



1791 Tullie Circle, N.E./Atlanta, GA 30329
404-636-8400
TC/TG/MTG/TRG MINUTES COVER SHEET

(Minutes of all Meetings are to be distributed to all persons listed below within 60 days following the meeting.)

TC/TG/MTG/TRG No. 6.7 DATE Jan 15, 2019

TC/TG/MTG/TRG TITLE Solar Energy Utilization

DATE OF MEETING Jan 26, 2016 LOCATION Orlando, FL

VOTING MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Maria Todorovic	2016			Tim Merrigan
Costas Balaras	2016			
Jim Leidel	2016			
Svein Morner	2016			
Khalid Nagidi	2016			
Janice Means	2014			
(estimate of attendees – roster not preserved)				

DISTRIBUTION: All Members of TC/TG/MTG/TRG plus the following:

TAC Section Head: Mark Hegberg	SH6@ashrae.net
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)	Mr. Cyrus H Nasser (Standards) cyrus.nasser@ee.doe.gov Mr. Harvey M Sachs (Research) hsachs@aceee.org Mrs. M Maggie Moninski (CCTC) maggie.moninski@gmail.com Mr. Lynn F Werman (2019 HVAC APPLICATIONS) lynnwerman@yahoo.com Mr. Nicolas Lemire (2020 HB Systems & Equipment) nlemire@pageaumorel.com
Mike Vaughn, Manager Of Research & Technical Services	MORTS@ashrae.net

DRAFT MEETING MINUTES
ASHRAE TC 6.7 – SOLAR ENERGY UTILIZATION
Winter Meeting – Jan 26, 2016
Orlando, FL, USA

NOTE: These draft minutes have been reconstructed after the fact, as minutes were not completed immediately after the committee meeting. The primary intent of creating these at this point in time is to document that a meeting did occur and such events as members that were present at the 2016 winter meeting recall.

1. TC Seminar: A Technical Seminar was held from 1 pm to 2:30 pm as part of the technical committee meeting. See attached draft agenda for a list of the topics to be presented.
2. Call to Order: The meeting was called to order by Chair Marija Todorovic at approximately 2:30 pm, January 26th, 2016 and introductions were made.
3. Code of Ethics: Chair read from the ASHRAE code of ethics.
4. Quorum: No official record exists that there was a quorum, although members at the summer meeting in St. Louis on June 28th, recall that a quorum was present. However, the point is moot as no records of votes survive.
5. Minutes: Review and approve the Atlanta draft minutes: No record exists of approval of the draft minutes for the Atlanta Summer meeting of 2015. The draft minutes for Atlanta 2015 could not be found on the TC web site.
6. Chair's report: The chair reviewed the roster and discussed sessions to be offered at the Orlando meeting. Chair shared information from the Chairs' breakfast meeting.
7. Subcommittee reports:
 - 7.1 Handbook – C. Balaras – See attachments.
 - 7.2 Research – J. Leidel – No record
 - 7.3 Standards – S. Morner – No record
 - 7.4 Program – Khalid Nagidi – See attachments
 - 7.5 Website – S. Morner – No record
8. Old Business – No record.
9. New Business – No record.
10. Adjournment – It is presumed that the meeting was adjourned at approximately 3:30 pm.

Respectfully submitted,

Mike Case, TC 6.7 Secretary



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American Society of Heating Refrigerating and Air-Conditioning Engineers Inc.

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AGENDA
ASHRAE Annual Meeting, Orlando, Florida

6.7 Solar Energy Utilization

1:00 - 3:30 pm, Tuesday, Jan 26, 2016

Orange F, Hilton

PART ONE: 1:00 PM – 2:30 PM

TC SEMINAR

SEMINAR TC (ADVANCED): Building Integrated PV (BIPV) Standardization is an International and Global Need

Track: Standards, Guidelines and Codes

Chair: Dr. Marija S. Todorovic, P.Eng., University of Belgrade, Belgrade, Serbia

Overview: Within the Standard Track, Forum is to discuss BIPV internationally as matured Cutting-edge technology with an aim to determine relevant tasks and working plan for preparation of an International BIPV Standard globally acceptable concerning BIPV technologies technical requirements of both buildings construction industries and of the electronics industries. It is to be developed as scientifically-technically sound document with all relevant data and measuring-technical specifications necessary for globally reliable BIPV design, construction, testing/commissioning and operation. Beside significant growth of constructed BIPV-buildings, collected performance data and PV industry and market growth, there is no BIPV international Standard. ASHRAE TC's encompass all relevant fields and could have crucial role in international BIPV standardization.

Co-Sponsoring Committees: 7.1 Integrated Building Design, 7.4 Exergy Analysis for Sustainable Buildings, 4.1 Load Calculation Data & Procedures and 1.9. Electric Systems

Presentations:

1. Singapore and Swiss BIPV Case Studies and Visual Standards, Presenter: Prof. Dr. Stephen Wittkopf, Lucerne University of Applied Sciences and Arts (HSLU), Switzerland.
2. Comparative Evaluation of Energy and Exergy Efficiencies of BIPV Systems, Presenter: Dr. Şiir & Prof. Birol Kilkis, Scientific and Technological Research Council of Turkey & Baskent University, Ankara, Turkey.

3. FLEXLAB testbed measurement of the energy and daylighting performance of glazing-integrated BIPV façade. Dr. D. Charlie Curcija, Lawrence Berkeley National Lab, United States.
4. BIPV Technical Standards – Developments within the European Union/Switzerland, Presenter: Dr. Francesco Frontini, University of Applied Sciences and Arts of Southern Switzerland (SUPSI).

Discussion and Conclusions

PART TWO: 2:30 PM - 3:30
TC 6.7 COMMITTEE MEETING

- I. Welcome**
- II. Call to order/Quorum/Introductions/Code of Ethics Statement**
- III. Agenda Review**
- IV. Minutes –Review and approve the ATLANTA Meeting minutes, conducted on June 30, 2015.**
- V. Chair’s Report – M. S. Todorovic**
 - A. Roster Comments - Any updates for contact information?
 - B. TC 6.7 Sponsored Sessions
 - a. **Seminar 38 (Intermediate):** Cooling with the Sun: Solar PV Cooling. Tuesday, January 26, 8:00 AM-9:30 AM, Orange Ballroom B, Hilton.
 - b. **Seminar 49 (Advanced):** Cooling with the Sun: Solar Thermal Cooling. Tuesday, January 26, 11:15 AM-12:45 PM, Orange Ballroom E, Hilton.
 - c. **Seminar 50 (Intermediate):** Double Skin Facade Design and Application. Tuesday, January 26, 11:15 AM-12:45 PM, Orange Ballroom D, Hilton.
 - C. Information from Chairs’ Breakfast Meeting
 - D. Announcements
- VI. Subcommittee Reports**
 - Handbook – C. Balaras
 - Research – J. Leidel
 - Standards –S. Morner
 - Program – Khalid Nagidi
 - Website – S. Morner
- VII. New Business Adjourn**



**ASHRAE Winter
Meeting, Orlando
DRAFT MINUTES**

**TC 6.7 Solar Energy Utilization HANDBOOK
Subcommittee**

Monday January 25, 2016
6:30 pm – 8:30 pm Lake Down A (L)

1. Call to order
2. Introductions
Costas Balaras (NOA)
Janice Means (Lawrence Tech Univ)
Svein Morner (Sustainable Engineering)
Khalid Nagidi (EMC Group)
Christian Vachon (Vachon solar)
Didier Thevenard (Canadian Solar) TC 4.2 Jim Leidel (Oakland Univ)
3. Approve minutes from Atlanta
4. Old Business
- A. **Ch 37 "Solar Energy Equipment" 2016 HVAC Systems & Equipment** (Balaras)
 - ✓ **Revised chapter approved in Chicago was submitted to HQs on Feb 26, 2015**
 - Pending:
 - Review of Proofs (Balaras to handle once received from HQs)
- B. **Ch A35 "Solar Energy Use" 2015 HVAC Applications** (Balaras)
 - ✓ **Published**
 - **Future work** (electronic version or next round edition)
 - AI-1: Costas Balaras will announce the new online review process that will be coming up for HB chapters in Spring 2016. New material should follow the existing format, terminology etc. All interested should start thinking of comments/edits to existing material and new input.**
 - i) *Review chapter and identify sections/topics that need changes, updates (ALL)*
No input yet
 - ii) *Add a new section on "Heat Pump Assisted Multipurpose Solar"*
(Todorovic)
No input yet
 - iii) *(old) Fig 21 and the cold water supply directly to the solar storage tank, may need to add a resistance for preheating (comment from Hertel - may be able to assist).*
 - AI-2: Costas Balaras to contact HQ and request original drawings**

- iv) *Expand section on PV applications; Champion (Atkinson) will prepare an outline but will need help for write up; Nagidi to contribute in sections dealing with sizing/calculations; Thevenard also interested to contribute*

AI-3: *Khalid Nagidi to prepare a short general section on site assessment with three calculation examples; Grid tied PV systems, Off-grid PV systems, Solar thermal systems*

- v) *Consider editing the f-chart section and example; Champion (Morner)*

AI-4: *Svein Morner will follow up again with Sandi Klein (has previously agreed to assist; probably no need for major revision since the method has not changed); any new input is welcome*

- vi) *TC 4.2 will update weather climate data for 2017 version; include extraterrestrial, monthly solar rad data in the electronic version; Need a Champion (Volunteer?); Thevenard (could contribute monthly average solar horizontal rad intensity W/m² if of interest).*

- vii) *Leidel to provide material for enhancing the section on BIPV*

AI-5: *Jim Leidel will prepare a draft of the new material*

- viii) *Ali Hasan (email: idea to provide more info on wind turbines);*

Costas Balaras: could consider building integration of small wind turbines

C. New material/contribution on RES in Ch 34 “Energy Resources” for 2017 Fundamentals maintained by TC 2.8 (Means)

Update by Janice Means: ongoing by TC 2.8, will have to respond swiftly and at least have a small contribution given the short available time

AI-6: *Janice Means to circulate overview of what is expected (Means)*

- *Solicit and coordinate contributions on RES - emphasis on solar and include wind, biomass- anaerobic digestion (Means)*
- *Interested to contribute: biomass (Morner); Siir Kilkis*

D. TC 2.5 New Handbook Ch XX - Climate Change for 2017 Fundamentals (Means)

Matt Ritter, Chair of TC 2.5 subcom charged with writing the new chapter Update by Janice Means: Will attend the TC 2.5 meeting in Orlando **AI-6:** Report back on relevant actions and time frame

- *Follow-up electronically (Means)*
- *Interested to contribute: Todorovic; Gueymard (e.g. on global dimming and brightening of solar radiation)*

5. New Business

No new business

6. Adjourn

The meeting was adjourned at 19:55

Minutes from Handbook Subcommittee meeting (Khalid Nagidi)

Presented Programs for Orlando:

Below are the programs that have been submitted and approved for Orlando. All of these programs

have been sponsored/co-sponsored by TC6.7:

1. Seminar 38 "Cooling with the Sun: Solar PV Cooling".
2. Seminar 49 "Cooling with the Sun: Solar Thermal Cooling".
3. Seminar 50 "Double Skin Facade Design and Application".
4. TC Forum "Building Integrated PV (BIPV) Standardization is an International and Global Need".

Programs Proposed for St-Louis:

Below are the programs proposed for St-Louis:

1. Computer Aided Renewable Energy System Design with Case Studies. (It has been accepted-Seminar 20)
2. N-ZERO from Foundation to Financing: Residential Buildings. (It has been accepted-Seminar 64)