member) noted that currently, NAMA developers are defining MRV elements themselves so standardization would be helpful. Mr. Bryce Lloyd of OWT (PN member) explained that in China, regional governments are responsible for developing emissions reductions and guidance on NAMAs and MRV would be beneficial to assist them.

Mr. Dhussa suggested GMI could develop an International Best Practices Guide for the waste management sector and not just for landfills. This document could also be beneficial in the development of NAMA and MRV guidance. Mr. Frankiewicz noted additional guides may be developed in the future for other sources.

Mr. Ferland commented on the productive discussion and indicated there is much work to be done; the co-chairs and ASG will plan on future webinars to discuss this further.

Closing

The Co-Chairs thanked everyone for their participation and expressed their hope to see many of the delegates in Vancouver at the Methane Expo in March 2013.

Summary of Action Items

Subcommittee Action Items

- The Co-Chairs will schedule a webinar before Methane Expo 2013, likely during the first week of October. An announcement will be sent out when the date is finalized.
- The Co-Chairs will conduct a survey of the MSW Subcommittee to aid in the development of the new mission statement due to the expanded subcommittee focus.
- The Co-Chairs, with assistance from subcommittee co-chairs, will draft an updated mission statement for the subcommittee based on the input collected through the survey.

This statement will define and clarify the subcommittee's mission and identify the types of activities the subcommittee will pursue. The updated mission statement will be circulated prior to the Methane Expo for subcommittee input, and then posted on the GMI website after approval.

- The ASG will help subcommittee co-chairs to prepare for Methane Expo 2013 by providing abstracts and helping to coordinate a Subcommittee discussion to develop the Expo MSW policy and technical session agenda.

Partner Country Action Items

- Delegates and Project Network members are encouraged to contribute potential speakers and technical topics ideas for Methane Expo 2013. Call for Abstracts deadline is 27 July 2012.

- Delegates interested in the opportunity to serve as subcommittee co-chair will discuss the possibility with their governments and ASG, and be prepared to express their interest at Methane Expo 2013.

- The United States will finalize the *International Best Practices Guide* and post it on the GMI website.

- Delegates should provide the Co-Chairs with suggestions on how best to disseminate the *Guide* to all Partner Countries and stakeholders, and also consider whether they can provide translation services for portions of the document.

- Partner Countries should contribute to the Climate and Clean Air Coalition waste initiative, as discussed during the cross-sector session on 3 July.

Municipal Wastewater Subcommittee Meeting

Summary

The GMI Municipal Wastewater Subcommittee conducted its first in-person meeting on 2-3 July 2012 in Singapore. The first half of the meeting took place in the afternoon of 2 July 2012 and the second half took place on the morning of 3 July 2012. Meeting topics included: a summary of the outcomes of the Internet-based meeting held on 18 April 2012; subcommittee membership and leadership, including the confirmation of two new Co-Chairs: Elias Freig (Mexico) and Federico Grullon (Dominican Republic); country updates from attendees; the Municipal Wastewater Subcommittee Action Plan; and planning for the Methane Expo 2013 in Vancouver, Canada.

The subcommittee meeting agenda is posted on the GMI website and is included as Annex 1.

Presiding over the meeting were Municipal Wastewater Subcommittee Co-chairs: Elias Freig (Mexico, National Water Commission), Chris Godlove (United States, Environmental Protection Agency [U.S. EPA]), and Federico Grullon (Dominican Republic, National Council for Climate Change and Clean Development Mechanism).

Welcome

Co-Chair Chris Godlove began by welcoming everyone to the first in-person meeting of the Municipal Wastewater Subcommittee. He introduced himself and his role at the U.S. EPA (Manager of EPA's Landfill Methane Outreach Program and Co-Chair of GMI Municipal Wastewater Subcommittee). He recognized that some attendees were official delegates of the Municipal Wastewater Subcommittee, and others were participating in an unofficial capacity or simply had an interest in the sector.

Mr. Godlove mentioned all meeting files, including the minutes, will be posted the GMI website soon.

Mr. Godlove stated the Municipal Wastewater Subcommittee is in a unique position as one of the only organizations/initiatives focused on wastewater methane. He then summarized the meeting and subcommittee goals:

- Subcommittee Goals
    - Develop, promote, and facilitate strategies for the abatement, recovery, and use of wastewater methane through:
        - Identification of opportunities.
        - Technology and best practice development, demonstration, deployment, and diffusion.
        - Implementation of effective policy frameworks.
        - Identification of ways and means to support investment.
        - Removal of barriers to collaborative project development and implementation.
- Meeting Goals
    - Provide context of how subcommittee fits within GMI.
    - Allow Partners to update group on status of wastewater initiatives in their countries in order to better understand needs and give opportunity for country-to-country links.
    - Discuss and finalize subcommittee Action Plan.

- Discuss Methane Expo 2013 and ideas for technical sessions.
- Create some ideas for a subcommittee vision going forward (i.e., what is the subcommittee's strategy in the short and long terms).

Mr. Godlove asked if there were any comments or additions to the agenda. There were none so the agenda was adopted.

Mr. Godlove then gave an introductory presentation to set stage for and give context to the subcommittee meeting. Topics covered in the presentation included:

- Goal of subcommittee.
- Subcommittee background (i.e., how the subcommittee got to where it is now).
- Description of methane emissions from the wastewater sector.
- Clean energy benefits of methane reduction, recovery, and use.
- Mitigation options.
- Challenges/barriers to methane reduction, recovery, and use.
- Areas of potential subcommittee engagement.

At the conclusion of the presentation, Mr. Godlove asked if there were any questions or comments:

Jorge Hilbert (Argentina, INTA) stated he is always hearing about the growth of emissions and said that one-third food is being thrown away. There needs to be more of a focus on how to prevent emissions rather than solely on how to deal with existing problem (i.e., if we don't change the paradigm and follow the same course of development, we'll all be in trouble).

Daniel Fikreyesus (Ethiopia, Community Development Research) stated Ethiopia's community plan addressed the issue of operating under business as usual and the actions that can be taken to change.

Aleixo Dellagnelo (Brazil, AgE Tecnologia Ltda.) stated that organizing an industry task force within countries should be an emphasis of subcommittee.

Summary of Internet-Based Meeting and Action Items

Mr. Godlove stated this meeting is building on the progress that was made at the first official Municipal Wastewater Subcommittee meeting held via Internet on 18 April 2012. He then provided a summary of the Internet-based meeting discussion and outcomes.

During the April 2012 Internet-based meeting, the Municipal Wastewater Subcommittee discussed the new subcommittee and its objectives, subcommittee membership and leadership, the ongoing development of a sector Action Plan, ideas and plans for the first in-person meeting taking place in Singapore, and plans for the Methane Expo 2013.

The meeting was attended by 17 representatives from 10 different countries: Brazil, Colombia, Finland, Ghana, Indonesia, Italy, Japan, Mexico, Turkey, and the United States. Presiding over the meeting was Municipal Wastewater Subcommittee Co-Chair Chris Godlove, U.S. EPA, and Henry Ferland, Co-Director of the GMI Administrative Support Group (ASG).

A major meeting focus was discussion of the draft subcommittee Action Plan. Attendees provided input on the draft, which has been incorporated into a revised version.

Municipal Wastewater Subcommittee Membership and Leadership

Mr. Godlove introduced the topic of subcommittee membership and leadership, stating that official delegates comprise government representatives or government-nominated representatives. Mr. Godlove went on to explain the GMI Terms of Reference (TOR) allow for up to three co-chairs of a subcommittee, and that co-chairs have an important role in setting the agenda and direction for subcommittee activities.

Mr. Ferland explained the previous process for identifying and selecting co-chairs has been to solicit leadership interest prior to subcommittee meetings, and then allow for subcommittee time to discuss nominations.

Mr. Godlove asked if there were any volunteers for co-chairs, and if so, for delegates to please explain their interest in serving.

Elias Freig (Mexico, National Water Commission) expressed interest in serving as a co-chair, and that GMI had received a letter indicating his and Mexico's intent. Mr. Freig explained one of the primary reasons for Mexico's interest in the Municipal Wastewater Subcommittee is that Mexico is a top emitter of wastewater methane and feels a responsibility to help mitigate emissions. He also explained that Mexico is at a critical tipping point, having just passed a national climate change law, and with the right guidance from GMI, he believes there is a great opportunity to help shape effective by-laws that puts best practices into action. Mr. Freig went on to explain that Mexico can serve as a showcase for a middle-income emerging country, and he has a high desire for Mexico to have a big impact in the field of wastewater methane mitigation.

Federico Grullon (Dominican Republic, National Council for Climate Change and Clean Development Mechanism) also expressed interest in Dominican Republic serving as a co-chair. Mr. Grullon explained that as a developing country, he feels it is important for the Dominican Republic to support GMI. He also explained the Dominican Republic is working on a climate change law and GMI involvement presents a great opportunity to help shape effective policy. Mr. Grullon stated that Omar Tejada will serve as the official Co-Chair from Dominican Republic.

There were no other expressions of co-chair interest to Mr. Godlove called for a second motion for Mr. Freig and Mr. Grullon to serve as co-chairs. Anil Dhussa (India, India Ministry of New and Renewable Energy) seconded. There were no objections so Mr. Freig and Mr. Grullon joined Mr. Godlove as official co-chairs.

After the discussion of subcommittee leadership concluded, Charlie Goff (United States, Eastern Research Group) provided a summary of the Project Network for attendees, stressing the importance of private sector involvement in GMI. Mr. Goff explained GMI includes a Project Network that facilitates communication, project development and implementation, and private sector involvement. This network assists with reaching out to and organizing the efforts of the private sector, the research community, development banks, and other governmental and nongovernmental organizations with interests and expertise in methane recovery and use. Active involvement by Project Network members is essential to building capacity, transferring technology, and promoting private direct investment that will ensure the Initiative's success. Mr. Goff tasked all attendees to actively recruit Project Network members.

Mr. Ferland followed up by stating the Project Network is essential for bringing technical expertise to subcommittee activities. He stated the Project Network understands the real world,

what works/doesn't work, and are very much welcome and encouraged to attend subcommittee meetings.

Anil Dhussa (India, India Ministry of New and Renewable Energy) offered a word of caution. He stated that Indian Ministry of New and Renewable Energy is only involved with utilization of biogas from wastewater for energy recovery, and not setting up of wastewater treatment facilities. India has a reasonable exposure to technologies available in market. He stated that recently there have been proprietary technologies entering the market, and the subcommittee needs to make sure it does not get caught up in focusing on technologies from companies that have a vested interest in promoting their own technology. The subcommittee needs to focus on those technologies that are best at mitigating, recovering, and using wastewater methane.

Jorge Hilbert (Argentina, INTA) added the subcommittee needs to clarify whether it is focusing on municipal wastewater treatment only or all wastewater treatment (including agro-industrial wastewater). Mr. Godlove stated the subcommittee Action Plan is the place to resolve issues like this and it clearly states the subcommittee focus will be on municipal wastewater only. Mr. Dhussa followed up by stating that agro-industrial wastewater will be a focus of the Agriculture Subcommittee.

Brian Guzzone (United States, Eastern Research Group) expressed a difficulty in engaging the private sector is explaining their role in GMI and associated meetings. Mr. Guzzone said the Methane Expo 2013 in Vancouver would be a good venue to provide rationale for Project Network involvement and their role.

Country Updates

Each Partner delegate was given an opportunity to present an update of the status of wastewater activities in their country:

Diana Rodriguez (Columbia, Colombia Ministry of the Environment and Sustainable Development) – Presentation slides available. Highlights included:

- Wastewater treatment coverage in Colombia increased from 8 percent in 2003 to 27.5 percent in 2010. There is a goal of reaching 36 percent coverage in 2014, but that goal is considered optimistic.
- Twelve percent of Clean Development Mechanism (CDM) projects in Colombia are wastewater-related. Most have stayed in early stages of development, and only one wastewater project is registered which is at validation stage for producing certified emissions reductions (CERs).
- There is great potential in the agro-industrial wastewater sector for methane reduction, recovery, and use since lagooning is common practice.
- The main barriers to wastewater methane reduction, recovery, and use in Colombia include:
    - Low cost of energy production.
    - Low GHG emissions reduction potential because Colombia has a relatively clean energy grid (high percentage of hydroelectricity).
    - There are no policy drivers for biogas use.
    - There have been difficulties with technology transfer.

Federico Grullon (Dominican Republic, National Council for Climate Change and Clean Development Mechanism) – Presentation slides available. Highlights included:

- There are approximately 56 wastewater treatment facilities in the Dominican Republic. Nineteen of these facilities use mechanical aeration, but only six are operating efficiently. All of the treatment facilities with anaerobic technologies are emitting methane to the atmosphere (including upflow anaerobic sludge blanket reactors [UASBs]).
- Only 13.8 percent of the wastewater flow in Santo Domingo is collected, and only 37 percent of that flow is sent to treatment facilities. However, these treatment facilities are not operated efficiently.
- Wastewater treatment coverage is only 35 percent nationally.
- Sixty-five percent of the wastewater treatment facilities in the Dominican Republic are not operational right now.
- Potential methane emissions reduction from wastewater treatment is approximately 186,354 tons CO_2e/year
- Santo Domingo is developing a "Sanitary Master Plan" which includes steps to increase treatment coverage.
- The main barriers to wastewater methane reduction, recovery, and use in the Dominican Republic include:
    - Lack of data on GHG emissions.
    - Lack of expertise or awareness of recovery and use technologies.
    - Electric grid is unreliable.
    - Lack of policies promoting biogas use.
    - No national regulation for design, construction, and operation of wastewater treatment facilities.
    - Lack of financing for wastewater projects.
    - High costs of recovery and use technologies.
- There is a renewable energy law that may provide incentives for wastewater treatment projects.

Xu Haiyun (People's Republic of China, China Ministry of Housing and Urban-Rural Construction) – No presentation slides. Highlights included:

- In 2010, 80 percent of the population was covered by wastewater treatment coverage. The coverage goal for 2020 is 90 percent.
- One of the main challenges in China is that only 1 percent of wastewater treatment facilities have anaerobic digestion for sludge due to relatively low organic content. Most of the sludge is dumped and there is no clear policy with respect to wastewater treatment.

Daniel Fikreyesus (Ethiopia, Community Development Research) – No presentation slides. Highlights included:

- There is a committee exploring wastewater treatment options in Ethiopia. Wastewater treatment options are also being considered as part of Nationally Appropriate Mitigation Action Plans (NAMAs).

Mari Heinonen (Finland, Helsinki Regional Environmental Services Authority) – Presentation slides available. Highlights included:

- Eighty percent of the population in Finland is connected to wastewater treatment facilities.
- There are 540 wastewater treatment facilities in Finland. The treatment process typically combines organic material and Nitrogen removal plus chemical precipitation of Phosphorus.
- Ten of the treatment facilities can be considered very large.

- Reduction levels at wastewater treatment facilities for selected elements include: biochemical oxygen demand (BOD) - 97 percent; Phosphorus - 96 percent; and Nitrogen – 56 percent
- Eighteen treatment facilities have digesters. Eight have combined municipal sludge and biowaste, and there are four industrial treatment facilities.
- There is biogas production at 60 percent of wastewater treatment facilities that serve more than 10,000 people. Electric production from this biogas is 27 gigawatt hours (GWh), and heat production is 80 GWh.
- Most treatment facilities with biogas generation utilize combined heat and power (CHP), but some only produce heat.
- Helsinki began a new initiative in June 2012 to measure process gas emissions online at wastewater treatment facilities (CO_2, N_2O, etc.).
- The main barrier to wastewater methane reduction/recovery is that most treatment facilities are small so there is often insufficient sludge to produce enough economic biogas. There is strong pressure to load digesters with biowaste to enhance biogas production.

Emmanuel Theodore Asimeng (Ghana, Environmental Protection Agency) – Presentation slides available. Highlights included:

- Forty-nine percent of the Greater Accra Region has access to a treated water supply; however, the national average is lower.
- The primary wastewater treatment methods are stabilization ponds, trickling filters, and activated sludge.
- Only about 50 installed wastewater treatment facilities are operational.
- There are currently no methane recovery, reduction, and use initiatives at any facilities, and no clear policy right now to do so.
- There are some biogas systems in schools and domestic units.
- The main barriers to wastewater methane reduction, recovery, and use in Ghana include:
    - Lack of available financing for wastewater projects.
    - Limited institutional capacity related to wastewater treatment.
    - Lack of support for research and development (R&D).
    - Jurisdictional complexity.
    - Social acceptance (i.e., some communities don't want treatment facilities in their area).
    - Lack of private sector involvement.
    - Land acquisition problems.
- Despite these challenges, there are some drivers for action such as the existence of biogas projects in schools, the renewable energy law, and recent concern about environmental quality at the policy and community levels.

Anil Dhussa (India, India Ministry of New and Renewable Energy) – No presentation slides. Highlights included:

- A study in India was conducted study a few years ago to better understand the potential for energy recovery at wastewater treatment facilities. The study found here were approximately 100 digesters that generate biogas, but many of these are leaking. Some treatment facilities had converted diesel engines to use biogas, but some did not.
- An experimental 500 kilowatt (kW) project was developed in the city of Sural and three more projects followed the next year.
- Today, there are nearly 10 projects generating power for a total capacity of approximately 10 megawatt (MW), and there are new projects being developed.

Rudi Arifin (Indonesia, Indonesia Ministry of Public Works) – Presentation slides available. Highlights included:

- There is approximately 5.6 million tons/day of untreated wastewater in Indonesia.
- Currently, 55.6 percent of households have access to basic sanitation, and there is a goal to increase this to 62.4 percent in the next three years. Public access to adequate sanitation services remains challenging; there needs to be a breakthrough.
- Indonesia has 150 septic treatment plants but 90 percent of them are not working.
- Indonesia has a national policy with targets for near-term development of wastewater treatment infrastructure. This plan includes a community-based sanitation program that has a goal of improving sanitation quality for low income people.
- The main lesson learned from recent sanitation development is that bottom up planning needs to be combined with top down planning.

Makoto Shirasaki (Japan, Ministry of Land, Infrastructure, Transport and Tourism) – Presentation slides available. Highlights included:

- There are approximately 2,100 wastewater treatment facilities in Japan, most of which are aerobic.
- Material use of sludge has steadily increased since revision of the Sewerage Law in 1996.
- The biomass recycle rate is 24 percent, and the rate for energy generation is 13 percent.
- Digesters are in place at approximately 300 treatment plants, and about 70 percent of the biogas that is generated is utilized: 20 percent for electricity and 30 percent for heating digester tanks.
- Japan's goal is to develop low cost and high efficiency energy utilization technologies and then to make wastewater treatment plants Energy Supply Hubs.
- On 1 July 2012, Japan instituted a feed-in tariff requiring utilities to purchase electricity generated from renewable energy sources including biogas at a fixed price.

Elias Freig (Mexico, National Water Commission) – Presentation slides available. Highlights included:

- There are 2,719 wastewater treatment facilities in Mexico, but almost half of them don't work on a regular basis.
- Currently, 44.8 percent of wastewater in Mexico is treated. In 2000, only 23.8 percent of the wastewater was treated, and goal for 2012 is to have 60 percent of the wastewater treated.
- Most wastewater treatment is through lagoons and activated sludge. There are some anaerobic digester systems.
- Only 20 of the treatment facilities in Mexico are good examples of biogas utilization, but only four of these are doing it in an efficient manner.
- The Atotonilco Wastewater Treatment Facility is a huge 23 m^3/second, project with significant emissions reduction potential, biogas utilization and even a CDM has been developed that it is in the Validation process that could reduce close to 400,000 tCO_2e/per year.
- Wastewater emissions are expected to grow 22.6 percent by 2020.
- The main barriers to wastewater methane reduction, recovery, and use in Mexico include:
    - Lack of financing for wastewater treatment projects. There are no specific budget resources for projects.
    - The capture of methane and use of biogas is not regulated in the water treatment sector so it is hard to justify the investment needed.
    - Cultural barriers (e.g., lack of knowledge; resistance to change).

- Some of Mexico's goals include having an action plan in place by December 2012 or January 2013; launching a bi-national, tri-national, or regional pilot project in 2013 between Mexico and the United States and maybe also Guatemala; and establishing a methane – biogas base energy "factory" across the Mexican north and south borders by 2013-2014.

P.M.G. Pathiraja (Sri Lanka, National Engineering Research & Development Center) – No presentation slides. Highlights included:

- There is not much activity in Sri Lanka's municipal wastewater treatment sector, as most activity is on the industrial side.

Erkan Karisli (Turkey, Ankara Greater Municipality) – Presentation slides available. Highlights included:

- There are 631 wastewater treatment facilities in Turkey.
- Approximately 81 percent of the population is served by wastewater treatment facilities.
- Turkey's National Climate Change Plan (developed in 2011) calls for increased energy production from biogas.
- The Ankara Wastewater Treatment Facility produces and captures biogas to generate electricity (1.65 MW, representing 80 percent of the facility's needs).
- Renewable energy sources are subsidized by the Turkish government, and electrical energy from renewable resources is purchased by governments.
- There are multiple government programs related to wastewater treatment and methane emissions.

At the conclusion of country updates, the Municipal Wastewater Subcommittee meeting adjourned for the day.

On the morning of 3 July 2012, the Municipal Wastewater Subcommittee meeting reconvened. Mr. Godlove reviewed the activities that took place the previous day, which included providing context and an overview of the subcommittee; summarizing the discussion and outcomes from the April 2012 Internet-based meeting; and hearing from country representatives about the wastewater activities taking place in their respective countries.

Mr. Godlove stated the goals for the second day were to discuss the Municipal Wastewater Subcommittee Action Plan; discuss the Methane Expo 2013 in Vancouver; and review the outcomes and next steps from the meeting.

Municipal Wastewater Subcommittee Action Plan

Mr. Ferland began the conversation about the subcommittee Action Plan by describing what the Action Plan is and providing a summary of the Action Plan development process. Mr. Ferland stated that Action Plans were initially conceived under Methane to Markets as a way for each subcommittee to address the focal areas in which it will focus. He also stated that GMI now has country-specific Action Plans, but the first step is to develop an overall sector-specific Action Plan. Mr. Ferland said there were good comments received during the April 2012 Internet-based meeting on the first draft of the Action Plan. These comments included the following:

- Several attendees said the Action Plan should address the wastewater treatment situation in both developing and developed countries.
- Mexico stated there is a trend towards more UASBs being used in Mexico and this should be an important subcommittee consideration. Brazil reinforced that point by

saying that they have 500 UASBs in Brazil and believe that approximately 30 percent of the methane produced is being released and not used.

- Several attendees stated the importance to consider differences between a centralized and decentralized focus. Large wastewater treatment facilities are expensive, and smaller systems are often not operated correctly.
- Several attendees stated that energy from methane is very important. Many facilities are in place but not operated efficiently. Electricity prices are often low, which makes the use of biogas economically unattractive.

Mr. Ferland stated the revised Action Plan addressed these comments, and the goal of the current meeting is to review the revised Action Plan and move towards finalizing it.

Mr. Godlove followed up by providing an overview of how the subcommittee will use the Action Plan. He stated that it will serve as an overall guide of subcommittee activities, and will provide structure and direction as country-specific Action Plans are developed. He also stated the subcommittee Action Plan can be used by external groups (e.g., multilateral/development banks) to provide background on what GMI is doing to help facilitate action, and that the Action Plan will help direct the focus of the subcommittee's technical assistance activities.

Mr. Godlove then provided an overview of the Action Plan by walking through each of the sections, and then asked for comments and discussion from attendees.

Lukman Salifu (Ghana, WasteCare Associates) interjected and asked that some time be set aside for subcommittee members to offer comments/thoughts on the country updates presented on the previous day. Mr. Godlove welcomed Mr. Salifu suggestion to offer comments and asked for him to provide some initial thoughts on the Action Plan as well. Mr. Salifu stated that in Ghana, when plants are shut down due to lack of electricity, they are often vandalized. He expressed interest in knowing what kinds of systems other countries are using (specifically Japan). He stated that Ghana may not want to pursue UASBs, and that maybe simple digesters are a better option. He also stated a high-level of interest in learning more about the kinds of systems that can be used to retrofit existing facilities.

Mari Heinonen (Finland, Helsinki Regional Environmental Services Authority) stated one of the main issues is lack of sanitation. She said that water quality and sanitation is a separate issue from methane, but methane problems can be solved with enhanced sanitation. She suggested countries should focus on proper operation and maintenance of existing facilities then consider options for improving situation. She went on to say energy development is the result of years of development, and not something that can be implemented right away in situations where there is lack of sanitation.

Mr. Godlove affirmed that operation and maintenance (O&M) is very important, but GMI is not the proper forum to address basic sanitation needs of countries.

Anil Dhussa (India, India Ministry of New and Renewable Energy) stated technologies can often be condemned for no fault of their own due to improper O&M, lack of infrastructure to support technology, inability to use gas, etc. He said in some cases it may be important to simply flare biogas rather than have methane emitted directly into atmosphere. Mr. Dhussa said India is having success with UASBs followed by membrane bioreactors (MBR), and that GMI should develop a document that provides guidance on the selection of technologies based on different situations. He said the document should spell out the dos and don'ts for various technologies, and GMI should avoid supporting technologies that aren't appropriate for certain situations.

Lukman Salifu (Ghana, WasteCare Associates) added that knowing the pros and cons of technologies is important, and building local O&M capacity is also very important.

Elias Freig (Mexico, National Water Commission) followed up on Mr. Dhussa's suggestion on the development of a technologies guide, adding it may also serve to compile a list of successful and unsuccessful stories. He said that both types of experiences and case studies can be a really effective tool to gain knowledge and serve as a guide for country wastewater treatment development. He offered Mexico to be considered for future case studies development.

Mr. Godlove said case study development can be an important topic for discussion at the Methane Expo in Vancouver. He said highlighting case studies that have been successful or unsuccessful could be a way to catalog the various wastewater situations being experienced.

Mr. Godlove brought up the issue of technologies, stating Brazil has talked about the importance of UASBs in the past. Mr. Godlove said the Action Plan is trying to be technology neutral to leave it open for countries to pursue technologies that make the most sense for them. He reminded attendees GMI is focused on addressing methane in wastewater treatment and not expanding wastewater treatment access. He asked for responses/comments from attendees.

Anil Dhussa (India, India Ministry of New and Renewable Energy) reminded delegates the subcommittee is not only looking at methane recovery and use, but also methane abatement and mitigation.

Mr. Godlove referenced Table 2 in the Action Plan, and asked attendees if there were any comments or thoughts. He stated the installation of sludge digesters has been a focus in the United States, and asked if this would be a useful focus in a global context.

Mari Heinonen (Finland, Helsinki Regional Environmental Services Authority) reiterated the importance of O&M at existing facilities and the importance of having an O&M plan in place when investments in new systems are made as a way to prevent failures.

Mr. Godlove confirmed the Action plan should state the importance of O&M as a means to mitigate emissions.

Mr. Godlove asked for any further comments on this section of the Action Plan and there were none.

Mr. Godlove turned to Section 6 of the Action Plan: Outreach and Collaboration Opportunities. He asked for comments or thoughts on the types of organizations that have been included, and if there are any other groups that should be included.

Elias Freig (Mexico, National Water Commission) stated the Global Water Partnership (GWP) is part of the World Economic Forum, and that regional development as well as national and local commercial banks should be included. He also suggested the subcommittee should perhaps engage engineering associations with research institutions that could transfer knowledge to GMI and legitimize GMI activities.

Mr. Godlove asked if there was any other input, and said it sounded like attendees are comfortable with the current form the Action Plan with the addition of the items discussed (i.e., development of case studies, address importance of O&M).

Mr. Ferland stated the subcommittee needs to finalize the Action Plan so countries have guidance as they develop country-specific Action Plans, but that the subcommittee can also change it in the future. . He noted the subcommittee could adopt the current version now, or make modifications and then approve via email. Mr. Ferland recommended the subcommittee adopt the current version of the Action Plan now since everyone seemed comfortable with it.

Mr. Godlove made a motion to adopt the Action Plan as it stands. Mari Heinonen (Finland) seconded. There were no objections so the Action Plan was adopted.

Methane Expo 2013

Mr. Ferland started the discussion by summarizing the three critical issues:

1. The subcommittee needs to develop the technical and policy agenda for the wastewater track. The subcommittee provides key influence for developing the topic areas. The abstract process is already in place but the subcommittee needs to review and approve the abstracts. It is important to first develop the topic areas that the subcommittee wants covered as a means of helping with abstract identification.
2. The Exposition part is important. The Expo will have an exhibition of posters highlighting project opportunities and/or success stories from GMI member countries. The subcommittee will be responsible for finding success stories or identifying proposed projects that are in need of funding or technical expertise. Mr. Ferland asked all members to think about success stories to highlight.
3. There will be booths available to all countries (free to any country that wants one). If a country has a booth, it needs to think about what should be highlighted in that booth.

Elias Freig (Mexico, National Water Commission) suggested that each member identify one success story; one failure; and one technical abstract. He also suggested countries identify potential projects so matches can be made at the Expo between those projects and organizations that can help develop those projects. He also suggested developing a "piggyback" strategy with the CCAC to complement and take advantage of the synergies with this initiative that was been launched and has been promoted at the Ministers level.

Jorge Hilbert (Argentina, INTA) said it would be beneficial to identify Canadian experiences for each of the sectors, and it would be nice to have electronic versions of the posters at the Expo since it can be expensive to develop hard copy posters.

Mr. Ferland said the ASG is actively engaging with Canadian colleagues. For example, there is a very good wastewater treatment facility in Vancouver that can host a site tour or serve as a case study presentation at the Expo. Mr. Ferland said Canada will be actively engaged throughout the process, and that Canada will want to propose Canadian speakers to fill in any gaps. He also said the subcommittee needs to be flexible to allow for Canadian participation. He said the ASG has received one Canadian wastewater abstract to date. With respect to posters, Mr. Ferland said the Expo organizers are still thinking about the best way to showcase posters, but they definitely want them to be interactive and exciting.

Mr. Godlove said posters can present project opportunities as well. He echoed Mr. Freig's suggestion that each member should identify projects and abstracts. He asked if any assistance might be helpful as countries pursue opportunities, and if there were any thoughts from members on projects that would make good candidates for abstracts or posters.

Diana Rodriguez (Colombia, Colombia Ministry of the Environment and Sustainable Development) said Colombia plans to open a second wastewater treatment facility in Bogota that might be a good project opportunity to highlight.

Elias Freig (Mexico, National Water Commission) stated the Empresas Publicas de Medellin water agency in Colombia is doing really good work that could serve as s successful story in developing nations as it is operating as a for profit public entity that has even diversified to other industries. Mexico´s Monterrey and Tijuana cases are also worth exploring.

Makoto Shirasaki (Japan, Ministry of Land, Infrastructure, Transport and Tourism) indicated Japan will introduce a case study.

Allison Costa (United States, Environmental Protection Agency) brought up a Water Environment Federation (WEF) study on barriers to biogas utilization, and that the Water Environment Research Foundation (WERF) is doing a follow-up study to identify wastewater treatment facilities that have methane recovery and use.

Jorge Hilbert (Argentina, INTA) suggested the subcommittee should contact Santiago, Chile (La Farfana) as a case study.

Mr. Godlove asked for any additional comments, and there were none. He suggested the co-chairs set up a follow-up discussion to identify more specific guidance for subcommittee members, and develop a framework for the Expo wastewater sessions. He stated the Expo planning is an ongoing process, and there are approximately 8 months before Vancouver. He said it makes sense for the subcommittee to reconvene via internet in next couple of months (around September) to discuss the list of recommended topic areas, and then have the subcommittee work on identifying speakers.

Mr. Ferland stated having the co-chairs develop an initial list of topics and having that list serve as a focus of a follow up internet meeting is a good idea.

Outcomes and Next Steps

Mr. Godlove asked for any meeting reactions and impressions from Mr. Freig and Mr. Grullon.

Elias Freig (Mexico, National Water Commission) expressed happiness in meeting everyone, and thanked the subcommittee for allowing him to serve as one of the co-chairs. He said the subcommittee has lots of technical expertise, and provides a unique platform to show that wastewater methane projects are good for the environment but also good for the economic bottom line but the case has to be made. He stressed the subcommittee has a unique opportunity to make the Methane Expo 2013 the best one ever. He provided a rally cry for members to identify speakers and case studies. He also stated the subcommittee should make a strategic alliance with the CCAC and craft a win – win relationship were GMI´s Subcommittee becomes the technical arm of CCAC, and CCAC could serve the political muscle for GMI´s methane initiatives worldwide.

Federico Grullon (Dominican Republic, National Council for Climate Change and Clean Development Mechanism) echoed Mr. Freig's statements and said he is looking forward to contributing and thanked everyone for their participation.

Mr. Godlove followed up by thanking the subcommittee members for all of their time and thanking Mr. Freig and Mr. Grullon for serving as co-chairs.

Mr. Godlove summarized the action items/next steps for the subcommittee:

- The ASG will post the country updates and other meeting materials on the GMI website.
- Mr. Godlove, Mr. Freig, and Mr. Grullon will coordinate the incorporation of the final comments on the Action Plan into a final version and the ASG will post it to the GMI website.
- Mr. Godlove, Mr. Freig, and Mr. Grullon will develop a list of potential wastewater topics and speakers for the Methane Expo 2013 in Vancouver, Canada, and distribute to subcommittee members for review.
- The subcommittee will convene via an Internet-based meeting in October/November 2012 to discuss wastewater topics and potential speakers. The ASG will send out date options and select the best one.
- All subcommittee members will develop list of case studies and presentation ideas for the Methane Expo 2013.

Mr. Godlove concluded the meeting by asking if there were any final comments. There were none so the meeting was adjourned.

Agriculture Subcommittee Meeting

Summary

The Global Methane Initiative (GMI) Agriculture Subcommittee conducted its 12th meeting at Singapore's Marina Bay Sands Hotel in conjunction with GMI Municipal Solid Waste and Municipal Wastewater Subcommittees meetings, the WasteMET Asia – ISWA Beacon Conference**,** the World Cities Summit, and Singapore International Water Week. The meeting included a discussion of the subcommittee's Statement of Purpose, future projects, and plans for Methane Expo 2013. Below is a summary of the topics discussed, as well as a list of the meeting's action items. The meeting agenda is included in Annex 1.

Delegates from Partner Countries Argentina, Ethiopia, India, Philippines, Thailand, and the United States participated in the Agriculture Subcommittee meeting, along with multiple Project Network (PN) members. A list of all meeting participants is included in Annex 2.

Welcome

Co-Chair Jorge Hilbert of Argentina's Instituto Nacional de Tecnología Agropecuaria (INTA) welcomed meeting participants on behalf of the Agriculture Subcommittee and introduced his fellow co-chairs, Allison Costa of the U.S. Environmental Protection Agency (U.S. EPA) and Anil Dhussa of India's Ministry of New and Renewable Energy (MNRE). This was followed by review and adoption of the agenda for the subcommittee meeting.

Statement of Purpose

Ms. Allison Costa made a presentation summarizing the Agriculture Subcommittee Statement of Purpose development. She explained the Agriculture Subcommittee was experiencing diminishing participation and there are a number of new subcommittee delegates who have not yet attended any meetings. To determine the causes of the lack of participation, Ms. Costa contacted all subcommittee delegates. Many delegates reported they did not participate more actively due to the subcommittee's lack of focus and/or a shortage of funds or availability to travel to meetings.

As a means to encourage greater participation, better define the subcommittee's focus, and make the subcommittee more beneficial to its members, the co-chairs decided to develop a subcommittee Statement of Purpose. As a first step, the GMI Administrative Support Group (ASG) conducted an Agriculture Subcommittee delegate survey to determine which focus areas they might select for the subcommittee and what roles they are interested in playing. Next, the ASG researched guidelines on Statement of Purpose development and decided that it should be brief for people to remember and clearly define the organization's goals.

Based on the survey results and the guidelines, the co-chairs and ASG developed the draft Statement of Purpose. The document defines the subcommittee's mission, focus, and the delegates' and PN members' roles. The draft Statement of Purpose was sent out to the subcommittee delegates and PN members prior to the meeting for review and comments along with some discussion questions.

Ms. Costa noted the first set of discussion questions were about enteric fermentation, including:

- Should the subcommittee take a more active role in addressing enteric fermentation?

- If so, what actions should the subcommittee take to incorporate enteric fermentation?
- Alternatively, should the subcommittee only work with other organizations to address enteric fermentation? (As was discussed at the March 2010 Agriculture Subcommittee meeting in New Delhi, India.)

Mr. Hilbert recalled the New Delhi meeting had speakers from organizations that focus on enteric fermentation and rice cultivation. He noted it would be beneficial for GMI to keep track of these organizations' activities and progress.

Henry Ferland, ASG Co-Director, explained since the subcommittee has traditionally focused on anaerobic digestion (AD), the inclusion of enteric fermentation would require a different set of expertise. The subcommittee's strength and knowledge is currently AD, so it might be best to focus on AD and not include enteric fermentation.

Daniel Fikreysus of Ethiopia's Community Development and Research stated the International Livestock Research Institute (ILRI) has studied enteric fermentation emissions reductions and GMI might be able to play a role in helping ILRI implement their research and develop projects.

Aleixo Dellagnelo from AgE Tecnologias (PN member) agreed there are other organizations working with enteric fermentation. For this reason, he recommended that GMI continue to focus on AD and not enteric fermentation.

Brian Guzzone of Eastern Research Group, Inc (PN member) stated enteric fermentation projects are more research oriented, whereas AD projects provide near term and measureable methane reductions. Mr. Hilbert replied there are proven methods to reduce enteric fermentation emissions that could be developed into projects now.

Ms. Costa summarized the discussion by stating enteric fermentation will not be a current subcommittee focus, but the subcommittee will keep current on what is happening within the enteric fermentation realm.

Ms. Costa asked if any meeting participants had comments relating to the second set of questions, which focused on rice cultivation:

- Should the subcommittee exclude rice cultivation?
- Should the subcommittee work with other organizations to address rice cultivation, if the opportunity should arise?

None of the meeting participants felt strongly about including or excluding rice cultivation. Ms. Costa suggested rice cultivation not be included as a subcommittee focus.

Ms. Costa read the final discussion questions regarding delegate participation:

- Should delegates be required to meet a minimal level of participation?
- If so, what should that level of participation include?

Ms. Costa explained the roles of delegates and PN members in the draft Statement of Purpose are not requirements, and delegates and PN members do not have to participate in all ways listed. Mr. Ferland noted required participation has been discussed at the GMI Steering Committee in the past and the Steering Committee decided not to develop requirements. Delegates' positions and governments change and each country has its own set of priorities so it is difficult to establish requirements, especially given GMI is a voluntary program with no monetary reimbursement.

Mr. Hilbert suggested each country could at least be required to designate delegates annually. Mr. Hilbert noted, however, this is ultimately a decision of the Steering Committee so the Agriculture Subcommittee would have to raise it to the Steering Committee level.

Mr. Costa thanked the meeting participants for their Statement of Purpose input and she encouraged any additional input to be sent to the ASG (asg@globalmethane.org). She noted the co-chairs are striving to have the Statement of Purpose bring value to the subcommittee, so they would appreciate any input to improve or strengthen. Mr. Ferland noted the statement's development is a valuable exercise and one that other subcommittees will likely replicate. He congratulated the subcommittee on this effort and stated it will bring value to the Agriculture Subcommittee and to GMI.

Country Updates

Mr. Hilbert asked each agricultural country delegate to provide a brief update on their country's agriculture sector and agricultural methane recovery projects, and to share their input on the Statement of Purpose.

Argentina. Mr. Hilbert delivered a country update for Argentina. He noted AD projects have increased approximately 19 percent in the last 5 years in response to energy need and high electricity prices in Argentina. Although Argentina has experienced some bag digester failures, there are two new codigestion AD projects (3 and 5 MW) and new AD demonstration projects. In addition, Argentina is performing resource assessments (RAs) at the provincial level.

Ethiopia. Daniel Fikreysus of Community Development and Research provided a presentation which noted that agriculture is an important sector for Ethiopia as it employs the majority of the work force and provides a significant portion of the GDP. Agriculture also comprises approximately 70 percent of Ethiopia's GHG emissions. Ethiopia has a national climate strategy, known as the Climate Resilient Green Economy (CRGE), which aims to make Ethiopia carbon neutral by changing business as usual in multiple sectors including livestock. Currently, Ethiopia has a large number of livestock but low production; future plans are to improve livestock to increase production and reduce emissions.

There are currently only four AD projects on dairy farms. AD on larger farms is limited because the current manure management practice comprises open dumping with no manure collection. Household AD projects are more common in Ethiopia and there are currently 3,000 of these systems. Barriers to AD development include lack of knowledge, capacity, manure collection, funding, and available time to complete construction.

For the Statement of Purpose, Mr. Fikreyesus recommended the subcommittee should focus on AD and work with others on enteric fermentation.

India. Mr. Dhussa gave a presentation that noted India's AD from agricultural waste is receiving financial support from government programs at a higher level than other projects. India has 150,000 household AD systems and multiple large capacity AD systems (>250 kW). There is a need to develop medium-sized AD systems in India. Barriers to AD development in India include an evolving tariff structure for the sale of the generated electricity, industry's reluctance to adopt technology which is not highly profitable, and a lack of interest from developers in medium-sized projects.

Regarding the Statement of Purpose, Mr. Dhussa suggested the subcommittee should not focus on topics where no major progress can be made by organizations that are not research and development oriented. He also recommended the subcommittee might benefit from a name change to reflect the sector's focus on methane recovery. Elias Frieg of Mexico's National Water Commission (GMI Municipal Wastewater delegate) replied all GMI sectors focus on methane recovery so a more specific name would not be needed.

P.M.G. Pathiraja of Sri Lanka's National Engineering Research and Development Center (GMI MSW delegate) asked if India's AD systems include monitoring. Mr. Dhussa replied there is monitoring on some of the systems, but not all. He added that there has been an 80 percent success rate on AD systems built within the last 10 years.

Philippines. Emelita Dimapilis from the Philippine Council for Industry, Energy and Emerging Technology provided the Philippines' county update for the Philippines. Ms. Dimapilis noted GMI performed an RA and determined that swine farms, distilleries, coconut processing plants, and slaughterhouses had the largest potential for methane recovery projects. The Philippines Renewable Energy (RE) Law currently provides incentives encouraging methane recovery from livestock waste. There are currently four registered livestock projects under RE and more in the pipeline to be registered. There are 58 CDM registered projects in Philippines and 37 are livestock projects. The Philippines is developing the Philippine Methane Partnership, which will provide policy, technical, and planning support for solid waste management including livestock wastes.

Regarding the Statement of Purpose, Ms. Dimapilis explained enteric fermentation and rice cultivation would be new focus areas for the Philippines so they would like to review more research and information before committing to work in those areas.

Thailand. Arux Chaiyakul of the Thailand Department of Livestock Development gave a presentation noting the focus of Thailand's livestock waste management, which includes improved water quality as well as decreased emissions. Dr. Chaiyakul described the current Thai projects including a channel digester, a tubular digester, the zero waste project, and the carbon footprint initiative. Challenges to AD development in Thailand include financial barriers, maintenance issues, and the need for inexpensive hydrogen sulfide removal.

Dr. Chaiyakul noted the Statement of Purpose should state the subcommittee will promote new and innovative AD systems and exchange or transfer technologies among countries.

United States. Ms. Costa summarized the U.S. country update, explaining U.S. EPA's AgSTAR Program promotes and tracks U.S. AD systems. U.S. EPA also chairs a national workgroup that looks at the linkages between AD systems, organic materials, and municipal wastewater. In addition, U.S. EPA is actively involved in several international agriculture-related initiatives.

There are approximately 191 AD systems operating in the United States, a majority of which are plug flow digesters located on dairy farms. Currently, U.S. EPA is interested in: expanding the use of biogas for transportation, incorporating nutrient recovery into AD systems, streamlining the U.S. permit process for AD systems, and helping to develop innovative business models. Barriers to AD development include decreasing financial incentives, concerns about effluent quality from codigestion systems, and poorly developed byproduct markets.

Internationally, the United States has collaborated with The World Bank on projects in China, the Philippines, and Mexico. Future work may take place in Indonesia, Vietnam, and Thailand. The

United States also supported the development of Philippine tubular digester projects. These small-scale systems showed a 50 percent cost reduction compared to other small scale technologies (such as fixed and stacked domes).

Mr. Hilbert noted there were lofty goals for U.S. AD systems that he heard mentioned at the 2011AgSTAR meeting in Boise, Idaho. Ms. Costa explained the Innovation Center for U.S. Dairy set a goal to have 1,300 digesters by the year 2020. Currently, they are working with the U.S. Department of Agriculture (USDA) to develop a biogas roadmap and determine how they might achieve this goal, which is likely by monetizing byproducts and benefits. The American Biogas Council, which performs lobbying and education, is encouraging the U.S. Congress to recognize biogas for renewable energy initiatives.

Ms. Pathiraja asked if there were any U.S. systems accepting dry waste and if there was a technique to provide a continuous influent feed to the system. Ms. Costa explained the U.S. poultry industry has that problem, which is one reason why there are so few poultry AD systems. Mr. Dhussa noted there are some examples projects in India.

Discussion

Mr. Frieg noted most AD projects in Mexico that are generating emissions reductions are situated on swine farms. He explained the driver of those projects was CDM, which is no longer an incentive so he recommended these projects be promoted in a new way. Mr. Dellagnelo agreed there is little incentive for projects without CDM and he suggested the subcommittee should be concerned about the driving forces behind AD development, including regulations. Mr. Hilbert replied there are helpful policies being developed in some countries and increasing energy prices are accelerating projects. Mr. Dhussa added there are benefits to AD systems that make them attractive even without CDM. Mr. Frieg commented the price of carbon needs to improve to provide incentives for AD projects. Mr. Ferland replied GMI has not focused on the price of carbon and instead had looked to find common sense solutions, which can be sold for obvious reasons and not only for the price of carbon.

Mr. Dhussa asked Marlene Sieck of Germany's Federal Environment Agency (GMI MSW delegate) for an update on the status of AD in Germany. Ms. Sieck explained there are many successful AD projects in Germany, mostly because of favorable policies and incentives including feed-in tariffs. Mr. Hilbert noted the price paid for AD generated electricity is high in Germany, which further encourages AD projects.

Subcommittee Projects

Mr. Dhussa explained because the co-chairs would like to make the subcommittee more relevant and increase participation, they thought a subcommittee-assisted project would be beneficial. The projects would be a joint effort by the subcommittee delegates with some assistance from the ASG. Three suggested projects included on the agenda are:

- Guide to policies and incentives
- Case studies and success stories
- Promotion of projects

Mr. Hilbert noted he has been participating in the subcommittee since its inception and has seen the ups and downs of participation. There have been some good work products developed by the subcommittee, including the *International Guidance for Quantifying and Reporting the Performance of Anaerobic Digestion Systems for Livestock Manure*. He expressed his hope that

the subcommittee will participate and provide input on future projects. He reminded the meeting participants the subcommittee needs active and consistent participation to achieve successful projects.

Ms. Costa asked the meeting participants around the table to each provide input.

Mr. Fikreyesus suggested the subcommittee could develop an international best practices guide for AD technology. First, delegates could provide case studies and then policies. In addition, he suggested the subcommittee could consider better ways to facilitate information sharing. Mr. Fikreyesus offered to help lead the best practices guide development.

Emmanuel Asimeng of Ghana's Environmental Protection Agency (GMI Municipal Wastewater representative) suggested case studies would be a beneficial project. He added the subcommittee could be renamed to "Agricultural Wastewater", which would make it clear enteric fermentation and rice cultivation are not included.

Ms. Sieck stated Germany has ample experience with technical and policy issues, but she noted policies will not help if there is unwillingness by government to implement them. Therefore, looking at other countries' policies may not be beneficial.

Bryce Lloyd of OWT (PN member) noted a best practice guide is a good suggestion. He added understanding the types of systems that work best in certain situations would be even more beneficial. In addition, he explained the carbon market is volatile: therefore, putting the focus of GMI on the carbon market would be difficult. In Southeast Asia, AD projects are promoted mainly by feed-in tariffs.

Ms. Diana Velosa of Columbia's Ministry of the Environment and Sustainable Development (GMI MSW co-chair) stated a policy guide would be helpful. Mr. Hilbert noted this type of document could be shared with the Steering Committee and other subcommittees. Mr. Lloyd added it could be a policy case study document.

Miguel Franco of Tetratech (PN member) noted there is a lack of understanding in the financial sector so developing a guidance for financial institutions would advance project development. Mr. Ferland agreed and noted there is significant work occurring within different organizations with little collaboration. He added it would be beneficial to better understand how multi-lateral banks are working and if there might be a mechanism for them to coordinate their efforts. This would help everyone to better understand how to identify and use available resources.

Tom Frankiewicz of U.S. EPA (GMI MSW co-chair) noted there are several commonalities amongst the GMI sectors and Agriculture Subcommittee projects could help other subcommittees. The MSW Subcommittee developed the *International Best Practice Guide for Landfill Gas Energy Projects*, and this could be used as a framework if the Agriculture Subcommittee decides to develop a best practices guide.

Dr. Chaiyakul suggested the land application of treated waste to crops as a best practice case study in Thailand.

Ms. Pathiraja recommended the subcommittee develop guidance for small-scale systems to assist with technologies and provide techniques to reduce costs.

Ms. Dimpalis noted the subcommittee could perform assessments of different technologies available to determine which perform the best.

Cortney Itle of the GMI ASG noted many meeting participants suggested it would be helpful to know what types of systems are successfully operating in different countries and regions. She reminded meeting participants the ASG has developed the framework for an international AD database and all country delegates are encouraged to submit AD data to include in the database.

Mr. Frieg commented the subcommittee should have a quota of case studies that each country is required to deliver. He added country delegates should promote GMI within their own countries in addition to promoting their country within GMI.

Mr. Dhussa concluded that the subcommittee would focus on developing case studies to include in a best practices guide. He added the subcommittee is always open to suggestions for future work. Any additional suggestions may be submitted to the ASG or sent directly to the co-chairs.

Methane Expo 2013 Planning

Mr. Hilbert noted the Methane Expo 2013 has been discussed previously during the joint meeting: however, the agriculture sector was not discussed specifically. The co-chairs would like to obtain input from the meeting attendees on which topics to include in the Expo technical agricultural sessions. As discussed earlier, a summary of the current enteric fermentation work will be included.

Mr. Fikreyesus noted a session on Nationally Appropriate Mitigation Actions (NAMAs) would be beneficial. Mr. Frankiewicz agreed and stated this session would affect multiple sectors so it could be a cross-sector session. Mr. Ferland stated there could be cross-cutting sessions at the Expo if these topics were identified in advance and the timing was planned well.

Ms. Costa suggested the co-chairs would develop the topics/sessions to be included in the Expo. This list will be sent to the subcommittee for comment, then the co-chairs and ASG will work to select speakers to match the topics. Mr. Hilbert noted even delegates whom are not planning to attend Methane Expo 2013 should provide input on the topics.

Closing

Ms. Costa reminded the meeting participants there will be a webinar in November 2012 to discuss the subcommittee activities and Methane Expo 2013.

Mr. Ferland announced the ASG will be sending a template for the collection of success stories to share at the Expo. In addition, he encouraged participants to submit abstracts to present at the Expo.

Mr. Hilbert announced he will be resigning from his co-chair position and therefore, would like to hear from any delegates that would be interested in becoming an Agriculture Subcommittee Co-Chair.

The co-chairs thanked the meeting participants for their input and adjourned the meeting.

Summary and Review of Action Items

The action items discussed at the meeting include the following:

The ASG and co-chairs will:

- Send the Statement of Purpose out to the subcommittee for additional comment
- Obtain updates on enteric fermentation to share with the subcommittee at Methane Expo 2013
- Schedule an internet/telephone meeting for November 2012
- Review abstracts and develop agendas for Methane Expo 2013
- Develop a timeline for international best practice guide case studies

Country delegates will:

- Provide input on the draft Statement of Purpose
- Provide suggestions for technical session topics for Methane Expo 2013
- Provide any suggestions for future work to the ASG (at asg@globalmethane.org) or co-chairs
- Submit abstracts and success stories for inclusion in Methane Expo 2013

Provide input to the international database via template available on the website (at http://www.globalmethane.org/news-events/event_detailsByEventId.aspx?eventId=341)

Annex 1: Global Methane Initiative Agriculture, Municipal Solid Waste and Wastewater Subcommittee Meetings Agenda

Monday – 2 July 2012	
8:30 – 9:00	Registration
9:00 – 10:00	Plenary and Cross-Sector Session • Welcome from Singapore Hosts • ASG Update • Methane Expo 2013 Planning • Update on Country Action Plans (Cross-Sector)
10:00 – 10:15	Break
10:15 – 12:00	Municipal Solid Waste Subcommittee Meeting
12:00 – 13:00	Lunch
13:00 – 15:15	Municipal Solid Waste Subcommittee Meeting, continued
15:15 – 15:30	Break
15:30 – 17:30	Wastewater Subcommittee Meeting
Tuesday – 3 July 2012	
08:30 – 09:00	Registration
09:00 – 10:00	Cross-Sector Session • Update on Climate and Clean Air Coalition (CCAC)
10:00 – 10:15	Break
10:15 – 12:15	Wastewater Subcommittee Meeting, continued
12:15 – 13:15	Lunch
13:15 – 15:45	Agriculture Subcommittee Meeting
15:45 – 16:00	Break
16:00 – 17:45	Agriculture Subcommittee Meeting, continued

Municipal Solid Waste Subcommittee Meeting Agenda

Marina Bay Sands Hotel
Singapore

Monday, 2 July 2012

10:15 – 10:20 **Welcome and Brief Introductions**
Guah Eng Hok Waste Management & Recycling Association of Singapore, Tom Frankiewicz and Sandra Lopez Co-chairs
- Agenda overview
- Meeting goals

10:20 – 11:00 **Subcommittee Business**
Co-chairs
- Volunteers for Co-Chair
- New Mission Statement, Action Plan
- International Best Practices Guide

11:00 – 12:00 **Methane Action Plans**
Partner Country Delegates
- Updates from each Partner Country on status, gaps, and strategy

12:00 – 13:00 **Break/Lunch**

13:00 – 15:00 **NAMAs Roundtable**
Co-chairs
- Summary and status of NAMAs in Solid Waste Sector – Tom Frankiewicz
- MSW as a Forum for NAMA Development: Examples from Colombia – Sandra Lopez
- Partners Roundtable Discussion – Partner Countries provide an update on their NAMA activities
- Discussion, outline of GMI support, and tools needed to advance NAMA development in Partner Countries

15:00 – 15:15 **Summary and Review of Action Items**

15:15 – 15:30 **Break/Transition to Wastewater Subcommittee**

Municipal Wastewater Subcommittee Meeting Agenda

Marina Bay Sands Hotel
Singapore

Monday, 2 July 2012

15:30 – 15:45	**Welcome and Brief Introductions** • Review of meeting goals • Brief overview of those participating • Adopt agenda
15:45 – 16:00	**Summary of 18 April 2012 Internet-Based Meeting and Action Items**
16:00-16:15	**Municipal Wastewater Subcommittee Membership and Leadership** • Subcommittee delegates • Decision on co-chairs • Recruitment of Project Network members
16:15-17:30	**Country Updates** • Status of wastewater activities • Barriers/needs
17:30	**Adjourn**

Tuesday, 3 July 2012

10:15 – 11:15	**Municipal Wastewater Subcommittee Action Plan** • Review of updated draft and adoption • Discuss development of whitepaper assessing methane emissions reduction opportunities
11:15-12:00	**Methane Expo 2013** • Discussion of agenda topics, tour sites, and exhibiting
12:00-12:15	**Outcomes and Next Steps**
12:15-13:15	**Break for Lunch/Transition to Agriculture Subcommittee**

Agriculture Subcommittee Meeting Agenda

Marina Bay Sands Hotel
Singapore

Tuesday, 3 July 2012

13:15 – 13:30 **Welcome and Brief Introductions**
Allison Costa, Anil Dhussa and Jorge Hilbert, Co-chairs
- Agenda overview
- Meeting goals

13:30 – 15:00 **Brief Country Updates (5-10 minutes for each country)**
Country delegates

15:00 – 15:45 **Statement of Purpose**
Allison Costa, Co-chair
- Results from Agriculture Subcommittee survey
- Review and comment on Statement of Purpose

15:45 – 16:00 **Break**

16:00 – 17:00 **Subcommittee Projects**
Anil Dhussa, Co-chair
- Discussion and selection of projects:
  - Guide to policies and incentives that promote AD around the world
  - Compilation of case studies and success stories
  - Promotion of projects that need financing or development
- For each project, subcommittee should decide:
  - Format of final products
  - Timeline for project
  - Person(s) to lead effort

17:00 – 17:30 **Methane Expo 2013 Planning**
Jorge Hilbert, Co-chair
- Discussion of topics to include in technical and policy sessions

17:30 – 17:45 **Summary and Review of Action Items**

Annex 2: Participants

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