Next-Generation Transmission Technology

Preston Moore

What is Electric Variable Transmission (EVT)?

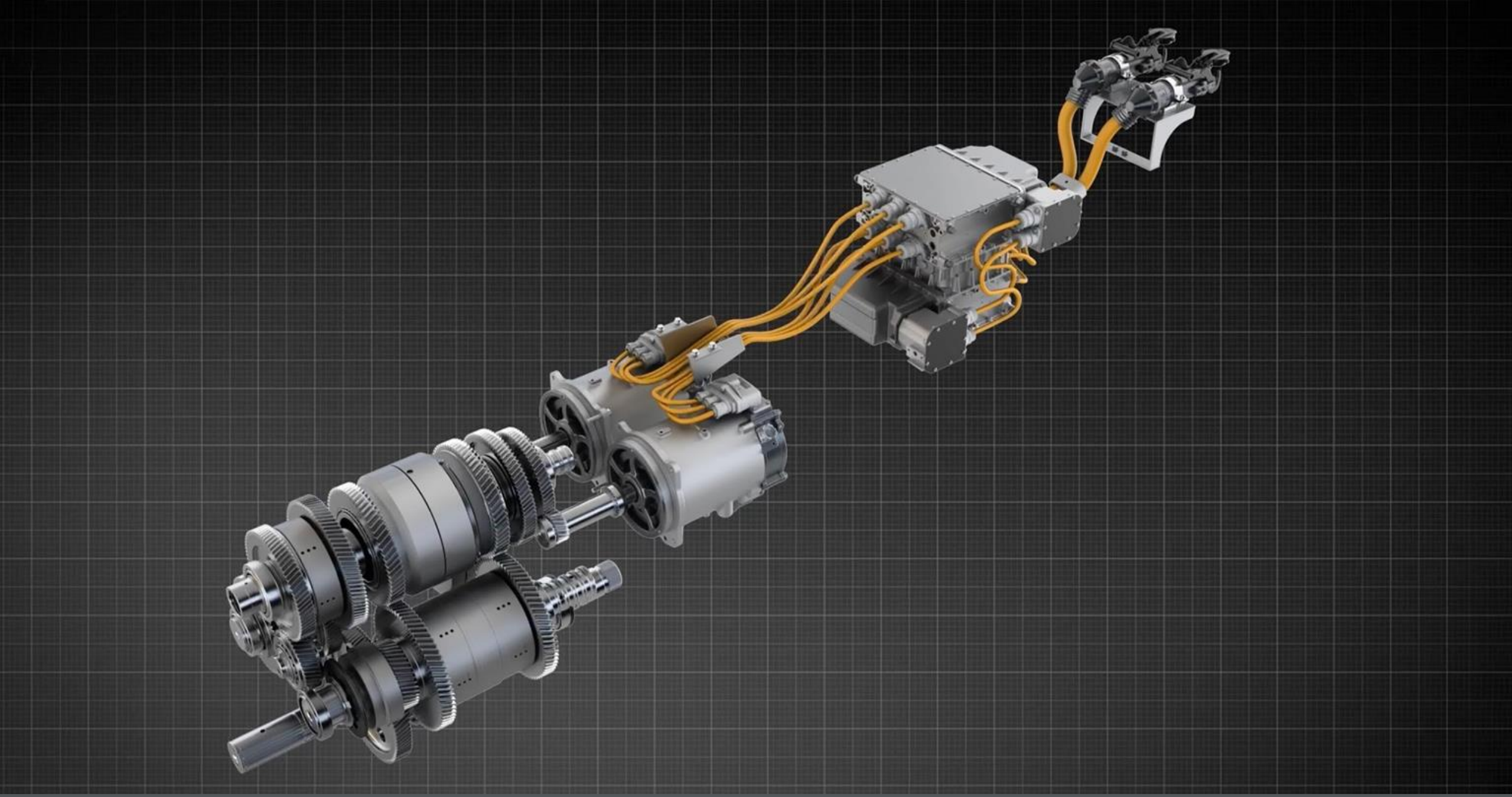
Electric Variable Transmission (EVT)

Primary function of the EVT is to work as a power split transmission.

- Provides inherent overload protection while dampening vibrations for a smoother ride.

Drivetrain that utilizes EVT is considered a hybrid drivetrain.

New John Deere EVT builds on the foundation of John Deere Infinitely Variable Transmission (IVT).



New Electric Variable Transmission (EVT)

EVT available for all 410-hp 8 Series tractors, including 8R, 8RT, and 8RX models.

Features a stepless transmission design.

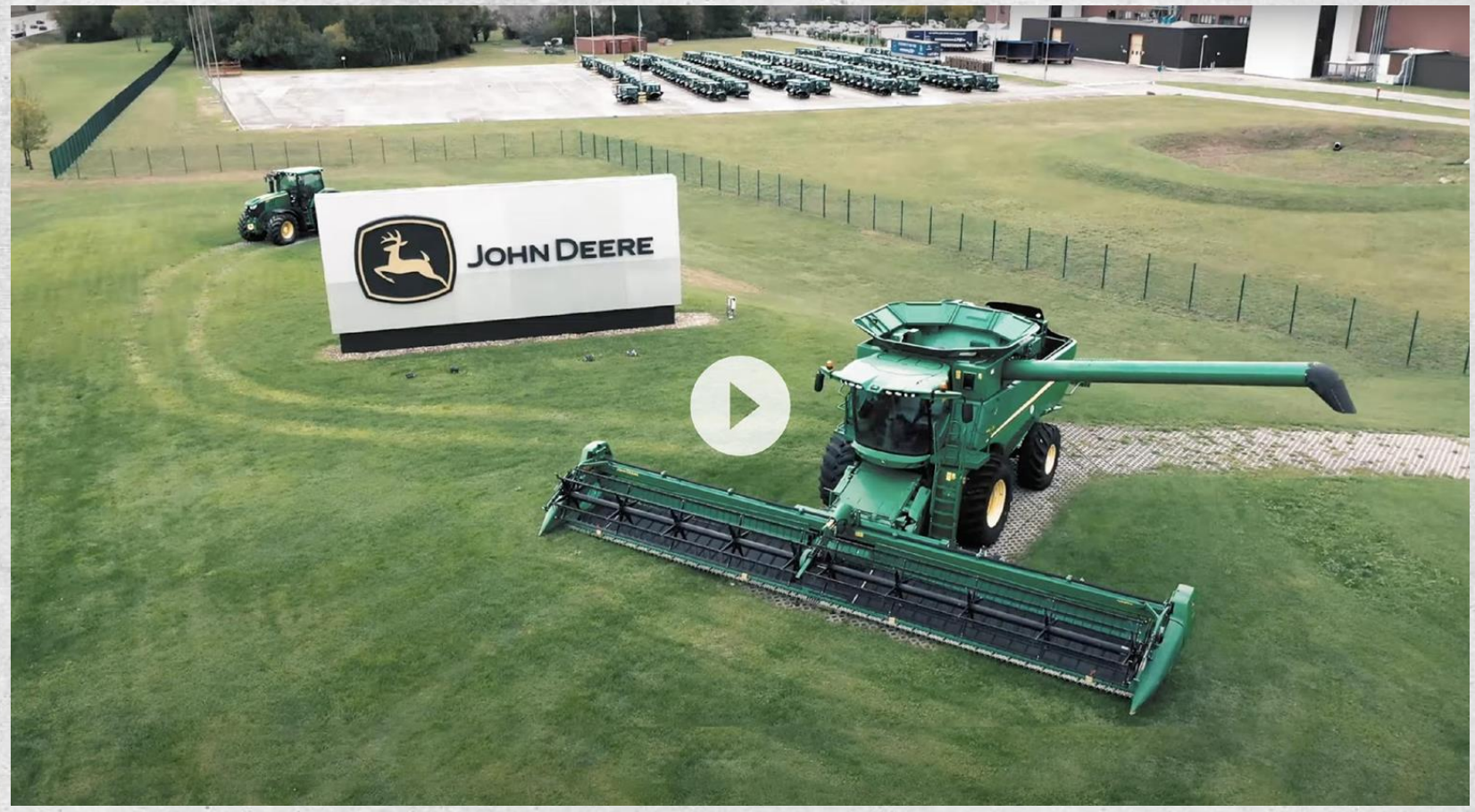
- Offers infinite speed control and faster acceleration.

Electric motors replacing hydrostatic motors.

Delivers improved performance and control.

- Reliable
- Efficient
- Quieter than other transmissions

Available with optional CommandPRO™ Control.



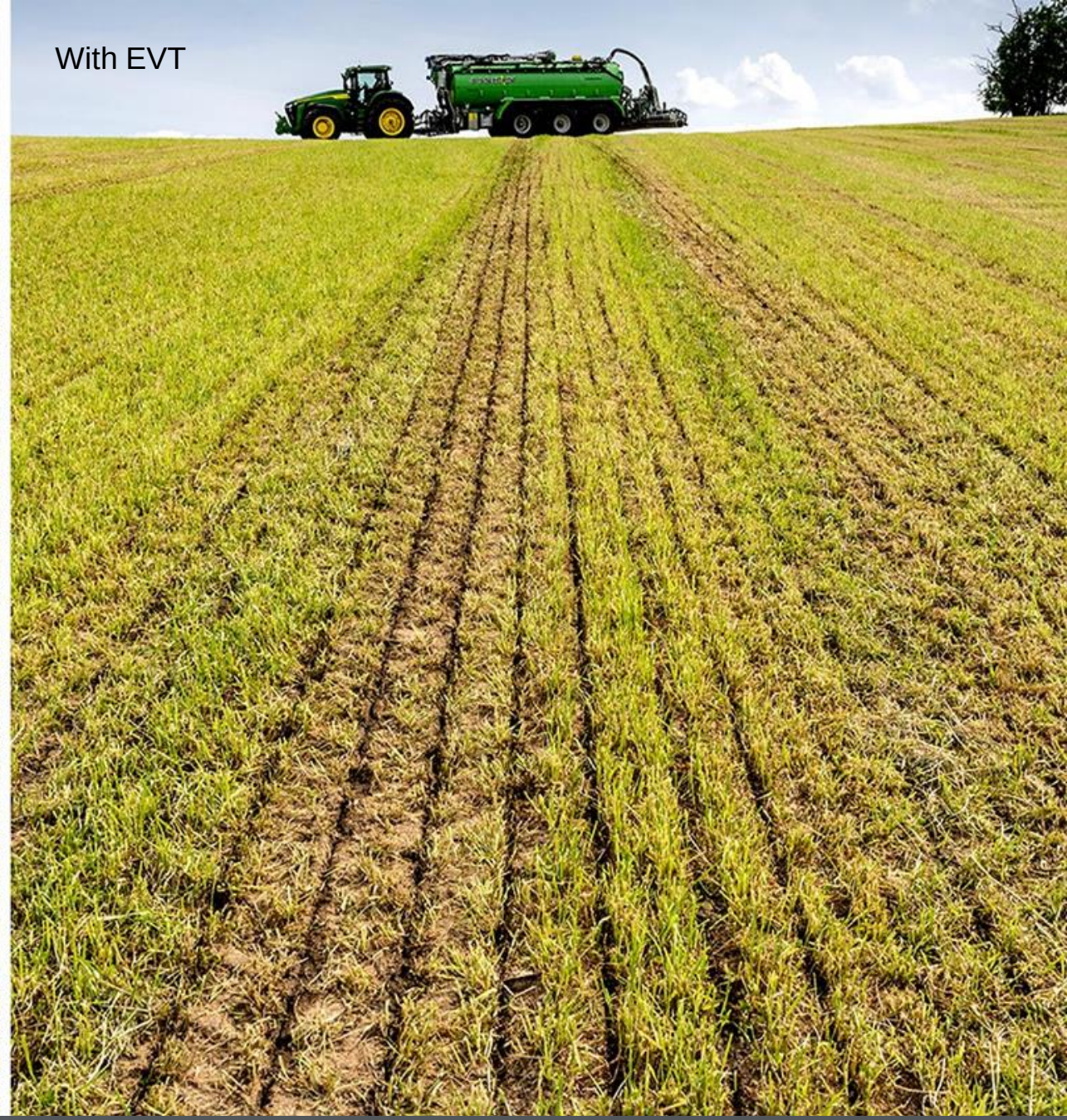
John Deere & Joskin and the eAutoPower gearbox e8WD for 8R large tractors:
https://www.youtube.com/watch?app=desktop&v=kEj6_m5WtbQ

John Deere and Joskin

The new EVT developed from a John Deere project with Joskin.

New electrification solution that enhances maneuverability and enables new technologies to be utilized on agricultural equipment like tractors and slurry spreaders.

Developed eAutoPowr transmission that utilizes two high-power electric machines, instead of the conventional hydrostatic unit, to achieve the required gear ratio.



Why use electric motors in place of hydrostatics? Isn’t that more added cost?

Benefits

Precision speed control and smoother performance:

- Infinite speed control from 0.03–31 mph on wheel models.
- Quick acceleration.

Less operating noise.

Improved reliability, efficiency, and fuel economy.

Benefits of inverter electronic control:

- Refined speed control.
- Ability to offboard power to another implement.
- Improved traction and reduced wheel slip.
- Less tire wear.
- Less wheel slip translates to less disturbance to the soil, less tear-up to any crop or grass and a decreased footprint left behind from the tractor.
- Enables improved uphill performance.
- Ability to pull wider implements without the need for extra ballast or larger horsepower tractor.

Benefits

The industry’s only transmission enabling electric power generation up to 100kW (136hp).

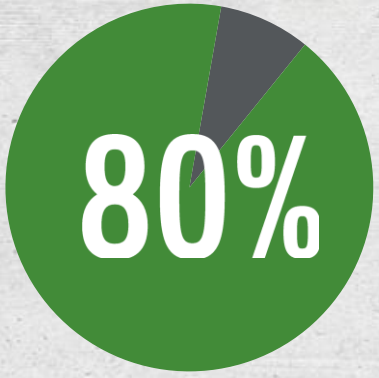
- Farmers could use this electricity to power implement fan drives, take the place of implement hydraulic pumps, or assist the tractor by powering the implement's axles.
- This is similar to proven technology John Deere currently uses on construction equipment.

Maintains efficient power transfer from the engine to the drawbar for low fluid consumption and excellent pulling performance.

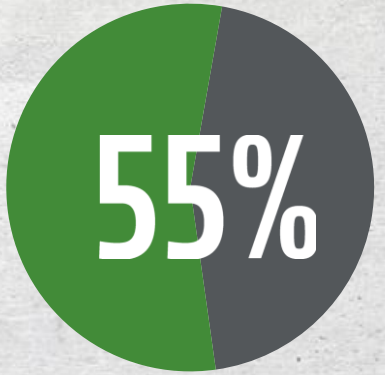
Operators who select EVT will also experience a noticeable reduction in drivetrain noise due to the quiet nature of electric drive components.

Joskin application

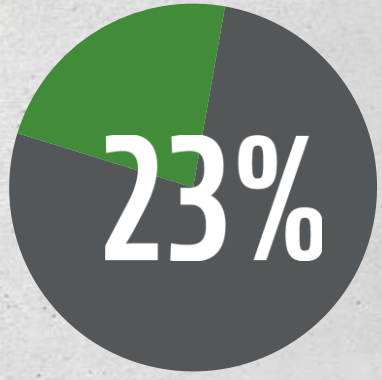
20-45%
INCREASED PRODUCTIVITY
WHILE OPERATING AT
20-30%
LOWER COSTS



Power transferred from engine to drawbar



Reduction in diagnostics requiring tools or a technician



Reduction in drivetrain noise


“Where and when can I get it?”
— Real operator feedback

What does this mean for the future?

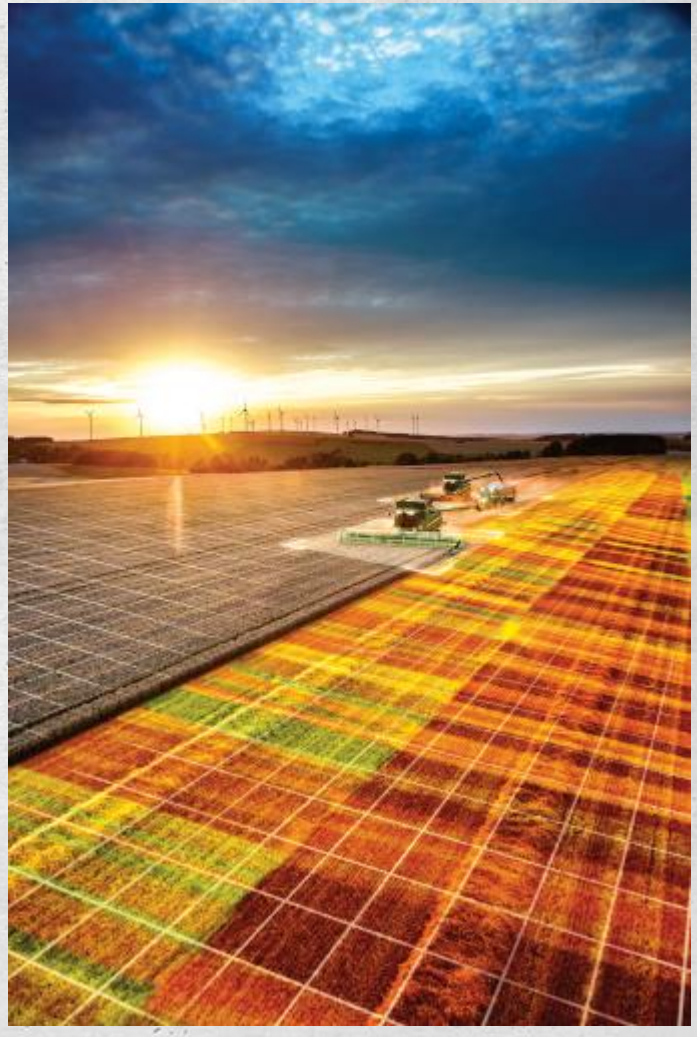
Transforming the industry

As agricultural producers look to the future, the EVT will likely be the transmission of choice for customers going forward.

Farmers can move forward with confidence knowing that the EVT can help them boost efficiency and productivity.

With power offboarding enabled, the possibilities to use this power on implements begin to blossom.

But that’s not all …

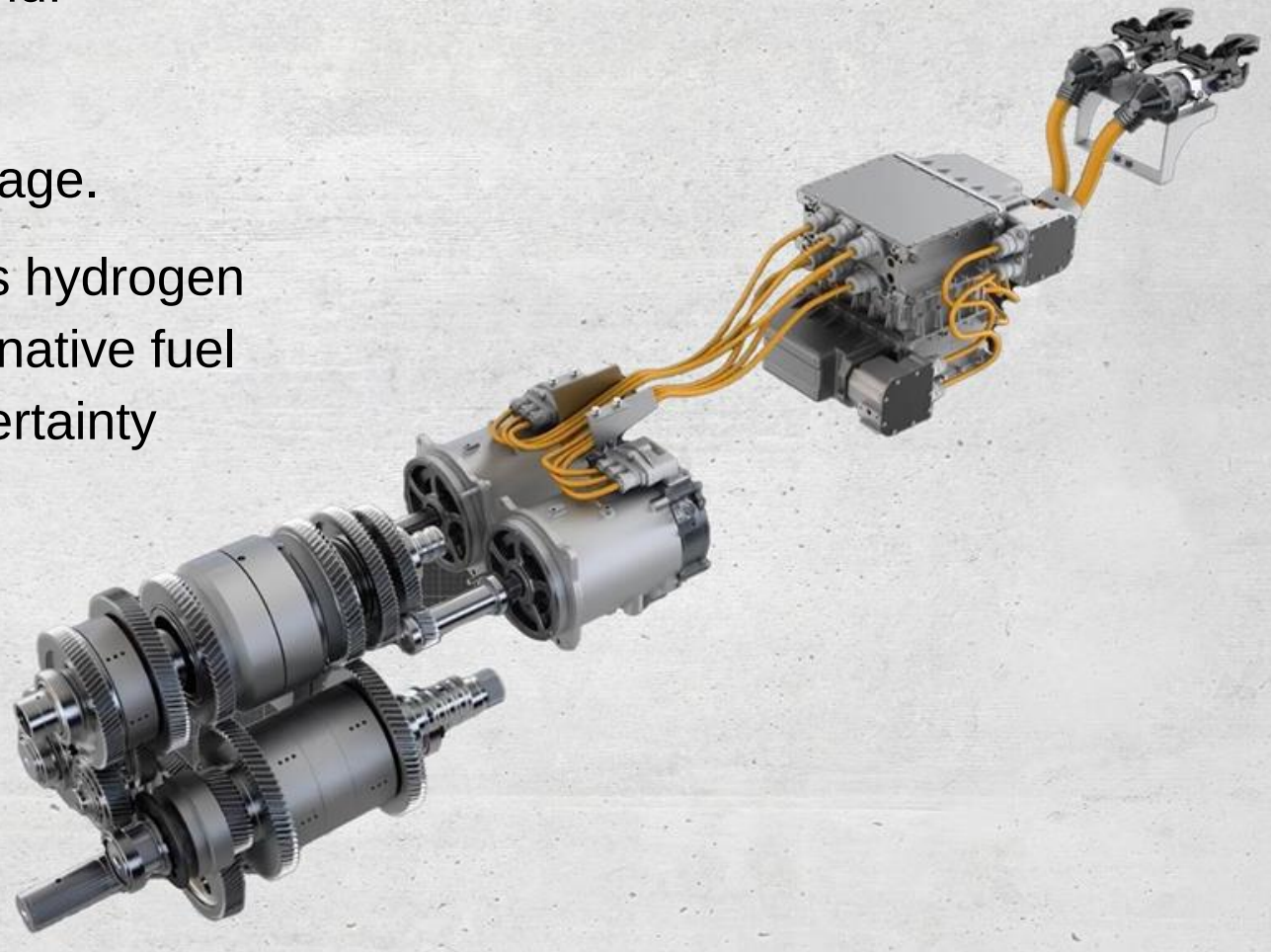


Setting the stage for the future

Sets the stage for an easy transition to hybrid:

- On-board energy storage.
- Optimized battery heavy equipment usage.

Optimized transmission design that benefits hydrogen engines, spark ignited engines, or any alternative fuel engine that can turn a shaft, mitigating uncertainty around preferred low-carbon fuel sources.




JOHN DEERE