

Moo-ving Forward!

Mary Ellen Doran, AGMA Vice President, Emerging Technology

I've always been a planner, and a new calendar feels like a blank slate of possibilities. 2025 promises an exciting year for AGMA Emerging Technology, with a packed schedule of programs. We began the year with a webinar featuring Noel Mack, CTO of LIFT: The National Advanced Materials and Manufacturing Institute. If you missed it, it is available on-demand on the AGMA website. Alongside committee meetings, we'll host eleven webinars (first Wednesdays) and live presentations at key AGMA events, including the Annual Meeting, SNL, and the Motion + Power Technology Expo.

This year, I had the opportunity to kick off my work at the Consumer Electronic Show (CES) in Las Vegas. It's a great way to preview trends shaping the year ahead. It also prompts me to find unexpected connections with new technologies. While I was there, a colleague asked me to name three things I'm keeping an eye in 2025. It was a casual question that led to an interesting reflection. My response: "Cybersecurity around AI, mechanical advancements for serial production of humanoid robots, and cow burps."

Cybersecurity remains a critical topic in manufacturing. As we saw in James McQuiggan's webinar presentation last June (still available on-demand) social engineering was the #1 root cause of hacking and malware. Phishing tactics are growing harder to catch. Akamai noted, "We see 61 billion credential stuffing attacks in 18 months." I am watching to see how multi-factor authentication changes and find new strategies for training employees to keep information safe.

On the humanoid robot front, 2024 saw impressive progress and record-breaking investment. At the start of the year, prototypes were expected to be years away, but by mid-year, we saw prototypes performing complex tasks. By year's end, robots

were in industrial plants, with broader deployment accelerating. While the scientists will continue to teach the AI models, the challenge for AGMA members lies in helping to scale up production—from a \$200,000 per unit prototype to a mass-produced unit costing \$15,000-\$20,000. I'm particularly interested in innovations to lightweight and reduce costs in actuators and gearboxes. With our experience in manufacturing engines and components for millions of cars annually, we have a clear pathway for scaling up the mechanical aspects of these robots. I saw some new solutions in the Schaeffler booth at CES that hold real promise, and I look forward to watching this space and bringing you information as others bring their ideas to market.

Now "cow burp" probably was not an expected answer. I can tell you that it was not on my shortlist in early December. But then I received the MIT Technology Review's 10 Breakthrough Technologies 2025 edition. Number four on their list is: Cattle burping remedies. The article highlights products making "real progress on one of the trickiest problems for climate change." The article states that, depending on the analysis, livestock emissions can contribute 11 percent to 20 percent of the world's total pollution. This new product is said to cut emissions by 30 percent. How is this applicable to the gear industry? I see everything as interwoven. Recent moves in the EV market stem partly from the need to reduce pollution. Should this livestock feed provide significant improvements in that sector—what are the ramifications for vehicles? Will this lead to the changing of some public policies? Will the research aid in the pursuit of bio-fuels? I just want to watch this space in 2025 to see how it folds into the overall picture.

As always, I encourage you to join in our activities. AGMA has four committees discussing 3D printing technologies, AI and related IIoT topics, electric vehicle technology, and robotics. Keep an eye out for more interesting posts on LinkedIn, and register for an event.

