

## Final Plenary Consultation MDEC 2020 - Virtual Conference

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MDEC Conference, Co-Chair

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## MDEC Mission Statement

Mining Diesel Emissions Council is committed to providing a global forum for the dissemination of the latest scientific and technologically advanced research to reduce and control diesel emissions in the mining workplace environment

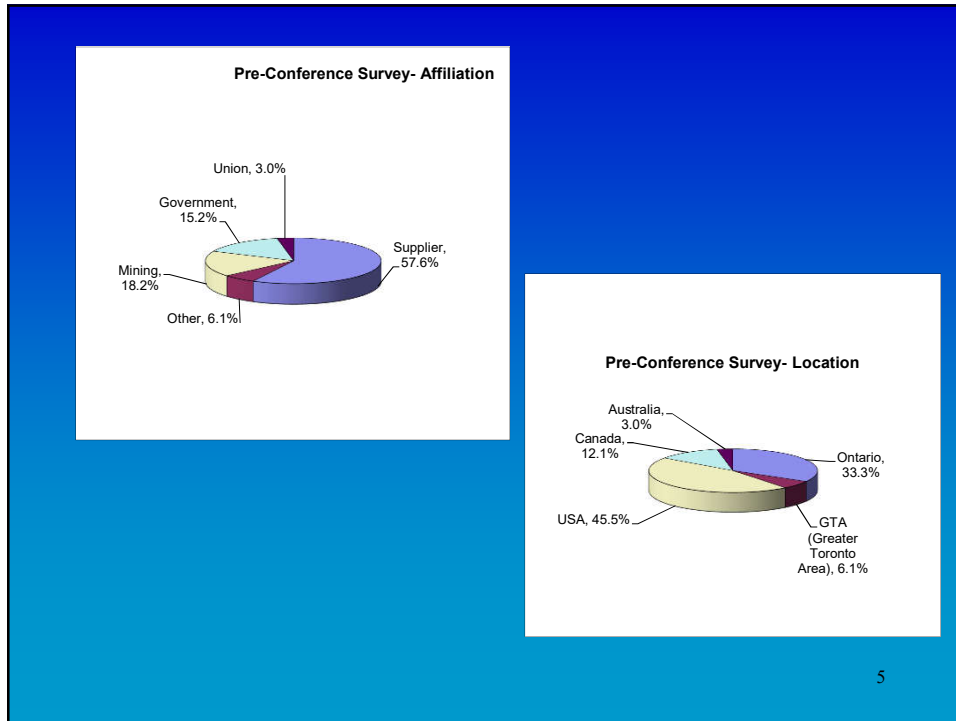
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# MDEC Pre-Conference Survey

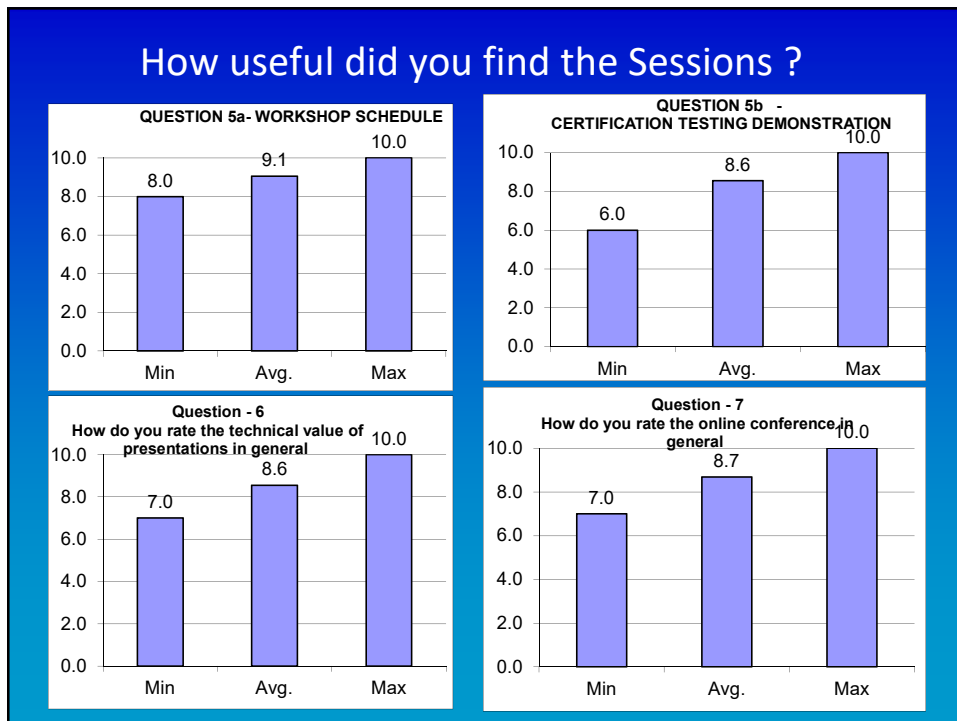
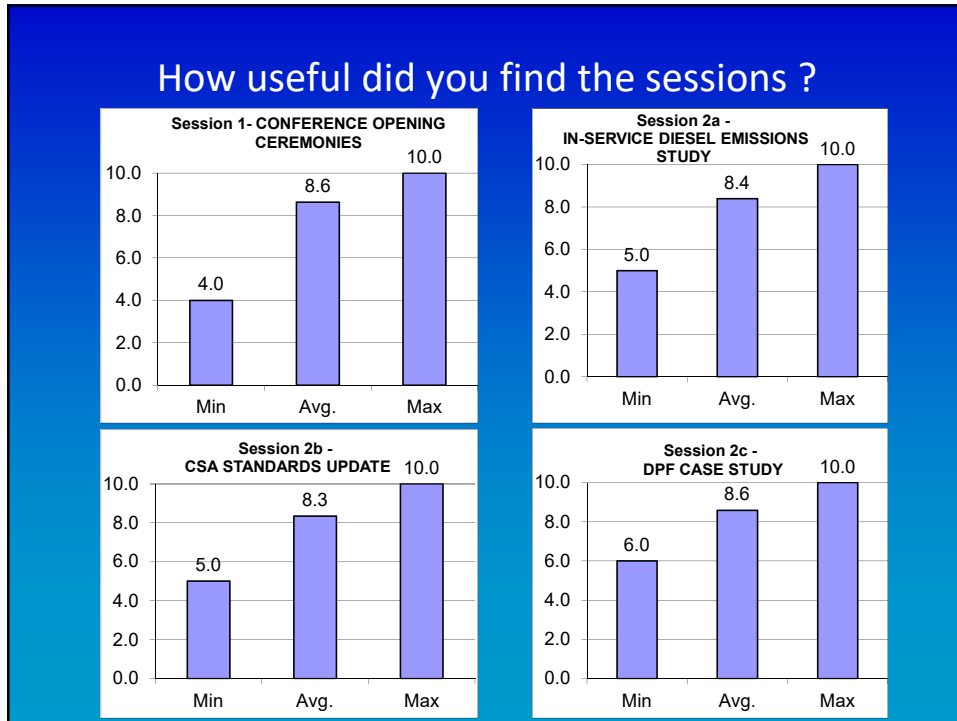
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Q 1 - Attend shortened virtual conference?	Q 2 - Zoom?	Q 3 - Topic suggestion?	Topic?	Q 4 - Affiliation?	Q 5 - Location?	Q 6 - Sponsor?
Yes	Yes	Yes	Implementation case study, lessons learned	Government	Ontario	No
Yes	Yes	No		Union	Ontario	No
Yes	Yes	No		Manufacturer	GTA	Yes
Yes	Yes	No		Manufacturer	USA	?
Yes	Yes	No		Mining	Ontario	No
Yes	Yes	No		Manufacturer	Ontario	No
Yes	Yes	Yes	Maintenance of advance engine technologies	Government	USA	No
Yes	Yes	Yes	Stage 5 engines. Effects of altitude/ elevation on PDF perf.	Manufacturer	Canada	Yes
Yes	Yes	No		Mining	Ontario	No
Yes	Yes	No		Manufacturer	USA	No
Yes	Yes	No		Manufacturer	USA	Yes
Yes	Yes	No		Manufacturer	Canada	Yes
Yes	Yes	Yes	Battery or hydrogen adoption	Manufacturer	Ontario	No
Yes	Yes	Yes	DPF Basic Maintenance	Mining	USA	Yes
Yes	Yes	No		Manufacturer	USA	No
Yes	Yes / Teams instead?	Yes	EV Requirements underground?	Manufacturer	Australia	No
Yes	Yes	No		Government	Canada	No
Yes	Yes	No		Mining	Canada	Yes
Yes	Yes	No		Mining	Ontario	No
Yes	Yes	Yes	Electrification/Automation (robotic)	Manufacturer	USA	No
Yes	Yes	No		Government	Ontario	No
Yes	Yes	No		Manufacturer	USA	Yes
Yes	Yes	No		Manufacturer	USA	No
Yes	Yes	No		Manufacturer	USA	Yes
Yes	No - Company doesn't allow zoom	No		Manufacturer	USA	No
Yes	Yes	No		Manufacturer	Ontario	Depends on # of participants
Yes	Yes	No		Government	Ontario	No
Yes	Yes	No		Manufacturer	USA	No
Yes	Yes	No		Manufacturer	USA	Yes
Yes	Yes	No		Other - Distributor	USA	Yes
No	No	No		Mining	Ontario	No
Yes	Yes	Yes	Update on underground emissions	Manufacturer	USA	Yes
Yes	Yes	No	targets/regulations	Other - Distributor	GTA	No
100%	97%	24%		Responses	33	13

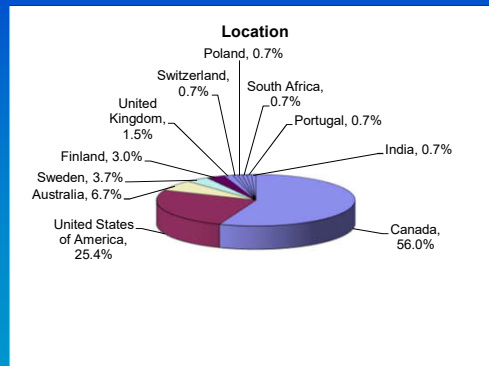
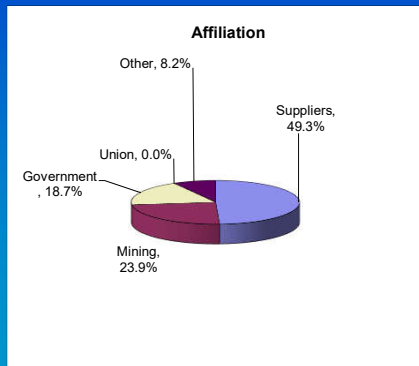
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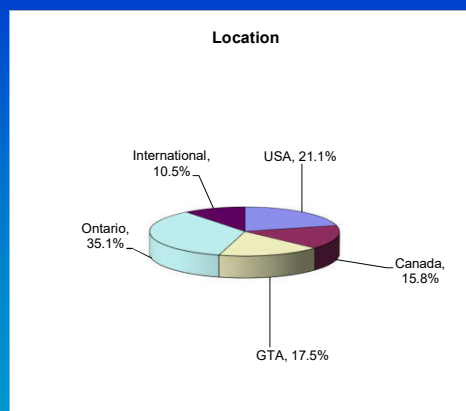
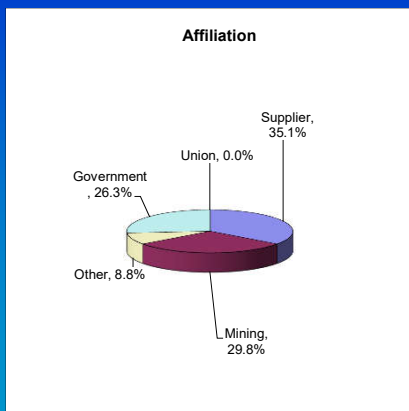
- ## Summary - MDEC Virtual Conference 2020
- October 6-7, Zoom platform- On-line through Workplace Safety North (WSN) and CanmetMINING
  - Number of delegates registered Day 1 and 2 – 140 (not counting organizers/presenters)
  - Day 1- October 6: SESSION 1: Keynote Address: “Diesel particle deposition in the airways and the induction of inflammation”, Sandra Dorman, Director, Centre for Research in Occupational Safety and Health, Professor, School of Human Kinetics, Laurentian University  
Panel Discussion- Developing Innovative Strategies for Improving Safety and Lessening DPM Exposure to Workers in Mines - A Global Focus.
  - SESSION 2: Diesel Engine Certification and DPF Implementation
  - Day 2 - October 7: Workshop: Canadian Diesel Engine Certification and Demonstration, hosted by CanmetMINING and Southwest Research Institute (SwRI)
  - Number of Attendees – 65 (not counting organizers/presenters)
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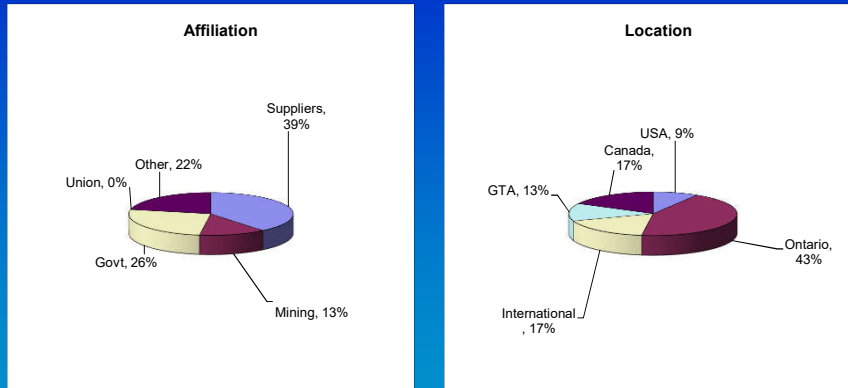
## Delegates Affiliation & Location (Registration Day 1 and 2)



## Delegates Affiliation & Location (Poll- Day 1)

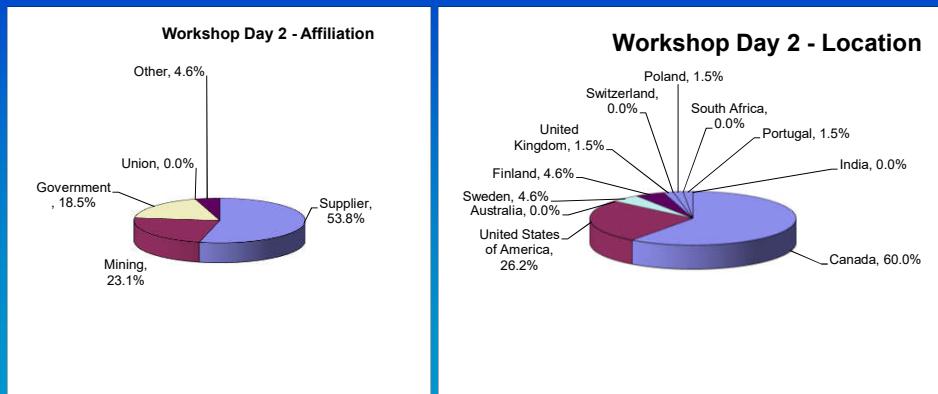


## Delegates Affiliation & Location (Survey- Day 1)



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## Delegates Affiliation & Location (Survey- Day 2)



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## Comments - MDEC 2020 Surveys

### Day 1:

1. The 1st virtual conference was excellent. Length of time was good and the selected speakers had quality presentations.
2. Very well facilitated over the course of 2 days. I also liked the technical content. It was of the appropriate length for online conference The Zoom platform seemed to work well.
3. Interesting and well organized.'
4. Great to have the conference via the web instead of cancelling it. Good work! Very professional with the presentation part. For us overseas it is enabling presence at the conference to a much degree when traveling is more difficult and/or restricted.
5. I would like to see an option for the future to be able to participate virtually this way I can participate as it is not always possible (schedule & budget permitting) to travel from BC to ON.

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### Day 1:cont.

6. I enjoyed the conference and plan to attend future conferences.
7. I could not answer Q#2 above - Yes, it was a good conference and I am satisfied with how it was organized.
8. I would like to understand more on the depth/altitude emission variance - recommendations ? Following the field study should we expect any changes or recommendations to CSA standard to suit underground application ?
9. All things considered it was a good forum to have the conference go ahead. While not as informative as an in-person event, it was well organized and relatively glitch free.
10. Despite this is the first on line conference, it is well prepare and coordination. Hope to see number of participants in the summary. Also, looking for the future map of diesel, BEV and Hydrogen technology for underground and Surface mining. Bravo, excellent, well done. Many thanks.

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**Day 1:cont.**

11. The keynote speaker made a well organized presentation, which helps understand how DPM affects the lungs and health in underground mines. This would be a good example to introduce a close form science in the conference.
12. Conference was excellent and flowed well.
13. Thank you for the conference, everything was great. There are two suggestions that I would like to make: 1) originally you offered 2 levels of the sponsorship, however, in the end there was only one option left. Since our marketing department had a cheaper sponsorship approved, we couldn't participate this year, as the option we've chosen was no longer available. 2) I would suggest to have a short break during the conference, as 2.5 hours straight is hard to sit in one place. 3) Publish the conference video online. I missed the second day due to other company priorities, but it would be nice to watch the presentations.

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**Day 1:cont.**

14. The format for the conference worked well, but found there were competing demands on my time the did not allow myself to attend day 2. Being in person allowed myself to dedicate to the conference and not be pulled away.
15. This is the first time I've attended the MDEC conference and I hope to join you every year. Looking forward to Toronto next year. What I've heard over the last 2 days is exactly the subject we're addressing right now and the main focus of our business so very relevant and very helpful.
16. Fantastic key-note by Dr. Sandra Dorman.
17. Great first virtual event might worthwhile discussing this as an option for furthering MDEC support.

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### Day 2

1. The certification testing demonstration were great but somehow technical. Maybe an introduction to the process with more diagrams and the variables monitored plus the technology available and how would have help? For airflow calculation, maybe a practical example of the calculation would have been useful. Overall great, good job organizing and making it happen. Looking forward to the next one.
2. The certification demonstration was a unique opportunity for most of the delegates, who otherwise would not be able to witness such a test or understand the process of certification.
3. Very well done. It was of the appropriate length and the technical information was very good.

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### Day 2 - Cont.

4. The demonstration of the test facilities was a bit long in my view but the general information was interesting. Good job to keep the conference going in spite of the pandemic! Perhaps there can be a possibility to join online in the future to? It would certainly add more international attendees.
5. I thought that it was great how the MDEC was more accessible this year to colleagues who might not normally attend. I believe that this helps raise the profile of the work that is being done by Canmet and private industry. While, SWRI's demonstration was good, I would have liked to have seen a live demonstration at CanmetMining. This would have been an excellent follow-up to the presentation delivered by Canmet on the certification process. I hope next year you will also offer virtual attendance, even if you hold an in-person conference. It is by no means a replacement for the interactions that occur in-person; however, it allows participation of a wider audience. Thank you.

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**Day 2 - Cont.**

6. If MDEC is forced to do a conference like this again, you could consider breaking the day into two sessions with additional workshops or papers reviewed so additional topics could be covered. The technology and event coordination would easily allow for this as the technical glitches were very minor.

7. Also, looking for the future map of diesel, BEV and Hydrogen technology for underground and Surface mining. Bravo, excellent, well done. Many thanks

8. The Canmet diesel certification process presentation provided a wide range of information on how the engine was certified and airflow determined, e.g. EQI and single gas whichever is higher. This would help the user better understand and choose the right flow in mine ventilation design.

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**Day 2 - Cont.**

9. I'm not just giving 10 for everything for the sake of it - I genuinely mean it You've no idea how relevant and meaningful this is to our business Thanks you so much for including us and we look forward to seeing you next year If anyone would link up on LinkedIn and endorse what we're doing we would appreciate it Many thanks again

10. Good job of organizing and carrying out the conference in light of the current situation.

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**Day 1 – Comments/Questions.**

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1. Sandra thank you so - much have you an opinion on the sampling methodology as per NIOSH 5040 which is a mass based measure of TC and EC
2. Is there a difference in particle deposition and composition pre-emission control era (oil based drill oils/tobacco smoke/no controls) vs. current emissions (water based drill lubricants/no smoking/current emission controls)?
3. Would asthmatics or copd sufferers be at greater risk of deposition?
4. Have you got any thoughts about combined exposure to PM2.5 and PM1 and coronavirus
5. Thanks Sandra. Can you comment on how you would like to see this reflected in Practical Guidelines and Regulations?

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6. Thank you for presentation. Do Elemental Carbon and Organic Carbon have similar deposition reach in the respiratory system?
7. Would the impact of pre-existing smoking history and diesel exposure be a synergistic health effect (ie. like asbestos) for lung cancer or chronic disease? Or additive?
8. Thanks Brent - lots of factors at play (fuel, engine load, engine maintenance, etc) - what consideration is given to depth or elevation?
9. When taking the emission data from the ECOM, how long did you hold the vehicle to establish steady state at the various points (low idle, high torque, etc.)? Did you take several readings and average them or wait for a steady reading?
10. Does CSA have a standard for Line of Sight testing for underground equipment?
11. Question to Hanna, we agree sampling is important to achieving a better environment for the workers. Is there a sample location criteria being followed? not just selecting locations where there is ample fresh air

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13. This question is directed towards Brents presentation related to in-use testing. Because an underground mine is largely a closed environment and emission limits are based on safe exposure limits for mine personnel (i.e. NO<sub>2</sub> < 3ppm over 8-hour shifts), have ambient air monitors been implemented and/or considered as a means to confirm diesel engine operation and ventilation effectiveness over time?
14. Is there an occupational hygienist on the committee
15. For Hannah : What are your thoughts on sharing redacted sampling data to help drive change / provide evidence for prevention efforts?
16. To clarify, yes sharing data outside the organization to help with prevention

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**Day 2 – Zoom - Comments/Questions.**

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**Day 2 – Comments/Questions.**

- Brent: What are the additional engine speeds (outside of intermediate and rated speed, LI and HI) used in 18-mode test?
- Brent, when calculating the EQI, do you use the maximum reading of each contaminate or do you calculate the EQI at each test setting and then take the highest EQI for the engine?
- Brent: Is there intention to modify EQI equation to accommodate for changes in ACGIH TLV s (PELs) and DPM standards?
- Interested in the Tier 4 engines requiring 130 CFM/bhp - would you share what horsepower range these were in? Was this due to the high levels of NO<sub>2</sub> they create?
- "Brent, this is George Lin from Caterpillar. Can you speak to the practical differences between CANMET approval by an engine manufacturer, vs by a third party such as a dealer or customer?"

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### Day 2 – Comments/Questions (cont.).

- Brent: How EQI equation can be improved to better align with efforts to promote introduction of EPA Tier 4 f and Euro Stage V engines (get more emphasis on DPM emissions)?
- Devin: Can you elaborate on the process of establishing DPM emissions for 8-mode ISO 8178-C1 and 18-mode CANMET test. How long engine is operated per mode ? How many samples are collected? How the information on mode contributions is integrated to determine weighted average DPM emissions?
- Devin: Can you explain how particulate number measurements are done for Euro Stage V certification?
- Devin Kelly: Besides the SwRI's sensors connected to the engines, did you connect to the OEM engine's ECM to record any data that will later used for the analysis? If yes, how do you verify its values are programmed, scaled correctly?

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### Day 2 – Comments/Questions (cont.).

- Thanks Devin
- Thanks for presentation. Is SWRI capable of conducting field measurements at mine sites ; such as emission measurements?
- For Brent, why are there two ventilation rates specified on the website for each engine? One example is ~10x the first rate.
- Brent Rubeli: The powertrain for mobile equipment underground is trending toward to battery electric powered, what are your thought about the next diesel engine technologies such as Tier 5...etc....?

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## Final Remarks

- Send your suggestions to improve MDEC
- Visit mdec website at [www.mdec.ca](http://www.mdec.ca)
- Thank YOU - delegates, presenters, chairpersons, committee members, audio/video and hotel management – for a successful conference
- See you next year at MDEC 2020 Conference

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## Plans for MDEC 2021

- Conference date - October 5 – 8, 2021
- At Hilton Toronto Airport Hotel
- More Information at [www.mdec.ca](http://www.mdec.ca)
- Need your help and suggestions:
  - Technical presentations
  - Keynote speakers
  - Workshop
  - Field trip
  - Any other ideas

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