

Energy and Water Conference 2013

Integrated Solutions for Advancing
Technology and Management

Nashville, Tennessee, USA
6 – 9 May 2013

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Energy and Water 2013: Integrated Solutions for Advancing Technology and Management



This conference is organized by the Water Environment Federation in cooperation with the Kentucky-Tennessee Water Environment Association, Water Environment Research Foundation, Alliance to Save Energy, American Council for an Energy-Efficient Economy, Imagine H2O, and the Alliance for Water Efficiency.

WORKSHOP A

Workshop A: Energy Services Performance Contracting: Innovative Delivery that GUARANTEES Energy and Cost Savings!

Monday, May 6, 2013
8:30am – 12:00pm

Room: 103/104
0.3CEUs

- | | |
|---------|--|
| 8:30am | Opening Remarks
Peter Thomson, Black & Veatch |
| 8:40am | Introduction to Performance Contracting
Peter Thomson, Black & Veatch |
| 9:00am | First Breakout Session – Identify Challenges to Implementing Performance Contracting |
| 9:20am | Report out from Breakout |
| 9:40am | Helping a Colorado Town Save 35% on Well Pumping Costs
Justin Rundle, Honeywell Building Solutions |
| 10:00am | Break |
| 10:30am | How a Texas Community Leveraged Guaranteed Utility Savings to Pay for Water and Wastewater Infrastructure Improvements |
| 10:50am | Challenging “Business As Usual” – FWSA Looks to Energy Savings Performance Contracting
Dennis Clough, Energy Systems Group |
| 11:10am | Second Breakout Session – Identify Solutions to Challenges from Breakout Session 1
Jordan Lerner, Energy Solutions, Schneider Electric |
| 11:30am | Report out from Breakout |
| 11:50am | Closing Remarks
Peter Thomson, Black & Veatch |
| 12:00pm | Adjourn |

WORKSHOP B

Workshop B: "Drivers Ed" for the Energy Roadmap

Monday, May 6, 2013
8:30am – 12:00pm

Room: 108/109
0.3 CEUs

- 8:30am** **Welcome, Workshop Format, Background Roadmap**
Alicia Chakrabarti, EBMUD
- 8:50am** **Strategic Management / Organizational Culture**
Ed McCormick, EBMUD
- 9:10am** **Innovating for the Future**
Bill Toffey, Effluential Synergies
- 9:25am** **Demand Side Reduction / Energy Generation**
Dave Reardon, HDR
- 10:00am** **Break**
- 10:25am** **Communications and Outreach**
Jason Turgeon, USEPA
- 10:40am** **Instructions for Teaching Case and Break Out**
Barry Liner, Water Environment Federation
- 10:45am** **Group Address Case Study Questions**
All Speakers and Facilitators
- 11:40am** **Report Out on Findings**
All Speakers
- 12:00pm** **Adjourn**

OPENING GENERAL SESSION

Monday, May 6, 2013

1:30pm – 5:00pm

Room: 108/109

3.0 PDHs

- 1:30 pm** **Welcome and Opening Remarks**
Cindy Wallis-Lage, Black & Veatch, *Conference Chair*
- 1:35pm** **WEF and KY/TN WEA Introductions**
Rick Warner, Washoe County, NV
Wes Sydnor, Louisville MSD, KY
- 1:45 pm** **Robert Balzar**
Vice President, Demand Side Management, Tennessee Valley Authority
- 2:00 pm** **Holmes Hummel**
Senior Advisor, Office of the Undersecretary for Energy
- 2:30 pm** **Cynthia Truelove**
Director and Visiting Scholar, Stanford University
- 3:00 pm** **Networking Break**
- 3:45 pm** **Panel Discussion: Energy Management Challenges and Opportunities for Wastewater Utilities**
Steve Rogowski, Metro Water Reclamation District, CO
Rob Taylor, Washington Suburban Sanitary Commission
George Martin, Greenwood Metropolitan District, SC
Moderator: Charles Bott, Hampton Roads Sanitation District
- 5:00 pm** **Adjourn**

Networking Reception – Center/East Exhibit Hall

Immediately following the conclusion of the Opening General Session, please join us for the Networking Reception held in Center/East Exhibit Hall from 5:00pm – 6:30pm

TECHNICAL PROGRAM

Session EW 1: Treatment

Tuesday, May 7
8:30am – 11:45am

Room: 103/104
2.5 PDHs

Moderator: Jeanette Brown, Manhattan College
Peter Cavagnaro, Johnson Controls

- EW1A 8:30am** **Energy Evaluation of Combination Processes for Secondary Effluent Treatment**
Hong Y. Wang, Dongbum Im, Aki Ito, Naoya Wada, Norihide Nakada, Research Center for Environmental Quality Management, Kyoto University; Michiko Aoki, Yasuhiro Kato, Metawater Co., Ltd.; Hiroaki Tanaka, Research Center for Environmental Quality Management, Kyoto University
- EW1B 9:00am** **Nexus of Energy and Virus Reduction of UF Membrane Filtration Process with Coagulation/UV Irradiation for Wastewater Reclamation**
Suntae Lee, Naoyuki Yamashita, Masaru Ihara, Hiroaki Tanaka, Kyoto University; Kentaro Kobayashi, Hiroaki Tanaka, Hiroo Takabatake, Yuji Tanaka, Toray Industries
- EW1C 9:30am** **Overview and Challenges of Anaerobic Wastewater Treatment: Is there a Place for It in Our Future?**
Jose A. Jimenez, Brown And Caldwell; Charles Bott, HRSD
- 10:00am** **Networking Break**
- EW1D 10:45am** **Achieving Positive Net Energy While Maximizing Use of Existing Assets: The Ejby Molle WWTP Story**
Julian Sandino, CH2M HILL; Per H. Nielsen, VandCenter Syd (VCS) Denmark; Dru Whitlock, Tom Johnson, CH2M HILL; Mads Leth, VandCenter Syd (VCS) Denmark; Thomas Jensen, Michael Nielsen, Ramboll Denmark
- EW1E 11:15am** **NEW (Nutrient, Energy, Water) Sustainability Principles Drive Technology Selection in Advanced Water Reclamation Application**
Randall Boe, Srinivas Jalla, Chuck Crandall, Julian Sandino, Jeremy Kraemer, CH2M HILL; Todd Cleaver, Tyler Richards, Holly Elmendorf, Gwinnett County, GA Department of Water Resources
- 11:45am** **Adjourn**

TECHNICAL PROGRAM

Session EW 2: Alternative Energy

Tuesday, May 7
8:30am – 11:45am

Room: 108/109
2.5 PDHs

Moderators: Priscilla Bloomfield, CH2M HILL
Robert Lonergan, Tetra Tech

- EW2A 8:30am** **High Efficiency Bio-Diesel Production from a Municipal FOG Facility**
Michael D. Curtis, RPM Sustainable Technologies; J. Lanzoni, Siemens; R. Parnas, RPM Sustainable Technologies
- EW2B 9:00am** **Sustainable Energy Management Systems for Wastewater Treatment Facilities**
James C. McCaughey, Narragansett Bay Commission
- EW2C 9:30am** **eVortex: A Novel Energy Harvesting Mechanism for Waste and Storm Water Conveyance Systems**
Mungtra Chuslip, Arun Prakash Jaganathan, Erez Allouche, Louisiana Tech University
- 10:00am** **Networking Break**
- EW2D 10:45am** **Use of Alternative Water Sources for a Trigeneration System: A Case Study**
Priska Grace, Dwayne Myers, Enrique Lopez Calva, Shirley Zhang, Priyanka Mehta, CDM Smith
- EW2E 11:15am** **Demonstrating the Business Case for Biogas-fueled Stationary Fuel Cell Power Systems at Wastewater Treatment Facilities**
Gregory D. Moreland, SRA International; Peter Devlin, U.S. Department of Energy
- 11:45am** **Adjourn**

TECHNICAL PROGRAM

Session EW 3: Greenhouse Gases

Tuesday, May 7
1:30pm – 4:45pm

Room: 103/104
2.5 PDHs

Moderator: Robert Lonergan, Tetra Tech
Priscilla Bloomfield, CH2M HILL

EW3A 1:30pm **Carbon Free Water - A Successful Case Study in Sonoma County, California**
Cordel Stillman, Amy Bolten, Sonoma County Water Agency

EW3B 2:00pm **Estimating Carbon Emissions in Water Supply Portfolio Evaluations Including Recycled Water and Greywater**
Enrique J. Lopez Calva, Shirley Zhang, Dwayne R. Myers, Priska Grace, P. Mehta, CDM Smith

EW3C 2:30pm **Climate Ready Water Utilities: Helping the Water Sector Prepare for and Adapt to a Climate Change**
Laura Dubin, U.S. Environmental Protection Agency

3:00pm **Networking Break**

EW3D 3:45pm **Quantifying Fugitive CH₄ Emissions from Facultative Sludge Lagoons**
Anup Shah, Brown and Caldwell; Lauren Fillmore, Water Environment Research Foundation; A. Detweiler, NASA-AMES Research Center; John Willis, Brown and Caldwell; Brad Bebout, Adrienne Frisbee, NASA-AMES Research Center; Cheryl Kelley, University of Missouri; Jeff Chanton, Florida State University; Leslie Bebout, NASA-AMES Research Center

EW3E 4:15pm **Peak Amplification of Energy Demand, Energy Cost, and Carbon Emission in Water Reclamation and Purification Processes During Diurnal Cycles**
Reza Sobhani, University of California, Irvine; Lory Larson, Southern California Edison; Diego Rosso, University of California, Irvine

4:45pm **Adjourn**

TECHNICAL PROGRAM

Session EW 4: Lessons Learned

Tuesday, May 7
1:30pm – 4:45pm

Room: 108/109
2.5 PDHs

Moderator: John Willis, Brown and Caldwell
Peter Cavagnaro, Johnson Controls

- EW4A 1:30pm** **Energy Consumption Trends in BNR Mixing Technologies**
Lamya Badr, Joe Rohrbacher, Patricia Stiegel, Hazen and Sawyer; Don Howard, Lori Cooper, City of Greensboro
- EW4B 2:00pm** **Making Energy Efficiency Happen - Experience and Lessons Learned in the EPA Region 4 - TN Department of Environment Conservation Energy Management Initiative**
Robert J. Freeman, US EPA Region 4 Atlanta; Jennifer Dodd, Tennessee Department of Environment & Conservation
- EW4C 2:30pm** **Energy Efficient, Sustainable Improvements and Technologies Implemented at Wastewater Treatment Plants**
Brian Sibiga, Wendel; Frank Nerone, Niagara County Sewer District No. 1
- 3:00pm** **Networking Break**
- EW4D 3:45pm** **Minimizing Energy Consumption in Decentralized Wastewater Collection and Treatment Systems**
Kartiki S. Naik, Michael K. Stenstrom, University of California, Los Angeles
- EW4E 4:15pm** **Ten Years and Counting in the Wastewater Process Energy Efficiency Industry: Northern California's CalPOP Program**
Edward C. Myers, Lescure Engineers; John Bidwell, Quantum Energy Services and Technologies (QuEST) Inc.
- 4:45pm** **Adjourn**

TECHNICAL PROGRAM

Session EW 5: Water Quantity

Wednesday, May 8
8:30am - 10:00am

Room: 103/104
1.5 PDHs

Moderator: Jeanette Brown, Manhattan College

EW5A 8:30am **The Water Implications of Generating Electricity: Water Consumption Across the United States Based on Different Electricity Pathways through 2050**

Jordan Macknick, National Renewable Energy Laboratory;
Sandra Sattler, Union of Concerned Scientists; Kristen Averyt,
Cooperative Institute for Research in Environmental Sciences;
Steve Clemmer, John Rogers, Union of Concerned Scientists

EW5B 9:00am **Water and Energy Utilities: Improving Collaboration**

Cindy Dyballa, Dyballa Consulting

EW5C 9:30am **The Importance of Water for Power Generation**

Michael C. Preston, Black & Veatch

10:00am **Adjourn**

Power Day

Note: This session is part of the Power Day Track geared specifically toward electric and gas utilities and their staff.

TECHNICAL PROGRAM

Session EW 6: Control Strategies

Wednesday, May 8
8:30am - 11:45am

Room: 108/109
2.5 PDHs

Moderator: Louann Unger, USEPA

EW6A 8:30am **Watergy in the U.S.: Energy Management, Policy Mechanisms and Technologies to Optimize Energy Use in Pumping and Aeration Systems**
Bruce Lung, Alliance to Save Energy; Lisa Tryson, John Masters, Danfoss; Ryan Graf, Policy Navigation Group;

EW6B 9:00am **Energy Savings from Advanced Process Control: Two Case Studies**
Steven M. Kestel, Matthew Gray, Weixin Shi, BioChem Technology; Junquan Yan, Jieyuan Draining Co.

EW6C 9:30am **Dynamic Energy Footprint Monitoring and Reduction in Energy Demand from Wastewater Aeration Systems via Full-Scale Deployment of Real-Time Off-Gas Analyzers**
Matthew K. Jeung, University of California, Irvine; Lory E. Larson, Southern California Edison; Michael K. Stenstrom, UCLA; Diego Rosso, University of California, Irvine

10:00am **Networking Break**

EW6D 10:45am **Advanced Controls Maximizes Energy Efficiency of a Large Effluent Pump Station**
Curt Wendt, CDM Smith Inc

EW6E 11:15am **Advanced Water Reclamation Minimizes the Energy Footprint: The Riverfront Water Reclamation Facility**
Brooks W. Newbry, Water Technology Group; Kenneth Knickerbocker, Wood, Patel and Assoc. Consulting Engineers; Dan Lueder, City of Cottonwood, Arizona

11:45am **Adjourn**

TECHNICAL PROGRAM

Session EW 7: Water Quality

Wednesday, May 8
10:45am - 11:45am

Room: 103/104
1 PDH

Moderator: Cindy Wallis-Lage, Black & Veatch

EW7A 10:45am

Reclaimed Water Quality Requirements for Electric Utilities
Don Vandertulip, CDM Smith

EW7B 11:15am

Maintaining NPDES Permit Compliance at Power Plants While Using Municipal Treatment Plant Effluent with Variable Ammonia and Nitrate Levels.

Christopher Varnon, Randi Kim, Jospheh Viciere, Nathan Schmaus, Tina Petersen, CDM Smith; Jaron Bergin, Calpine Corp

11:45am

Adjourn

Power Day

Note: This session is part of the Power Day Track geared specifically toward electric and gas utilities and their staff.

TECHNICAL PROGRAM

Session EW 8: Energy Savings

Wednesday, May 8
1:30pm - 3:00pm

Room: 103/104
1.5 PDHs

Moderators: Tom Schwartz, Woodard and Curran
Priscilla Bloomfield, CH2M HILL

- EW8A 1:30pm** **Get It Done! - Using Performance Contracting to Implement Energy-Related Improvements**
Richard Atoulikian, HDR; Clark Wiedetz, Siemens;
Thomas Kochaba, Kim Kennedy, Robert Huffmyer, HDR
- EW8B 2:00pm** **Demand Management Strategies Resulting in Zero and Low Cost Energy Saving Opportunities for Water and Wastewater Treatment Facilities**
Bryan R. Lisk, Hazen and Sawyer
- EW8C 2:30pm** **Aeration Efficiency in Oxidation Ditches**
John Lindam, Xylem Water Solutions AB
- 3:00am** **Adjourn**

Power Day

Note: This session is part of the Power Day Track geared specifically toward electric and gas utilities and their staff.

TECHNICAL PROGRAM

Session EW 9: Biogas

Wednesday, May 8
1:30pm - 3:00pm

Room: 108/109
1.5 PDHs

Moderators: Jeanette Brown, Manhattan College
Louann Unger, USEPA

- EW9A 1:30pm** **Guide to Bioaugmentation for Systems Experiencing Chemical Inhibition using an Operating Envelope**
Robin Schroeder, Martin Maxwell, and Dong Hyun, Environmental Business Specialists, LLC
- EW9B 2:00pm** **CHP System Implementation and Operations Optimization at F. Wayne Hill Water Resources Center**
Richard Schoeck, Gwinnett County Department of Water Resources; Srinivas Jalla, CH2M HILL; Richard Porter, Gwinnett County Department of Water Resources
- EW9C 2:30pm** **Energy-Recovery from Solids in St. Petersburg, FL: Biogas to Vehicle Fuel and CHP**
John Willis, Brown and Caldwell; Steve Leavitt, Steven Marshall, St. Petersburg; Todd Bosso, Brown and Caldwell
- 3:00pm** **Adjourn**

TECHNICAL PROGRAM

Session EW 10: Global Perspectives

Wednesday, May 8
3:45pm - 5:15pm

Room: 103/104
1.5 PDHs

Moderator: Bob Forbes, CH2M HILL

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| EW10A | 3:45pm | Life Cycle Water use for Electricity Generation: Implications of the Distribution of Collected Estimates
James Meldrum, University of Colorado; <u>Jordan Macknick</u> , Garvin Heath, Syndi Nettles-Anderson, National Renewable Energy Laboratory |
| EW10B | 4:15pm | Water and Energy Efficiency through Steam Systems
Angela Ganley, <u>Lesley Smith</u> , Audra Liubinas, Sophea Eng, City West Water |
| EW10C | 4:45pm | Creating New Revenue with Existing Processes: Evaluating Grid Balance with Demand-Side Loads at Wastewater Treatment Plants Using Dynamic Modeling
<u>Daryl Letto</u> , ENBALA Power Networks; Spencer Snowling, Hydromantis Environmental Software Solutions; Raoul George, Christopher Morrissey, ENBALA Power Networks; Hank Andres, Hydromantis Environmental Software Solutions; Conrad Fox, ENBALA Power Networks |
| | 5:15pm | Adjourn |

Power Day

Note: This session is part of the Power Day Track geared specifically toward electric and gas utilities and their staff.

TECHNICAL PROGRAM

Session EW 11: Exemplary Programs That Save Both Energy and Water

Wednesday, May 8
3:45pm – 5:15pm

Room: 108/109
1.5 PDHs

Moderator: Sara Hayes, American Council for an Energy-Efficient Economy

This session addresses a topic at the heart of the conference: how to design programs that achieve both water and energy savings. The case studies to be presented and the speakers to be featured will provide information on best practices in designing and implementing these programs as well as lessons learned through their experiences.

- 3:45pm Exemplary Programs that Save Both Energy and Water**
Mary Ann Dickinson, Alliance for Water Efficiency
- 4:00pm Massachusetts Water Resource Authority (MWRA) Long Term Sustainability Program**
Stephen Estes-Smargiassi, Massachusetts Water Resources Authority (MWRA)
- 4:10pm Southern California Electric Leak Pilot Detection Program**
Gene Rodrigues, Southern California Electric
- 4:20pm City of Boulder Energy Performance Contracting Program**
Joe Castro, City of Boulder, Colorado
- 4:30pm United Technologies Corporation (UTC) 2015 Sustainability Goals Program**
Sean West, United Technologies Corporation (UTC)
- 4:40pm Questions and Discussion**
- 5:15pm Adjourn**

TECHNICAL PROGRAM

Session EW 12: Research

Thursday, May 9
8:30am - 10:00am

Room: 103/104
1.5 PDHs

Moderator: Stephen Tarallo, Black & Veatch

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|--------------|----------------|--|
| EW12A | 8:30am | Looking at the Future: How Metropolitan Sewer District of Greater Cincinnati (MSDGC) is Turning Waste into Resources and Energy
<u>Ting Lu</u> , Biju George, MSD of Greater Cincinnati; Joo-Youp Lee, Mingming Lu, University of Cincinnati |
| EW12B | 9:00am | Energy Consumption of MBR for Municipal Wastewater Treatment Current Situation and Potential
Pierre Cote, COTE Membrane Separation Ltd; Thor Young, Sebastian Smoot, GHD; <u>Jeff Peeters</u> , GE Water & Process Technologies |
| EW12C | 9:30am | Environment Enhancing Energy Innovative Adsorptive-Biological Process to Recovery/Recycle Carbon and Nitrogen from Aqueous Product of Hydrothermal Liquefaction to Maximize Bioenergy Production from Wastewater
<u>Yan Zhou</u> , Lance Schideman, Yuanhui Zhang, X. Zhao, University of Illinois |
| | 10:00am | Adjourn |

TECHNICAL PROGRAM

Session EW 13: Water MSW & Integrated Planning

Thursday, May 9
8:30am - 11:45am

Room: 108/109
3.0 PDHs

Moderator: Jason Turgeon, USEPA

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|--------------|----------------|--|
| EW13A | 8:30am | Sustainable Solutions for the 21st Century - Integration of Water Treatment Systems with Energy Derived from Municipal Wastes
<u>Paul Hauck</u> , Diane Kemp, Valerie Going, CDM Smith |
| EW13B | 9:00am | Integrating Major Components of a New Landfill Gas System - Coordination of Multiple Contracts for Gas Treatment, Pipeline Transmission and Turbine Energy Generation
<u>Ralph Schroedel</u> , Brown & Caldwell; Michael Martin, Cary Solberg, William Krill, Milwaukee Metropolitan Sewerage District |
| EW13C | 9:30am | Integrated Net Zero for Energy, Water and Waste at Army Installations: Establishing Priorities in a Fiscally Constrained Context
<u>Elizabeth Keysar</u> , Concurrent Technologies Corporation (CTC) |
| | 10:00am | Networking Break |
| EW13D | 10:15am | Santa Rosa Case Study - Water, Electric, and Gas Utility Collaboration
<u>Adam Ross</u> , Brown and Caldwell; David Guhin, M. Prinz, City of Santa Rosa; |
| EW13E | 10:45am | Integrating Liquid and Solid Waste Planning to Make Green Infrastructure Pay
<u>Stephen J. Salter</u> , Farallon Consultants Limited |
| EW13F | 11:15am | Embodied Energy of Lost Water: Evaluating the Energy Efficiency of Infrastructure Investments
<u>Craig P. Aubuchon</u> , Analysis Group, Inc.; Alan Roberson, AWWA |
| | 11:45am | Adjourn |

TECHNICAL PROGRAM

Session EW 14: Net Zero

Thursday, May 9
10:15am - 11:45am

Room: 103/104
1.5 PDHs

Moderator: Alicia Chakrabarti, East Bay Municipal Utility District
Peter Cavagnaro, Johnson Controls

- EW14A** **10:15am** **The Most Energy Efficient Pump is the One That's Not Running: A Case Study of Energy Savings Resulting from an I/I Reduction Program**
Kevin Colvett, CH2M Hill; Brent Freeman, Metro Water Services; Todd Spangler, City of Brentwood, TN
- EW14B** **10:45am** **Small Wastewater Treatment Facilities can be Energy Producers**
Joseph C. Cantwell, Science Applications Intl Corp
- EW14C** **11:15am** **The Treatment Plant of the Future Integrated CO₂ Capture for Enhanced Plant Growth**
James W. Schettler, Nancy E. Andrews, Brown and Caldwell
- 11:45am** **Adjourn**