

## Subcommittee on Environment and Energy | MINUTES

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**Meeting date & time** *March 17-18, 2015*

**Meeting location** *ACI-NA, Washington D.C.*

<b>Purpose</b>	E&E Subcommittee Guidance & Review for FY 2017 R&D Budget
<b>Facilitator</b>	Jim Hileman, DFO
<b>Note taker</b>	Jim Hileman
<b>Timekeeper</b>	Jim Hileman

### Minutes from Meeting

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**Presentation** *Chair Opening Statements* | **Presenter** *Mahendra Joshi*

**Discussion:** Mahendra walked through the administrator's response to the recommendations from the full REDAC and noted that Dennis Filler will be joining us later in the morning.

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**Presentation** *What's New in AEE* | **Presenter** *Lourdes Maurice*

**Discussion:** We have had staff turnover since the last meeting in August. Stephen Merlin has replaced Pat Moran as our Air Traffic Control specialist working in the Policy and Operations division. Adrienne Vanek has replaced Minh Favila as an international specialist within the Policy and Operations division. Mohammed Majeed has joined the Emissions Division and will be working on emissions modeling. We currently have a position open in the Noise Division. Don Scata is our acting. We are in the process of interviewing for the Senior International Advisor. Don Scata has been acting in this position. Kevin Welsh is on detail to the White House. Chris Sequeira has moved on to ATO so we have a position open in the Emissions Division.

Our number issue continues to be noise.

We have been very busy handling challenges from helicopter noise. The North Shore of NYC and LA are still the primary areas of interest. We are still working to ensure that R&D is driving our decision making. We have stood up several projects to work on helicopter noise.

This summer we expect a ruling on advanced proposal of rulemaking in regards to CO2 emissions. We are working closely with EPA on this.

Our current authorization expires in Autumn and we are currently working on the next reauthorization. In the event of a lapse, the staff who are funded by RE&D will be furloughed. During a government shutdown, staff who are funded by operations funding are furloughed. In regards to environment, we are interested in having FAA leadership of the global market based measure. We are also examining how to promote alternative jet fuel use.

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**Presentation CAEP Update | Presenter Lourdes Maurice**

**Discussion:** We have three items to cover: CO2 standard, global Market Based Measure, and a PM standard.

We have been working on CO2 standard since it was first brought up in 2008. We expect that CAEP will make a decision on the CO2 standard in February 2016. R&D has been instrumental in making this happen. We still need to do cost benefit analysis such that we can make a data driven decision. This is a new standard so we have much work to do on implementation.

We are working on a global market based measure for international aviation. There will be a presentation on our efforts this afternoon. There is much work to do and larger climate issues could complicate issues. As such, there are considerable discussions at varied levels including ICAO Counsel, CAEP, and CAEP working groups. The CAEP work should finish in February 2016 such that there will be a proposal presented to ICAO Counsel in 2016.

We continue to work on a PM standard. This is actually more complicated than a CO2 standard as we are also developing a measurement methodology and assembling the data from these data.

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**Presentation Responses to REDAC Recommendations & Actions | Presenter Jim Hileman**

**Discussion:** Jim walked through the existing findings and recommendations. The FAA responses will be presented at the next REDAC meeting in August.

Jim walked through the actions that have been completed and those that are remain open.

There was much discussion about Noise Aeronautics R&D Plan with Subcommittee members expressing interest in updating the document.

The Subcommittee reiterated that they would really like to have EPA at the next REDAC meeting to discuss recent updates in regards to CO2 standard and proposed rulemaking.

<b>Action items (from previous meetings)</b>	<b>Person responsible</b>	<b>Deadline</b>
Create ASCENT fact sheet for sharing with community	Jim Hileman	August 2015
Improve search criteria for AEE websites	Jim Hileman	August 2015
Pursue environment.faa.gov and faa.gov/environment as potential aliases for FAA environment research	Jim Hileman	August 2015
Provide Subcommittee with more specifics on the Emissions Roadmap at Summer 2016 meeting	Ralph Iovinelli	August 2015
Invite EPA to come to the meeting to talk about what they are doing regarding the endangerment finding on CO2 and how it relates to the forthcoming CO2 standard	Jim Hileman	August 2015
Leverage the roadmapping efforts at NASA and FAA to update the White House National R&D Plan	Jim Hileman	August 2015

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**Presentation Budget Update | Presenter Mike Gallivan**

**Discussion:** Mike presented budget details on budget for FY15 and FY16.

FY15 budget was enacted in December. Mike walked through how RE&D funds were actually enacted noting how increases in E&E funding was accompanied by reductions elsewhere.

FY16 RE&D budget includes \$38.8M of RE&D for environment and energy. The base funding has been increased. F&E funding continues to decrease in FY16 with \$1M for environment and energy. The FY16 budget was submitted on time to Congress. Expect that sequestration and policy riders will be issues in FY16.

FY17 RE&D target is \$169M. Expect OST passback in late July or early August, OMB passback in early December and will submit FY17 President budget to Congress in February 2016.

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**Presentation REDAC R&D Prioritization Exercise Outcomes | Presenter Dennis Filler**

**Discussion:** Dennis discussed the R&D prioritization exercise that was conducted during the last REDAC meeting. There was a variety of feedback on the process.

As a result of this and other efforts, commercial space has a budget line item and unmanned aerial systems R&D is getting more funding. The exercise also identified cyber security as an area of need.

There was a robust discussion about the effort, how it went and the direction it could take the FAA in its future R&D efforts.

Lessons learned from this effort will be used should the FAA decide to repeat this effort.

It is unlikely that this particular effort will be repeated in August, but there could be some other assignment given to assist the agency.

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**Presentation FY17 Program Proposal (including COE Update) | Presenter Jim Hileman**

**Discussion:** Jim gave an overview of the Environment and Energy Research to refresh the Subcommittee on the research objectives. He also presented on the historical budget levels as well as the FY15 enacted budget, the FY16 Presidential budget, and the FY17 target. The budget section gave a breakout of the funding by research topic. The briefing included a discussion on the ASCENT COE and CLEEN programs. The Subcommittee expressed concerns about the large reductions in funding and its impacts on AEE research.

There was a discussion around the new COE with the Subcommittee complimenting AEE on the smooth transition from PARTNER to ASCENT. The Subcommittee was invited to attend the coming ASCENT COE meeting that will be held in Seattle Washington during Oct 13-15. The subcommittee noted that the format of the alt jet fuels day of the recent ASCENT meeting was good, and that AEE could consider using that format throughout. However, AEE should be cognizant of the information overload if the information density is too high.

There was much discussion about what was cut to meet the current budget levels and how AEE is leveraging the budget and efforts from other organizations.

Action items	Person responsible	Deadline
Present budget provided by other entities (full budget not just RE&D and F&E) that are supporting the noise work of AEE. The question arose due to the fact that AEE are leveraging noise efforts elsewhere.	J. Hileman & R. Cointin	August 2015

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**Presentation Emissions Research - Roadmap and Update | Presenter Ralph Iovinelli**

**Discussion:** Ralph presented on efforts to relating to the emissions research roadmap. He walked through areas of research in AEE. He presented on FY15 research efforts and plans for FY16/17. The Subcommittee wants to know what will be completed in the roadmap and when it will be completed in the out years.

Action items	Person responsible	Deadline
Include timeline for when projects will be completed within the Emissions Roadmap	Ralph Iovinelli	August 2015

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**Presentation PM Measurement and Standard Development | Presenter Daniel Jacob**

**Discussion:** Daniel presented on the ongoing efforts to develop a PM measurement system for gas turbine engines and a standard within ICAO CAEP. He presented progress toward the development of a PM measurement system and the issues that still must be overcome. There was a discussion within the Subcommittee on the relative health impacts of primary and secondary particulate matter. Daniel then discussed how an all-pass PM standard could replace the current smoke number standard through the acquisition of PM data from the current fleet of gas turbine engines.

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**Presentation Update on the CO2 Standard | Presenter Laszlo Windhoffer**

**Discussion:** Laszlo presented an overview of the work that we are doing to develop a CO2 standard within ICAO CAEP. He showed how we have been working on this for a long time and how close we are to completion. Laszlo walked through the milestones that have been completed to date. Laszlo provided additional information on the range of in-production applicability options that are being considered. He presented what are the next steps that need to be addressed up to the CAEP/10 meeting in February 2016 as well as the efforts that will follow to ensure implementation.

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**Presentation Aircraft Tech – CLEEN Update and CLEEN II Status | Presenter Levent Ileri**

**Discussion** – Levent presented update of progress in maturing technologies within the CLEEN program. He discussed where the projects fall in terms of their Entry into Service (EIS) dates.

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**Presentation** *Alternative Jet Fuel - Overview of Activities* | **Presenter** *Nate Brown*

**Discussion:** Nate gave an update on the overall research efforts on alternative jet fuels. He started by outlining the FAA vision regarding alternative jet fuels. He then went through a high level overview of the work we do on alternative fuels testing, analysis and coordination. He noted the successful coordination of the recent CAAFI R&D team meeting with the ASCENT COE meeting. He finished with a discussion on what our focus is for FY15.

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**Presentation** *Alternative Jet Fuels Supply Chain Project* | **Presenter** *Jim Hileman*

**Discussion:** Jim walked through the alternative jet fuel supply chain project. He presented the objectives of the work and the various universities and national labs that are involved in the work effort. He presented each of the key work elements of data generation, scenario development and sustainability evaluation. He discussed the connection of the work to the Alternative Fuel Task Force of ICAO CAEP. He said that the work scope has been decreased due to the reduced funding that is available.

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**Presentation** *National Alternative Jet Fuel Strategy - Update* | **Presenter** *Mohan Gupta*

**Discussion:** Mohan presented progress in the development of a national alternative jet fuel R&D strategy that is providing the coordinated R&D plan for the U.S. Federal Government. The interagency group is currently addressing comments received from the stakeholders. The next steps are to conduct another round of review and then to secure the review and approval from ASTS and CoT/NSTC for Strategy release. Mohan pointed out that other agencies are looking to use this strategy to aid their business case.

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**Presentation** *National Jet Fuel Combustion Program - Update* | **Presenter** *Mohan Gupta*

**Discussion:** Mohan walked through the overall program in terms of how it fits into the existing ASTM Certification/Qualification program, other benefits from the program, the technical work that would be done, and the figures of merit. Mohan described the programmatic elements of the work including how it will be done collaboratively by government, industry and academia.

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**Presentation** *R&D Efforts to support a Global Market Based Measure* | **Presenter** *Dan Williams*

**Discussion:** Dan discussed the basket of measures wherein ICAO hopes to meet its aspirational goals for carbon neutral growth after 2020. He discussed the history of the global market based measure (GMBM) for international CO2 emissions within ICAO CAEP. He presented the parts of ICAO and their interconnectivity in regards to the GMBM. There was a discussion about the various options that could be used for a GMBM.

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**Presentation** *Industry Perspective* | **Presenter** *Steve Alterman*

**Discussion:** Noise is the big aviation environmental issue for the current Congress.

FAA needs to either be reauthorized this year or to have an extension. People are talking about restructuring the agency and not just reauthorizing. Nobody is clear though how this would be done. One way of doing this is to remove ATO and make it an independent entity that has stable funding and a board of directors. Another option is to move the entire agency to an independent agency. NavCanada as well as Australia and Europe are potential models for how this could be done. There is uncertainty though on how research moves and it is unclear that anyone is considering research aspects. The FAA does not have a position on this as yet. This will play out over next few months.

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**Presentation Noise Research Update | Presenter *Rebecca Cointin***

**Discussion:** Becky presented research being done within updated the noise research roadmap and progress that has occurred in the national noise survey. The Subcommittee noted their strong support of the roadmap and the fact that they are grateful for the approach being taken in the development of the survey.

The Subcommittee asked how the FAA came to its goal of 300,000 people being exposed to DNL 65 by 2018 and it was explained that this was based on historical trend. The subcommittee requested that AEE present the progress in noise reduction over the past 10-15 years.

The Subcommittee was very supportive of the new format for the noise research roadmap. The Subcommittee was also supportive of the new format for the noise meeting that followed the recently completed ASCENT COE meeting.

There was discussion on noise health impacts research and the direction of the research. AEE pointed out that they do not intend to fund a full-fledged field study on the health impacts of noise but instead would work with other federal agencies that have epidemiological expertise. The Subcommittee noted that AEE does indeed need to examine the health impacts of noise as it would provide scientific understanding of the environmental impacts of aviation. If AEE wants additional oversight of this work, it could set up a government panel to monitor the research.

A Subcommittee member noted that the Commercial Space COE is preparing to examine launch noise.

The noise discussion transitioned directly to the PBN discussion.

<b>Action items</b>	<b>Person responsible</b>	<b>Deadline</b>
Present historical data on noise exposure – go back at least 10-15 years	R. Cointin	August 2015

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**PBN - Discussion on Rollouts**

**Discussion:** Joshua Gustin (PBN Group Manager at ATO) and Chris Sequeira (recently joined ATO to work on outreach efforts) joined the meeting from ATO. They led a discussion on PBN and the challenges that noise has presented in terms of the rollout of these new procedures.

The group discussed the successes and challenges that the FAA is having with PBN rollouts and how community noise factors into this. Josh described the process to develop metroplex procedures. The overall process takes a little over 3 years starting from the scoping study

through to procedure implementation. ATO Environmental specialists are engaged throughout the process, from analysis of study team notional designs and environmental review of design packages. The actual environmental review begins along with the design team and lays groundwork for the 12-18 month Environmental Assessment (EA) process. This process ends with the completion of the evaluation phase and the delivery of a record of decision (ROD) for the EA. From there the Metroplex effort goes into the implementation phase. Analogies were drawn to the single-site PBN development process, which has a similar structure. The Subcommittee discussed the need to ensure that environmental modeling is well integrated into metroplex and single-site PBN development and how it could be incorporated at an earlier stage. The Subcommittee also discussed the potential opportunities for ATO and AEE to work together on this issue. This is very interesting.

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**Presentation Operations Research - Roadmap and Update | Presenter *Chris Dorbian***

**Discussion:** Chris presented the operations research roadmap with a focus on ongoing efforts and our plans for FY15 through FY17 if funding were not an issue. He presented plans and results from AEE efforts on Cruise Altitude and Speed Optimization, Delayed Deceleration Approaches, Surface Congestion Management, and Continuous Climb Operations. He also discussed plans to examine UAS in FY15 as well as to stand up new work to explore steeper approaches.

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**Presentation Modeling & Tools Update | Presenter *Jim Hileman***

**Discussion:** Jim presented the broad outlines of why we are developing tools and how we are using this thinking to develop a tools and analysis roadmap. He noted that FAA are in the very initial stages of developing this roadmap.

Chris presented the Goals Analysis and the plans to evaluate noise and better incorporate our overall research program efforts into the analysis.

A Subcommittee member noted that the use of CO2 equivalent in the climate chart leads to confusion and it would be better to stick with just CO2. They also recommended that what is included in the non-combustion aspect be improved to note that it is associated with the feedstock production and conversion to a finished jet fuel.

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**Presentation NASA Update | Presenter *John Cavolowsky***

**Discussion:** John noted that he is well aware on all of the FAA REDAC work as he is involved in all of the FAA REDAC Subcommittees. He expressed a concern about the lack of communications within the FAA and that there is an opportunity to improve FAA's communication during the early stages of the development of new operational procedures.

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**General Discussion | Lead *Mahendra Joshi***

General observations:

- There has been much progress and the program is more organized than ever. As budget decreases, tough decisions will need to be made. Appropriate choices are being made in terms of budget cuts. The prioritization of the program is logical.
- Presentations were well done and useful. The work is high quality. Scope of information in the briefings is very good. AEE are covering a broad spectrum of research.
- The Subcommittee is pleased to see what is happening as AEE are very responsive to requests from the Subcommittee.
- Noise is definitely a priority and a current need, but research needs to progress on all fronts.
- Good to see the work on the Global Market Based Measure as this is an important part of the basket of measures to address CO2 emissions
- Pleased that funds were brought forward to do Particulate Matter measurements.
- A subcommittee member asked that AEE maintain and update their environment goals and to please provide them numerically wherever possible.

#### Discussion on Findings and Recommendations:

- Noise continues to be problem #1 and is manifest in various ways (helicopters, PBN implementation, etc.). The agency should continue to follow data-driven decision making. The Subcommittee would like to see AEE and ATO working collaboratively on noise issues regarding PBN. AEE should continue to examine supplemental metrics to examine the community reaction to noise. A subcommittee member suggested bringing different resources to help better understand noise issues. For example, social scientists and psychologists could bring a different skill set to the problem.
- The Subcommittee supports the above target for the CLEEN Program and alternative jet fuels. A member noted that the above target could be used to ensure that the momentum of the NJFCP is preserved.
- Funding reductions are having a negative impact on the development of new operational procedures and AEDT.
- The Subcommittee is pleased with the smooth transition from PARTNER to ASCENT. The Subcommittee also noted that ASCENT programs are well aligned with FAA goals.
- The CLEEN program is progressing well and the Subcommittee commends the FAA for continuing the program. The agency should make CLEEN progress available on the web.

#### **Subcommittee Discussion of Open Recommendations** (Discuss status of FAA response and decide to close or remain open)

*All of the recommendations from the August 2014 meetings remain open.*

#### **Next Meeting – Date/Location/Agenda Items to be Included**

*August 6-7 in Washington DC*

**Adjourned at 3:00 pm on Wednesday, March 18, 2015**

**REDAC**  
**Subcommittee on Environment & Energy**  
**Winter/Spring 2015**  
**March 17-18, 2015**

**Day 1 - MARCH 17, 2015**

**In Attendance**

John A. Cavolowsky, NASA  
Curtis Holsclaw, FAA  
Dennis Filler, FAA  
Daniel Jacob, FAA  
N. Chumley, ACI-NA  
Nate Brown, FAA  
Dan Williams, FAA  
Laszlo Windhoffer, FAA  
Chinita Roundtree-Coleman, FAA  
Mahendra Joshi, BOEING  
Jim Hileman, FAA  
Mohan Gupta, FAA  
Levent Ileri, FAA  
Charles Etter, Gulfstream  
Joe Zelina, GE Aviation  
Dimitri Mavris, Georgia Tech  
Lourdis Maurice, FAA  
Ian A. Redhead, MCI  
Gregg G. Fleming, U.S. DOT/VOLPE  
Ralph Iovinelli, FAA  
Don Scata, FAA  
Julie Marks, FAA  
Rebecca Cointin, FAA  
Stephen Merlin, FAA  
Juan Alonso, Stanford Uni.  
Mike Gallivan, FAA  
Alex Menotti, AYA  
Katherine Preston, ACI-NA

**REDAC**  
**Subcommittee on Environment & Energy**  
**Winter/Spring 2015**  
**March 17-18, 2015**

**Day 2 - MARCH 18, 2015**

**In Attendance**

Charles Etter, Gulfstream  
Joshua Gustin, FAA  
Mohan Gupti, FAA  
Katherine Preston, ACI-NA  
John Cavolowsky, NASA  
Stephen Merlin, FAA  
Rebecca Cointin, FAA  
Juan Alonso, Stanford Uni.  
Chris Dorbian, FAA  
Alex Menotti, AYA  
Mahendra Joshi, BOEING  
Jim Hileman, FAA  
Steve Altevin, CAA  
Chris Sequeira, FAA  
Steven Hamburg, EDF  
Ian A. Redhead, MCI  
Gregg G. Fleming, USDOT/VOLPE  
Curtis Holsclaw, FAA  
Dimitri Mavris, Georgia Tech  
Joe Zelina, GE  
Lourdes Maurice, FAA  
Chinita Roundtree-Coleman, FAA

**FAA REDAC Subcommittee on Environment and Energy  
Spring 2015 Meeting Agenda  
Airports Council International - North America  
1615 L St. NW., Suite 300 Washington, DC 20036**

**Remote Participation:**

Conference call numbers: 1-415-655-0002 U.S.  
1-416-915-8942 Canada

Audio-only Participant Passcode: 460 358 81

Webinar address: <https://aci-na.webex.com/meet/kpreston>  
Webinar Access Code: 645 410 842

**Read Ahead Materials:** <http://redacdb.faa.gov/browse.cfm>

**Tuesday, March 17, 2015**

<b>Time</b>	<b>Duration</b>	<b>Title</b>	<b>Presenter</b>
8:00	0:30	Check-In / Continental Breakfast	
8:30	0:05	Welcome	
8:35	0:10	Chair opening statement & Introductions	M. Joshi
8:45	0:15	What's new in FAA & AEE	L. Maurice
9:00	0:15	CAEP Update	L. Maurice
9:15	0:15	Responses to REDAC Recommendations & Actions	J. Hileman
9:30	0:30	FY15/FY16 Budget Update	M. Gallivan
10:00	0:15	Break	
10:15	0:15	REDAC R&D Prioritization Exercise Outcomes	D. Filler
10:30	0:15	Discussion	
10:45	0:30	FY17 Program Proposal (including COE Update)	J. Hileman
11:15	0:30	Discussion	
11:45	0:15	Emissions Research - Roadmap and Update	R. Iovinelli
12:00	1:00	Lunch	
13:00	0:30	PM Measurement and Standard Development	D. Jacob
13:30	0:15	Update on the CO2 Standard	L. Windhoffer
13:45	0:15	Discussion	
14:00	0:30	Aircraft Technology - CLEEN Update & CLEEN II Status	L. Ileri
14:30	0:15	Discussion	
14:45	0:15	Break	
15:00	0:15	Alternative Jet Fuel - Overview of Activities	N. Brown
15:15	0:20	Alternative Jet Fuels Supply Chain Project	J. Hileman
15:35	0:20	National Jet Fuel Combustion Program - Update	M. Gupta
15:55	0:20	National Alternative Jet Fuel Strategy - Update	M. Gupta
16:15	0:15	Discussion	
16:30	0:30	R&D Efforts to support a Global Market Based Measure	D. Williams
17:00		End of Day-1	

**Wednesday, March 18, 2015**

8:00	0:30	Continental Breakfast	
8:30	0:15	Industry Perspective	S. Alterman
8:45	0:45	Noise Research - Roadmap and Update	R. Cointin
9:30	0:15	Discussion	
9:45	0:30	PBN - Discussion on Rollouts	All
10:15	0:15	Break	
10:30	0:30	Operations Research - Roadmap and Update	C. Dorbian
11:00	0:15	Discussion	
11:15	0:30	Modeling & Tools Update (incl. Goals Analysis & Metrics Development)	J. Hileman
11:45	0:15	Discussion	
12:00	0:15	NASA Update	J. Cavolowsky
12:15	0:45	Lunch	
13:00	1:30	Discussion	
14:30	0:30	Summary of Action Items and Findings & Recommendations	
15:00		End of Day-2	