

ASHRAE Ottawa Valley Chapter

Chapter Meeting #6 – 20 March 2018

Meeting Date:	20 March 2018
Location:	Centurion Conference & Event Center, 170 Colonnade Road South
Attendance:	Total: 52
	Members: 38 Guests: 11 Students: 3
Theme:	Student
Tour:	None
Tech Session:	None
Table Top:	Modern Niagara and Hydro Ottawa
Program:	Why Buildings Matter and the Role of ASHRAE 90.1
Speakers:	R. Christopher Mathis
Prepared by:	Aaron Dobson

Social (17:30 – 18:25)

Business Session (18:25 – 18:43)

- President Adam Graham welcome message, call to order.
- President Adam Graham introduced the Board of Governors and the Executive.
- Secretary Aaron Dobson introduced the 11 guests.
- Membership Promotion Chair Celine Baribeau introduced the 1 new member since last meeting.
- This year's nominations and awards Chairs are Steve Moons and Abbey Saunders. Steve Moons talked about building chapter leadership for tomorrow and the open nominations for next year. Dan Redmond will be President, Chris Fudge will be President-Elect, Aaron Dobson will be Treasurer). Steve mentioned they are open to nominations for Secretary and board of governor. Nominations committee will interview candidates who are members in good standing with Chapter and Society. Steve and Abbey will be available to discuss open positions. Nominations committee will meet to discuss nominations and will announce candidates in April meeting. May meeting will install new members to executive and board.
- Adrienne Mitani talked about the recent Career Fair at Carleton University. Adrienne thanked everyone who showed up. There was a great turn out from Employers, Students. Adrienne also thanked companies who sponsored the event. Just under 100 students attended the event.
- Colleen Fox talked about the recent Curling event that took place on March 9th. 18 teams participated, and the winning team was Modern Niagara. Proceeds from the event (\$1,440) will be donated to local charities. In addition, \$610 was raised from the 50/50 raffle which will be donated to ASHRAE research. Colleen thanked Stacey Gillis and Stan Millross for volunteering at the event. She also gave special thanks to Chris Healey who has ran the event for many years.
- CTTC Chair Jacob Hough talked about Technology awards. Deadline is this Friday to submit tech awards. Questions regarding completion of form can be sent directly to Jacob. Jacob mentioned the Seminar on ASHRAE 90.1 happening tomorrow.

- Student Activities Chair Peter Shaw-Wood talked about this month's theme – Students. There has been a good turnout of Students to all events happening with the Chapter. There has been good traction with meeting at the local schools. There was a Presentation at Carleton University with the Speaker Chris Mathis where 20-25 Grad Students and Professors attended. Peter mentioned he is pleased to see former Students, now working in the industry at the chapter meetings. Peter mentioned student meal sponsors are low and he would appreciate if members could sponsor student meals.
- Adam Graham invited the companies to talk about their table-tops. Andrew Klassen from Modern Niagara talked about their products in building automation and different disciplines such as plumbing, electrical, HVAC. Trevor Freeman from Hydro Ottawa talked about the Save on Energy program.
- As part of the Donor Recognition for Hydro Ottawa, Adam Graham presented Trevor with a donor recognition plaque for their support to the Ottawa chapter and Adam invited Trevor to talk about the program. Trevor mentioned the goal is to promote energy efficiency and reduce electricity consumption in their service territory. Hydro Ottawa has a dedicated team to focus on conservation. The programs are for new construction, retrofit programs or anything to reduce electricity consumption. Hydro Ottawa will help fund the projects.
- Past-President Abbey Saunders talked about the raffle tickets donated by JCI.

Business Session Finished at 6:43pm

Dinner (18:43 – 19:27)

- Dinner served at 6:43pm
- Dinner was Garden Salad for starter. Roast beef with potatoes, carrots and asparagus for main and black forest cake for dessert

Evening Program (19:27- 20:40)

- Evening program started at 7:27pm
- Adam Graham invited Christopher Mathis to draw the winning raffle ticket. Winner of the Ottawa Senators tickets was Andrew Brown. Adam mentioned that \$640 was raised for ASHRAE research promotion thanks to JCI.
- Adam Graham introduced the speaker Christopher Mathis. Christopher Mathis is an ASHRAE Distinguished Lecturer and topic for the evening is Why Buildings Matter and ASHRAE's Critical Role in the Future of Building Performance
- Chris started the presentation with the end in mind. Buildings matter, more than we know. There is a lot going on in the world which will be discussed, most of which will make us uncomfortable (energy, power, water, climate etc.). What does the future hold with emerging building performance priorities, implications for building professionals (Engineers, Architects, Code Officials, Contractors, Owners) and what is our responsibility in all of this.
- Chris gave an overview of who he is. A building Scientist for 35+ years, an Author, Educator, Standards developer and user. He has been an ASHRAE member for over 30 years and helped develop codes for US and several states. As a beekeeper, Chris talked about the importance of honeybees.
- Chris talked about the US energy pie on US Energy Use. Transportation is 29.0%, Buildings is 39.4% and Industry is 31.6%. Buildings has the largest energy use which is

split between residential (20.7%) and commercial (18.7%).

- Chris talked about a graph showing energy production by source. The largest being natural gas at 39%, then petroleum at 23%, Coal at 17%, Renewables at 12% and Nuclear at 9%. The interesting part of the graph, which is the scary part as 80% of it is from a finite resource – fossil fuels. Projecting to the future to see where we are going to be, the fuel mixture (Coal, Natural Gas, Petroleum, Nuclear, Renewables) is not going to change much. What’s going to change is the consumption because we want more. Projecting out worldwide, with every fuel, everywhere, everybody, the same will occur because everyone will want more.
- Don’t do what we do. Diversify energy and power sources. Know what “finite resource” means and decentralize where possible. Put power production close to need.
- In Canada, the energy use is similar to the US. The energy use in Canada for buildings is 27%. Looking into the future for growth by sector, nothing is flat. The largest growth rate from 1990 to 2013 was transportation at 43%, followed by agriculture at 40%, Industrial at 30%, Commercial/Institutional at 23% and Residential at 7%
- Chris showed the energy use for commercial and residential with more than half being consumed by space heating.
- From a Canada savings perspective, the energy use in Canada increased 31% between 1990 and 2014. It would have increased 55% without energy efficiency improvements.
- Chris talked about the world population and the doubling rates of populations which is getting shorter and shorter and what the population is going to need (homes, jobs, schools, hospitals etc.). The population is expected to double in 30 years.
- For World population trends, in the next few years India will surpass China as the World’s most populace Country and Nigeria will surpass the US as the 3rd most populace country by 2050. All the countries want the same thing, the same quality of life that the US has benefited from.
- Chris talked about the issues with water in the US. There has been a water war in the south-east. The reason for the importance of water is for the use in creating electricity. More than half of the surface water extracted is used for making electricity. The volume of water flowing through America’s utilities is 3 times the amount flowing over Niagara Falls. The water is used for cooling in coal and nuclear plants. Coal and Nuclear Plants use 30-50 gallons of water to produce just 1 kWh of electricity (once through cooling).
- 93% of US Commercial buildings were built before 2003. Most of the buildings would not meet the 2004 energy code. 74% of buildings was built before 1989. Existing buildings matter. They have one thing in common. They are close to infrastructure (water, roads). Recognize, prioritize and bring best the professional skills to addressing the performance of existing buildings. Value their performance for a long time. The same is for residential buildings. In a good year, the US builds 1 million new homes. There are 130 million existing homes in the US.
- Chris went through life expectancy of old buildings in Canada. Buildings that are around 200 years old which are young by European standards.
- For US commercial construction in 2035, half of the commercial floor space in the US will be new buildings built from 2010. This will involve retiring old buildings with new. There is estimated to be 105 billion square feet of commercial buildings in the US by 2035.
- Other trends are environmental trends. There are more severe climate events such as superstorms, extreme cold “polar vortex” and extreme heat. Chris talked about the world breaking a new heat record for July in 2015 since modern record keeping began

in 1880. October smashed record for global warmth. This keeps 2015 on track to be the hottest year since 1880. Ten of the hottest years have been since 1998. Since then 2016 has surpassed 2015 as the hottest year.

- Chris talked about how everybody everywhere wants what we have. Chris went through a graph showing if there was air conditioning for everyone around the World at the same rate as the US. The World would not be able to provide enough electricity to provide air conditioning to everyone.
- The primary friction in the system is our resistance to change.
- What is the building code? It is the least safe, least strong, least energy efficient building allowed by law. In other words, we are not allowed to build it any crappier. It does not mean the building code is crappy, it means it is the starting point for anything better.
- How do we make codes? We wait for a disaster, we wait until we hurt. The first code we know of is the Code of Hammurabi – 1750 BC. It contains five key elements designed to protect the occupants. Disaster breeds codes. The burning of Rome in 64 AD was because the Emperor Nero did not like the slums and stench. This established fire safety and sanitation requirements for all buildings following the fire. The Great London fire in 1666 could not get the fire wagons to the buildings in time and the buildings were full of flammable objects. Two-thirds of the City was destroyed. The London Building Act was adopted after the fire which was the first fire code. In North America the Chicago fire in 1871 destroyed 17,000 buildings. This bankrupted the insurance industry and the resulted in developing a new code in 1875 for regulating building construction and fire protection. The San Francisco earthquake in 1906 was the major influencer of today's structural, fire and life safety codes. The Arab Oil Embargo in 1973-74 precipitated the first energy codes for buildings – ASHRAE 1975. Consumer signals about energy was created as a means of comparison (EPA fuel economy for automotive, energy guide for appliances).
- Chris went through pictures of natural disasters and the resulting changes that were made because of damages. An example was Hurricane Andrew in August 1992. The hurricane ripped shingles off roofs which went through neighbor's windows causing water damage in the homes from rain. This led to the insurance industry changing the rules to have aggressive roof tie downs and impact resistance windows in high wind zones. Following Hurricane Katrina, Louisiana and Mississippi adopted their first building codes.
- Chris went through pictures of homes that were devastated from different natural disasters, including the super typhoon Haiyan in 2013 which was the strongest storm in recorded history. A category 5 event with sustained winds of over 96 mph for several hours. Wind speeds more than 260 mph.
- History has shown that we wait for disaster before we act. There are consequences to waiting. Do not wait on disaster or difficulty to act. Prioritize building performance now (energy performance, durability, resilience, water use, IEQ, etc)
- ASHRAE's leadership role is to advance the arts and sciences of heating, ventilating, air conditioning and refrigerating to serve humanity and promote a sustainable world.
- Chris went through the ASHRAE 90.1 energy code from 1975 to present. The code minimum is still a long way from net zero. The normalized energy use index (1975 = 100) is now around 50 for ASHRAE 90.1-2016. The code is not leading edge, not superior performance, not exemplary, not green, not sustainable, not differentiation. It is the starting point for all differentiation.

- Chris talked about the road to “Net Zero” with raising the minimum standards and how everybody wants to be green with ASHRAE 189. He gave examples of problems with green buildings how they use more energy than the code baseline.
- What about those other objectives (durability, resilience, IEQ, comfort, water savings, carbon)
- Chris talked about our responsibility as ASHRAE leaders. Get engaged in local code adoption and compliance. Support local building performance education. Commission building envelopes, HVAC, lighting systems, controls. Measure leakage, comfort conditions, air flows, radiant asymmetry, water use, energy use for new and existing buildings.
- EIA projects world energy consumption will increase 56% by 2040.
- Buildings matter. It is up to knowledgeable building industry professionals to deliver this message. There are major trends impacting building decisions such as environmental trends, human expectation trends, population, water, power. The latest energy code is the starting point for building performance
- Questions – 2 questions were asked
- President Adam Graham thanking the speaker and presenting gift (commemorative coin) to Chris Mathis from ASHRAE Ottawa Valley Chapter
- President Adam Graham reminding members and guest to fill out evaluation form
- President Adam Graham saying thank you and reminding that next meeting is April 17th, 2018 at the Centurion Conference Centre.

Meeting adjourned 8:40