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Canadian Oil Sands are
Set to Decline Within
Next Few Years Even as
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**Tips for
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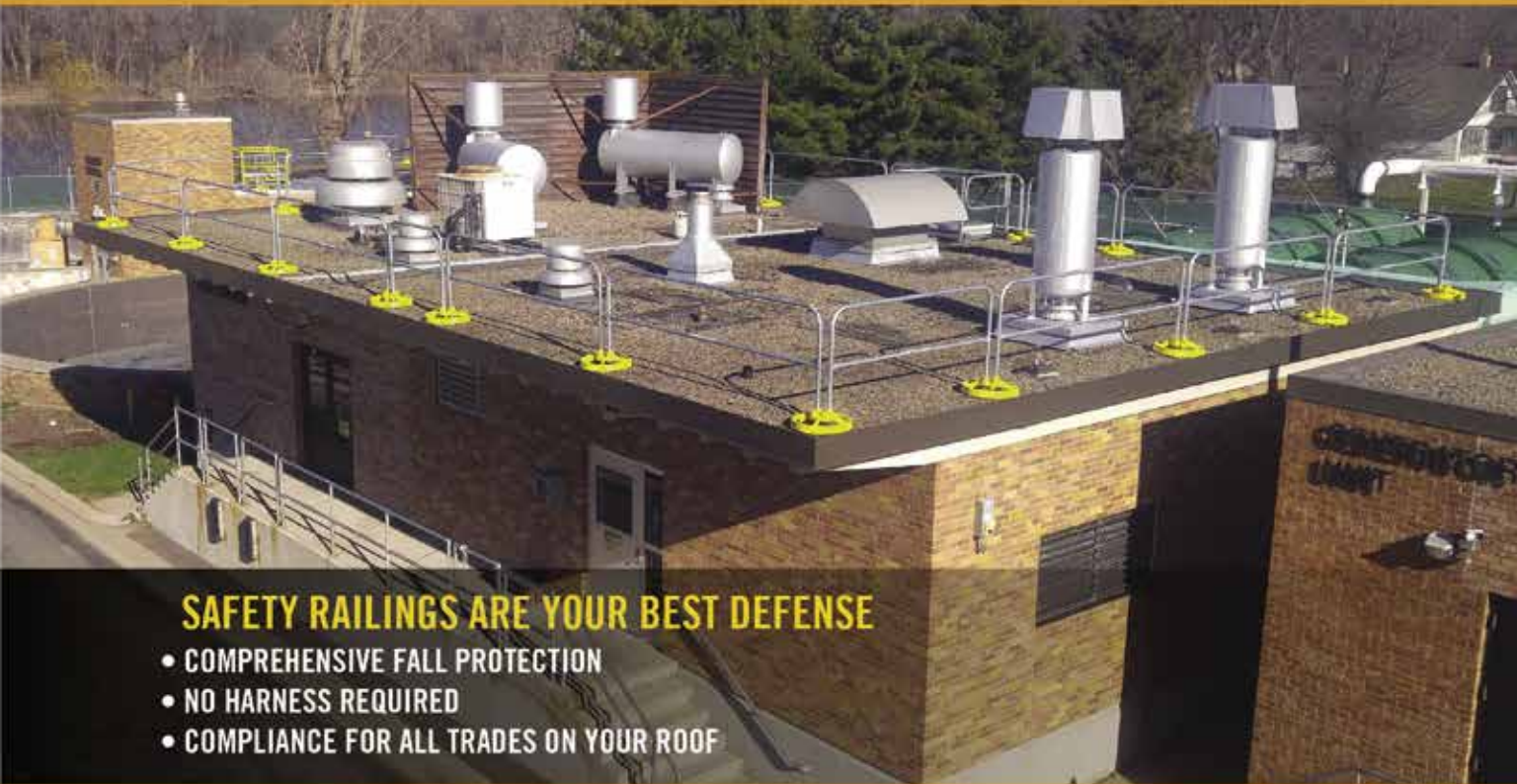


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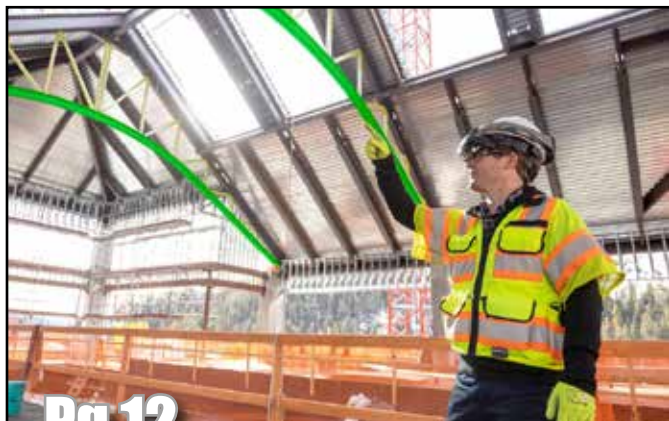
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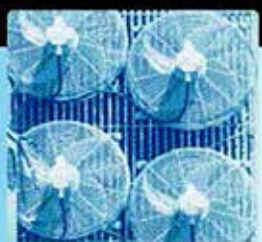
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Power Tool Institute identifies easily employed best practices

Power tools and their batteries are rugged instruments designed to perform tough jobs, but they still require care to maintain safe, optimum performance. There are steps users can take to extend tool and battery life, and help keep power tools operating at peak performance for a longer life cycle.

The Power Tool Institute has compiled a list of best practices for safer use of batteries and power tools.

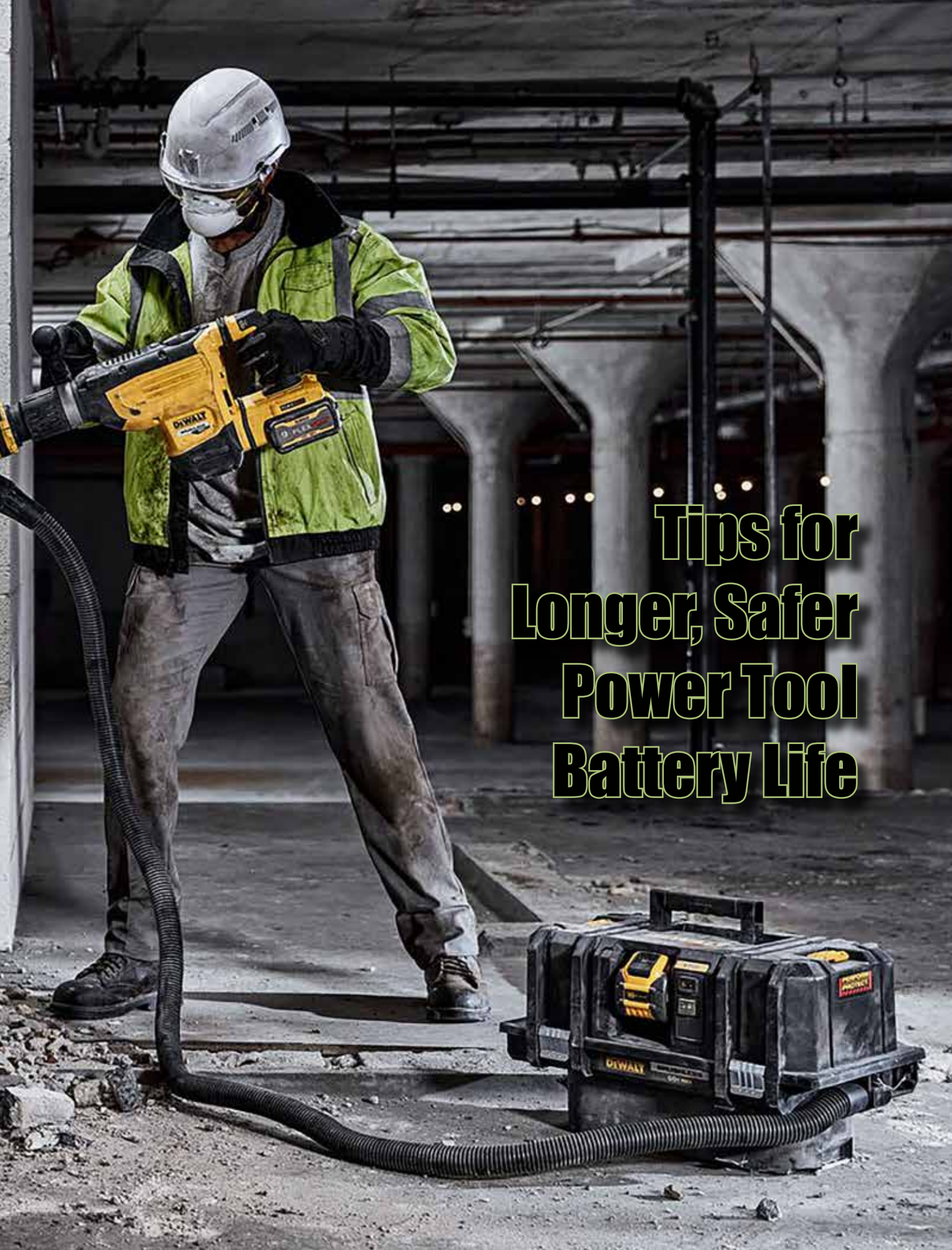
Safe handling

Start by reading the manufacturer's instruction manual – and only use original manufacturer's system components of tool, battery and charger. Do not impact or damage a battery (for example, do not use it as a hammer), use it solely for the defined purpose as specified by the manufacturer. If a battery has received a sharp blow, been dropped, or is damaged, discontinue use.

Regularly inspect batteries for signs of damage, such as crushing, cuts, or punctures. Be mindful of abnormal battery behavior, such as failure to fully charge or hold a charge, longer-than-usual charging times, noticeable drop in performance, liquid leakage from the battery, or melted plastic anywhere on the pack. These are indications of an internal problem.

Never modify, disassemble, or tamper with the battery because the performance can become unpredictable and dangerous. As a general practice, it is best to unplug battery chargers and remove battery packs from them when not in use.





Tips for Longer, Safer Power Tool Battery Life

Safe storage

Do not store batteries on their chargers. Always use and store the battery within the temperature limits stated by the manufacturer. Do not store in a closed location where sunlight may cause elevated temperatures, such as near a window or inside a vehicle. Do not store or transport the battery in a container with loose metal objects, such as coins, keys or nails, which may contact the terminals.

Safe response to overheating

Though batteries and chargers are safe to use when operated properly, in rare instances a battery may overheat. If the battery is exhibiting signs of overheating (flames, smoke, smoldering, or melting), immediate action is required. If connected to a charger when exhibiting signs of overheating, always unplug the charger first. After unplugging the battery charger, then pour copious amounts of water on the battery and then submerge the battery (including any attached tool or charger – do not directly touch/disconnect the battery) in a sturdy container filled with water. When transferring the battery, avoid direct contact with the battery (use a long-handled shovel) and use appropriate personal protective equipment to protect face, hands and body, since there is a risk that overheated batteries may vent, explode, or emit flame.

If the battery is exhibiting flames, continue using copious amounts of water until the flame is extinguished, then submerge the battery (including any attached tool or charger) in a sturdy container filled with water. If water is not available, dirt, sand or a conventional ABC extinguisher may be used in an attempt to smother and cool the battery until water is available.

Keep the battery submerged, in a well-ventilated location, for at least 24 hours and at least 15 feet away from any combustible items. Contact the manufacturer for guidance on proper disposal.

For more information about extending the life of power tools and their batteries, visit <https://www.powertoolinstitute.com/>.

About PTI

With the vision to unify and educate others about power tools, since its founding in 1968, the Power Tool Institute (PTI) has established itself as the leading organization for building global understanding of power tools and for maintaining high standards of safety in the industry. Its members, a list of whom can be found here, represent market-leading brands in the areas of portable and stationary power tools. PTI's members are committed to improving the industry and to being the premier resource for power tool education. For more information, contact PTI 216-241-7333 or pti@powertoolinstitute.com.

On the Web: www.PowerToolInstitute.com and www.TakeChargeOfYourBattery.com •

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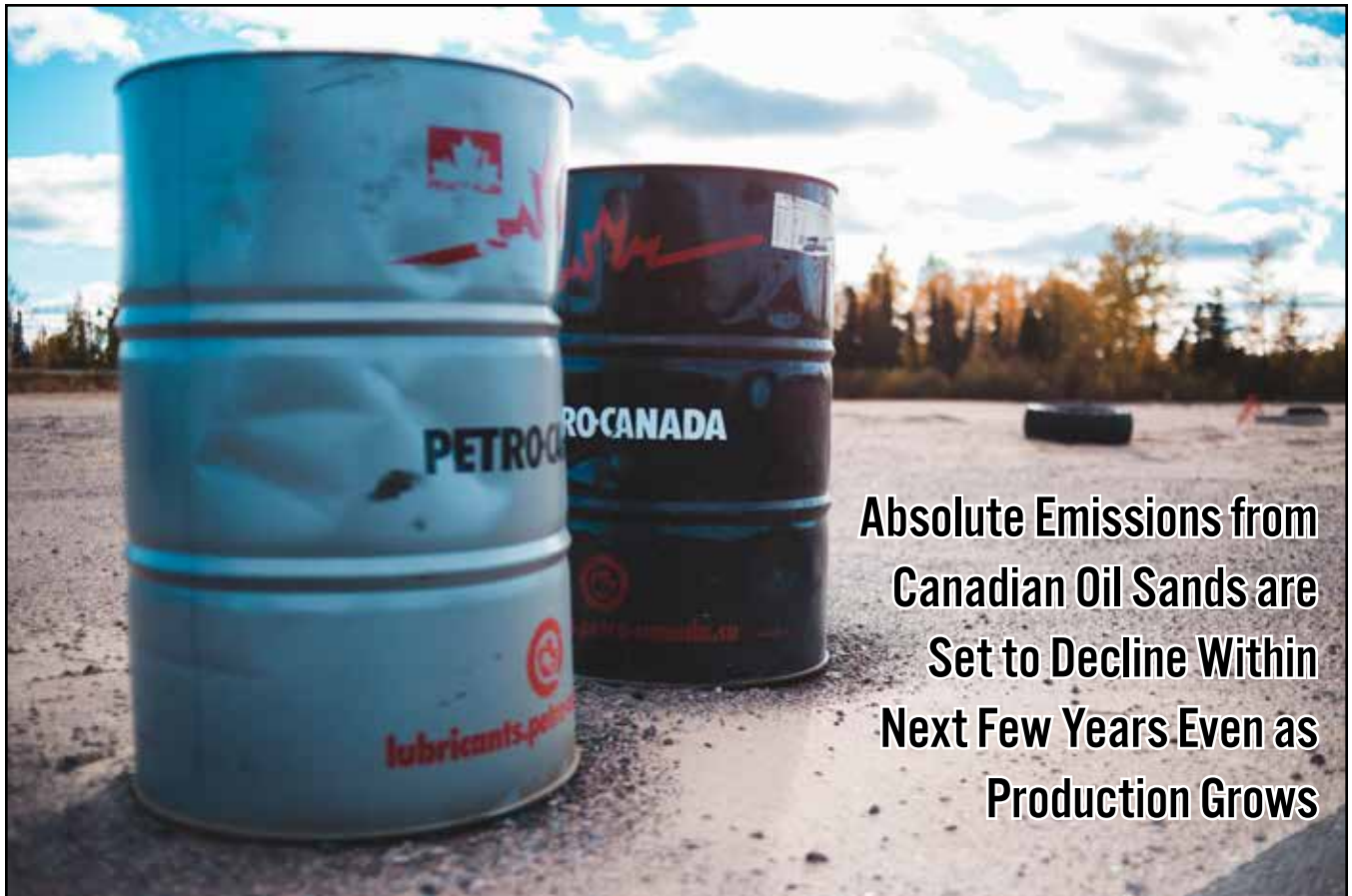
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Absolute Emissions from Canadian Oil Sands are Set to Decline Within Next Few Years Even as Production Grows

New S&P Global Commodity Insights report finds continuing efficiency improvements, as well as new technologies, are poised to overtake slowing production growth and result in absolute emission reduction by middle of this decade

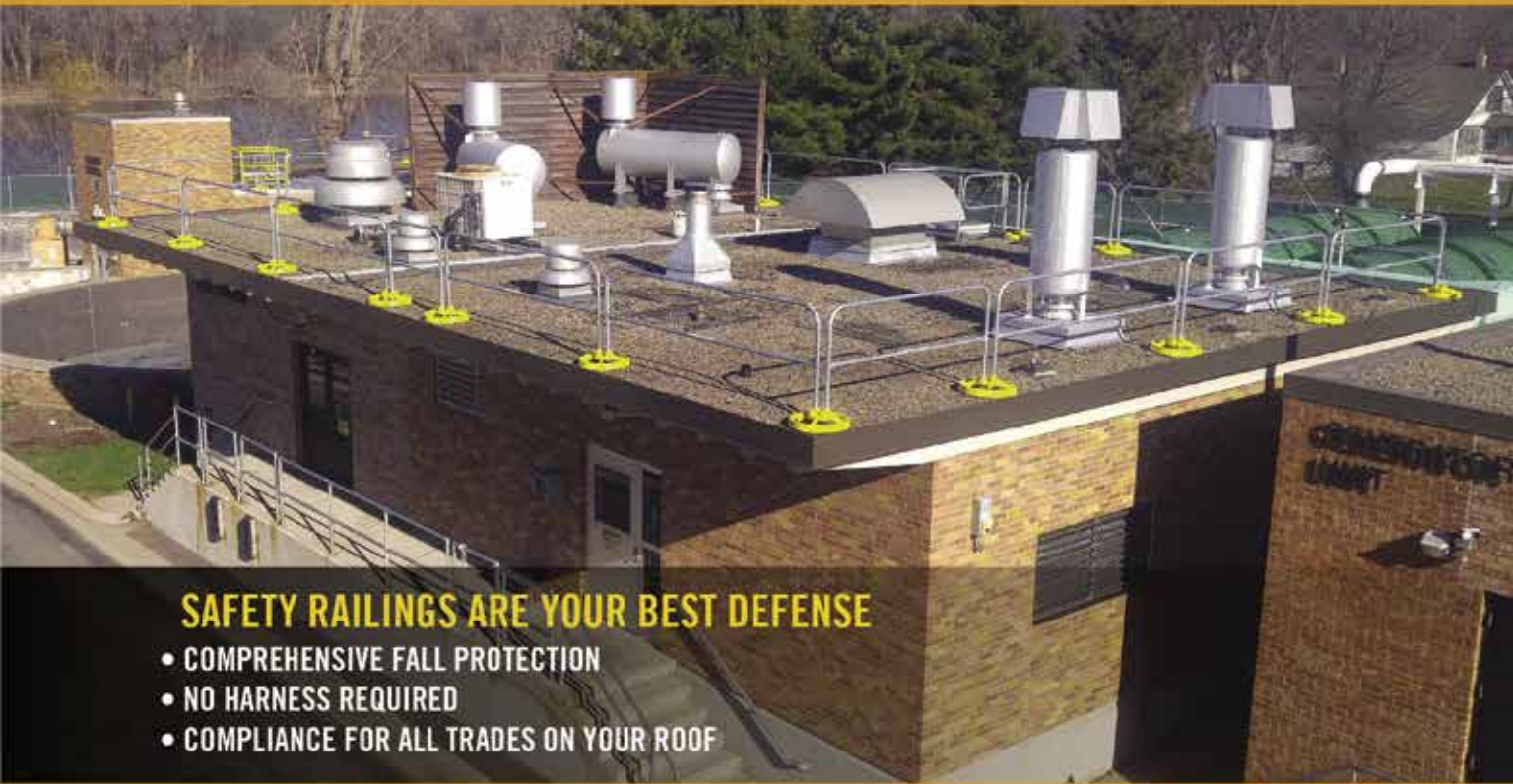
By the middle of this decade greenhouse gas (GHG) emissions from Canadian oil sands production should be in decline even as production continues to grow, according to a new comprehensive report by S&P Global Commodity Insights that takes into account current technology trends and production growth.

Entitled The Trajectory of Oil Sands GHG Emissions: 2009-2035, the report by the S&P Global Oil Sands Dialogue says that long-term trends of reductions to the GHG intensity of oil sands production are set to reach an inflection point around 2025. Immediate pressure on absolute emissions to rise is expected in the short-term prior to that point. Absolute emissions are then expected to begin to decline from a level between 87-89 MMtCO₂e, even as production rises by more than 600,000 barrels per day during the same period (2020 to 2025).

The findings of the report confirm a preliminary analysis from the same team released earlier this year. “GHG intensity improvements do add up,” said Kevin Birn, vice president, GHG estimation and coor-

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dination, S&P Global Commodity Insights. “Our latest analysis shows that, if existing trends continue, they will overtake pressure from a slowing growth profile leading to absolute emission declines within the next few years.”

From 2020 to 2035, S&P Global Commodity Insights projects GHG intensity of the Canadian oil sands could decline from 20-28% with some segments seeing much more dramatic reductions. Meanwhile, production growth in the study was projected to increase by more than 800,000 to 1.2 million barrels per day during this period. Most of that growth is expected to occur by 2025.

Efficiency improvements, including higher facility utilization rates as well as the roll-out and ramp-up of newer, less GHG-intensive operations have been leading contributors to past intensity reductions. These factors are expected to continue to play a role in future. However, carbon capture and storage as well as what S&P Global Commodity Insights is calling steam displacement technologies have the potential to result in more dramatic reductions.

“Although it can take time to be developed, carbon capture and storage is a wildcard when we look at technologies that can really make a difference for large industrial scale emitters like in the oil sands,” Birn said. “Another wild card is the increasing use of what we are calling steam displacements technologies in thermal oil sands operations. This category of technologies can materially reduce the steam, and thus emissions required to produce a barrel of oil.”

Steam displacement technologies physically re-

place steam required per barrel with solvents, or noncondensable gas like methane. These technologies can have large implications for oil sands thermal extraction emissions and can even result in increased productivity.

“We were struck by the some of the success of steam displacement technologies occurring in the field,” Birn said. “They show great potential to influence future oil sands GHG emissions and even enhance the level of future production.

“This new S&P Global Commodity Insights analysis is arguably the most rigorous examination of oil sands GHG emissions to date and the findings that, even if current trends continue, absolute emissions are set to decline within the next few years are profound,” Birn said. “This may yet prove to be a conservative estimate with both industry and governments in Canada vowing to take more material actions to lower the oil sands emissions profile and improve the long-term carbon competitiveness of the sector to better compete through the energy transition.”

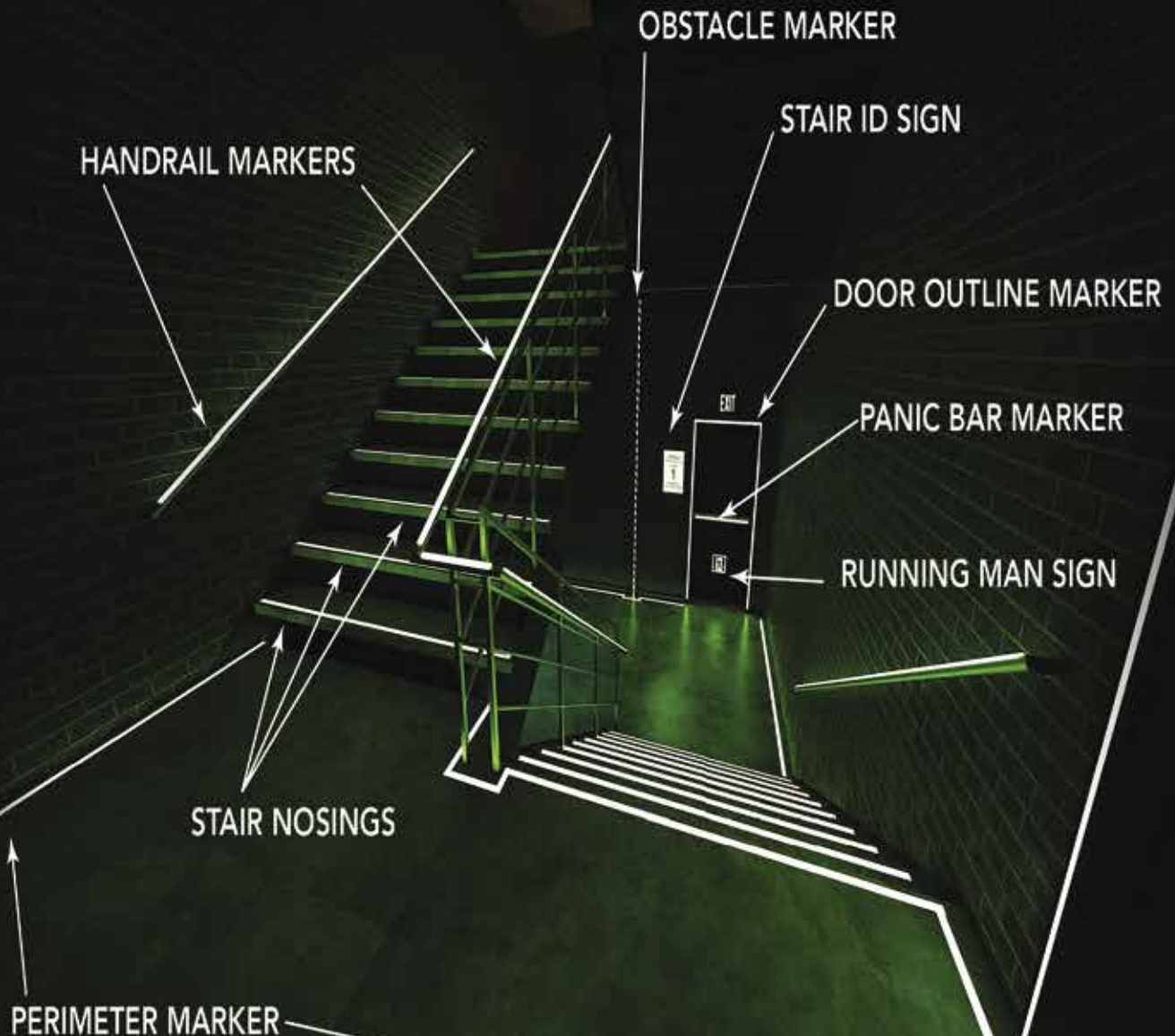
S&P Global Commodity Insights estimates that the announced ambition of Oil Sands Pathways to Netzero—a consortium of major oil sands producers representing more than 95% of industry output—could result in oil sands GHG emissions falling by 19 MtCO₂e by 2030 relative to 2020. That is 17 MMtCO₂e lower than S&P Global Commodity Insights projection for 2035. Recently the government of Canada announced it could be seeking even greater reductions from the sector.

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How to Improve Job Site Metrics with Wearables

Wearables have become a very fashionable topic in the construction industry, but it's not all window dressing, every day, wearables are promoting health, safety, connectivity, productivity and accuracy on construction sites.

An Accessory For Every Occasion

A number of employee monitoring systems have been introduced to the construction industry with the aim of making employees safer.

Dash cams are being installed into truck cabs—but not to record traffic—to record the activities of the driver. Truck companies want to make sure drivers are checking their mirrors and especially aren't using their phones when behind the wheel.

The Spot-R fall alert and emergency evacuation system from Triax Technologies monitors employees' movements to alert safety personnel if the device changes elevation quickly, indicating a fall. And it alerts workers of a emergency evacuation.

The Scan-Link RFID tags monitor employees' locations and alerts equipment operators of employees who are located behind the machine.

Some smart watches detect vibration; that technology is used to monitor the ramifications to the body from using power equipment for a long time. Alerts tell the end-user when power tool use exceeds what the body can safely perform, and this is to prevent hand-arm vibration syndrome (HAVS).

Smart helmets monitor several health elements, such as fatigue, heart rate and stress, so workers and management can modify worker's activities in ways that promote employee health and job site safety and productivity.

Turning Historical Data Into Predictive Analytics

A lot of times, this monitoring can lead to policy changes and coaching opportunities.

"One customer who uses our Scan-Link RFID technology reported to me the following story," says Jonathan Fava, president, Scan-Link Technologies, a CONEXPO-CON/AGG exhibitor. "We were looking at the number of times equipment operators were alerted to the presence of a nearby worker, and we noticed one person was causing a lot of alerts, so we pulled that individual aside and asked him why. He explained that he's the flagger

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so, when operators load the machine onto a float, he gets up on the float to aid the operator place the machine. We advised him that behavior is unsafe; he could get struck by the machine or fall off the float. So, we told him a safer way to perform his job and wrote down new safety protocols into our guidelines and training.”

Using historical data to learn how things happen is the first step to promoting safety on the job site. “It’s not enough just to learn how accidents have happened,” says Fava. “The next step is to analyze data in order to prevent accidents from happening.

With all of the employee detections picked up by the Scan-Link system, managers can identify “hot spots”—spots where machines detect people the most frequently.

“Using this data, customers can identify areas where a struck-by incident is most likely to occur. Then, customers can make decisions that will decrease the risk of an accident from happening by moving the location of materials, so workers don’t have to walk in a machine’s workspace or by putting up signage warning employees of high-risk areas,” says Fava.

Assisted Reality Connects Two Physical Worlds

Wearables are also instrumental in merging realities, which is bringing connectivity, productivity and accuracy to job sites.

Exoskeleton and assisted reality headset manufacturer Real Wear just released the second version of their assisted reality headset, called the RealWear Navigator 500.

It is sleeker, lighter and is more ergonomic than the previous model (the HMT100) for all-day comfort yet is rugged and durable for use on construction sites and in industrial settings.

It features a modular design, a 48-megapixel camera sensor with enhanced zoom capability, incredible low light performance, and is compatible with more than 200 optimized apps. A hot-swappable battery allows for continuous use the whole day.

“With the Navigator 500, we wanted to provide scale enterprise solutions as part of the digital transformation movement. Today, we see the acceleration of digital transformation on the future of work, especially since the pandemic,” says Andrew Chrostowski, chairman and CEO, RealWear Technologies. “Our device is hands free and keeps you present. You don’t want your head stuck in the meta verse when you’re working around heavy equipment.”

The device allows the user to take photo and video at six different zoom levels, as well as call someone. The device takes audio commands for all features; you say the words “take a picture” or “zoom” or “call Herald” and it does it, so you can keep your hands on what you’re doing.

With it, users can aid in remote inspections and diagnostics. By equipping someone at the job site with the Navigator 500, they can act as the eyes for inspectors and technicians, so inspections and troubleshooting equipment can be done remotely, saving time and travel costs.

Augmented Reality Expands By Becoming Handheld

The Trimble XR10 with Microsoft HoloLens brings a different kind of connectivity and reality. The technology connects virtual reality to physical reality to provide mixed reality.

HoloLens users can see both the physical world and the virtual world; the digital image is overlaid onto the physical world.

This technology is especially handy to trades; now, they no longer need to look at paper designs for what they are installing and then try to map out

where that is in the physical world by establishing a frame of reference and taking out the measuring tape; they can simply see, for example, the virtual pipes and their detailed measurements, and install the pipes with high accuracy. They can also see what is being installed nearby, so they can identify potential complications.

Trimble, a featured exhibitor at CONEXPO-CON/AGG, recently expanded the potential for BIM (business information modeling) users to deploy augmented reality on the job site by introducing the Trimble Connect AR app, which is compatible with Trimble Connect. The app is downloaded to a phone or tablet and allows users an augmented reality experience by pushing BIM data to their phone and overlaying it onto images of the real world on the device's screen.

This eliminates what can be a costly financial barrier to some customers," says Martin Holmgren, general manager of building field solutions at Trimble. "And users can interact with Trimble

Connect AR users in the digital space. For example, I can leave a message in the digital space with my Trimble XR10 and someone with the Trimble Connect AR app on their phone can detect the message, even weeks later as they walk by the location where it was left and read it. This greatly enhances communications and streamlines workflows."

Trimble expects people who don't need to be fully hands-free, such as supervisors, managers, inspectors, and building owners will use it to perform tasks, such as QA/QC, updating punch lists, and measuring construction progress.

"The app allows for the incorporation of AR into workflows that don't require the user to be hands-free, and we think our app will ultimately drive AR in a much wider range of adoption," says Holmgren.

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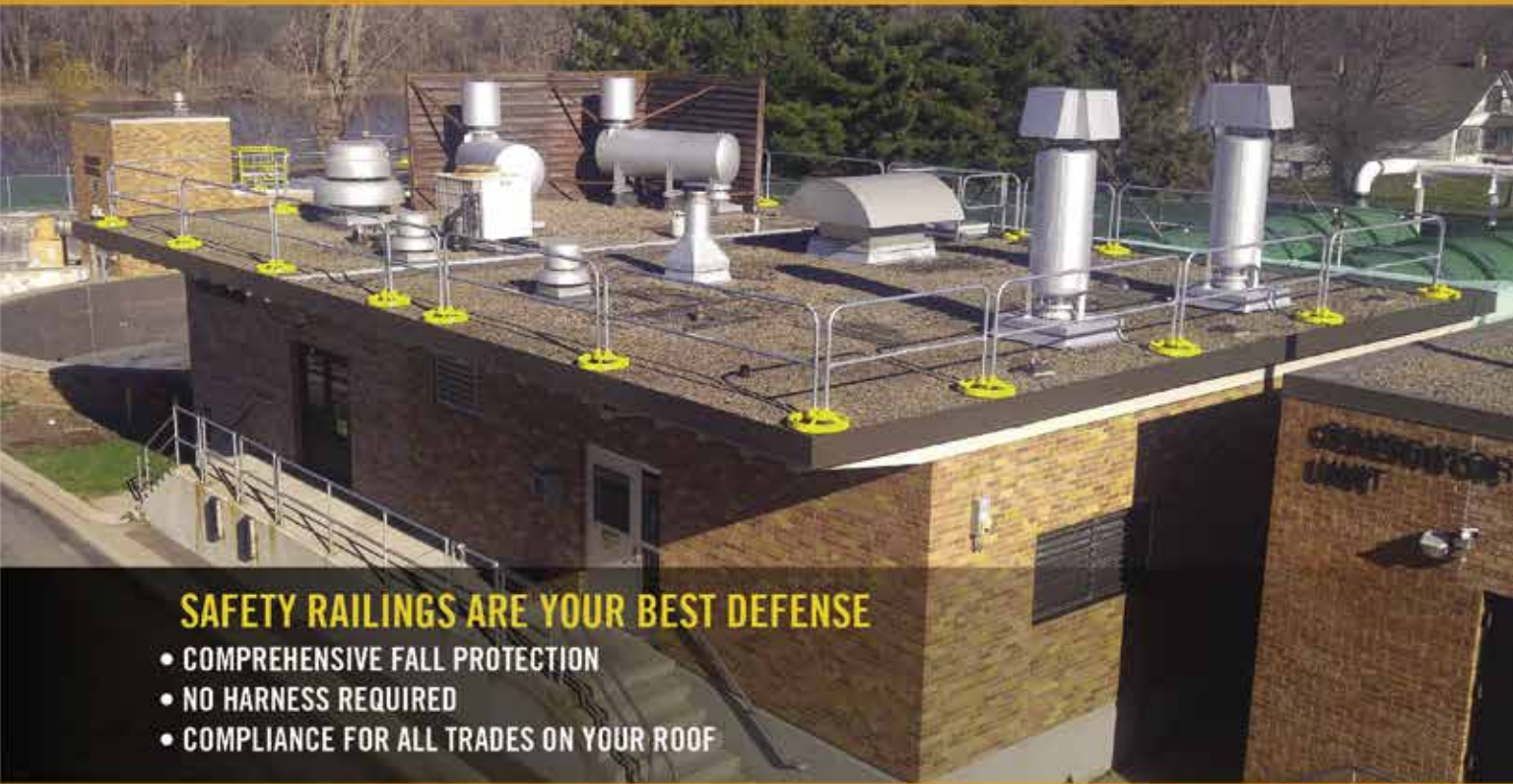
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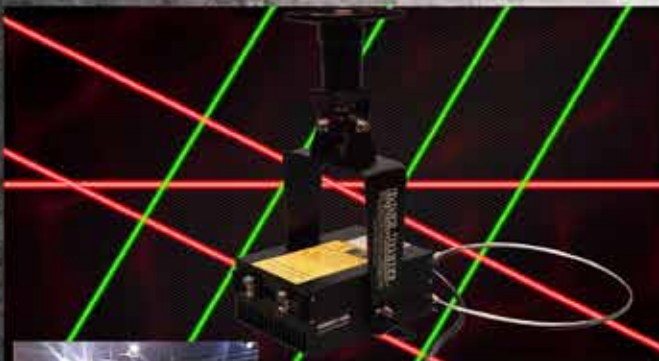


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