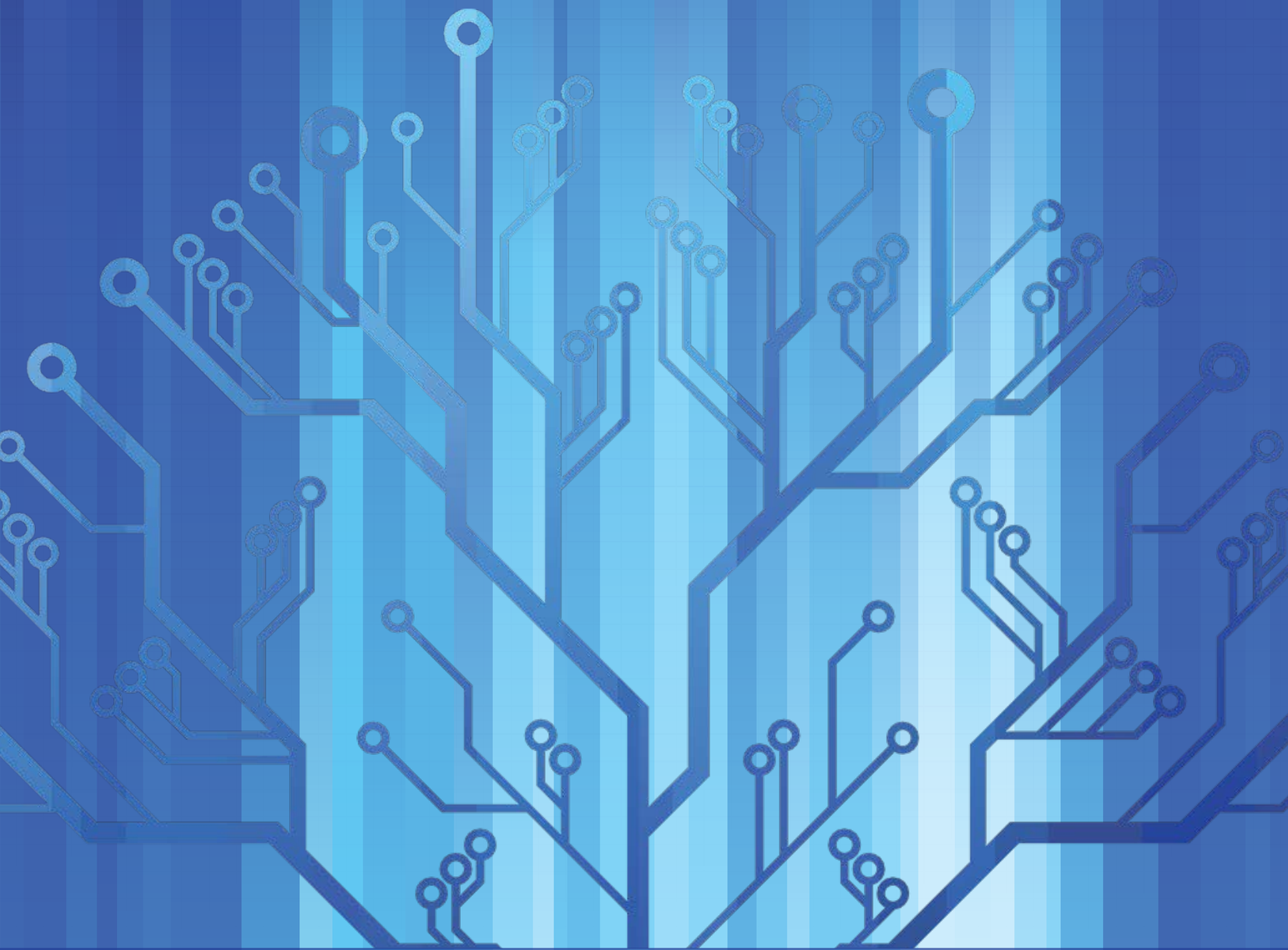
THE POWER BEHIND
THE POWER AHEAD



e-Mobility Solutions for Off-Highway

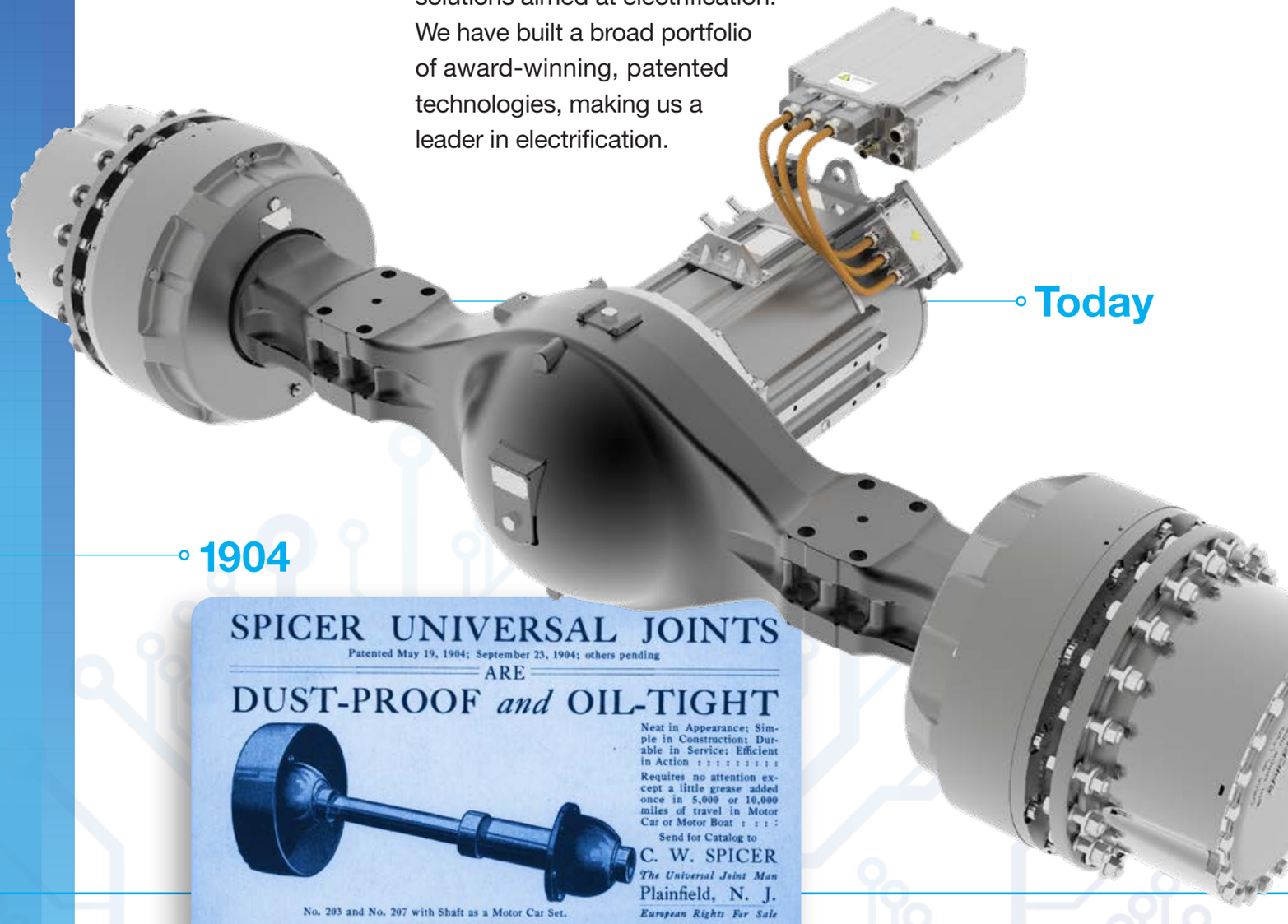
DANA | SPICER® ELECTRIFIED | BREVINI® ELECTRIFIED

Where there is a need …
Dana finds a better way.

A new era of mobility is upon us. Emissions regulations and government policies are manifesting at an ever-increasing pace, and visions of vehicles that reduce operating costs while enhancing productivity and safety are accelerating the need for alternative propulsion solutions.

For over 20 years, our group of highly focused engineers has been dedicated to research and development of new technology solutions aimed at electrification. We have built a broad portfolio of award-winning, patented technologies, making us a leader in electrification.

Today we can proudly say that we are the ONLY supplier with the capability to help manufacturers bring electric-driven vehicles to market through our collaborative, systems-oriented approach; decades of expertise; and broad selection of proven drive and motion capabilities for electrified vehicles.



Today

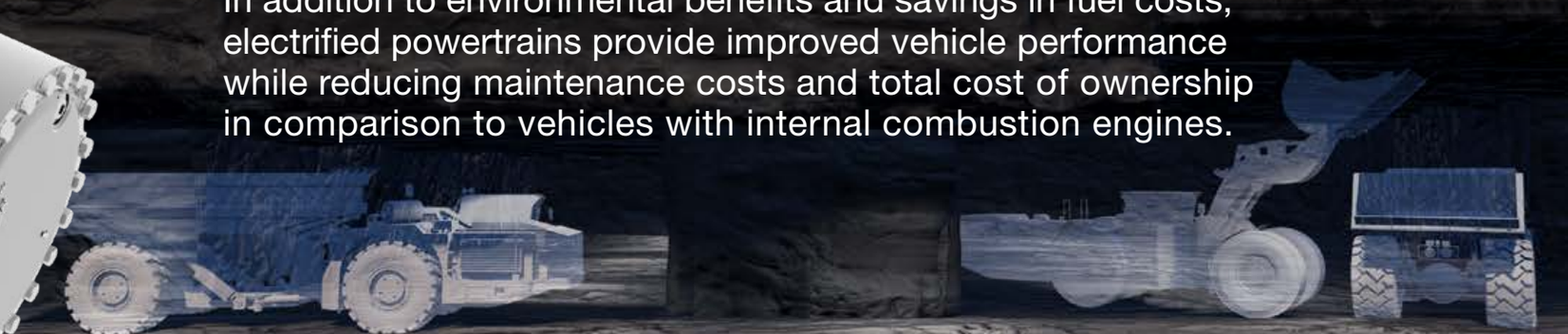
1904

Material Handling Vehicles

Compact Construction Vehicles

Why should we embrace electrification?

In addition to environmental benefits and savings in fuel costs, electrified powertrains provide improved vehicle performance while reducing maintenance costs and total cost of ownership in comparison to vehicles with internal combustion engines.



Surface and Underground Mining Vehicles

Why should you rely on Dana?

Solutions designed, engineered, and manufactured for maximum efficiency …

We approach electrification with a trained eye and an insightful, innovative perspective, utilizing market synergies to provide an advantage in electrifying offerings across multiple applications.

A component is only as good as the system in which it operates. That's why we take a systems-focused approach, seamlessly integrating our Dana components into complete electrified systems.

This in-house knowledge and integration produces solutions that provide enhanced performance, packaging optimization, and reduced system weight. All of which results in savings to your bottom line.

OFF–HIGHWAY VEHICLE (OHV)

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LIGHT VEHICLE (LV)

COMMERCIAL VEHICLE (CV)

WEIGHT REDUCTION
For additional payload or battery capacity

EFFICIENCY
Reduced energy consumption means increased range and cost-savings

PACKAGING
Improved vehicle integration for optimized packaging space

COOLING SOLUTIONS
Capability to integrate thermal-management solutions into the power source

… anywhere around the world.

Our global presence, combined with our localized logistics capabilities, allows us to meet region-specific electrification and production needs anywhere in the world.

- Present in 33 countries
- 145 major facilities
- 25 global technology centers
- More than 36,000 employees

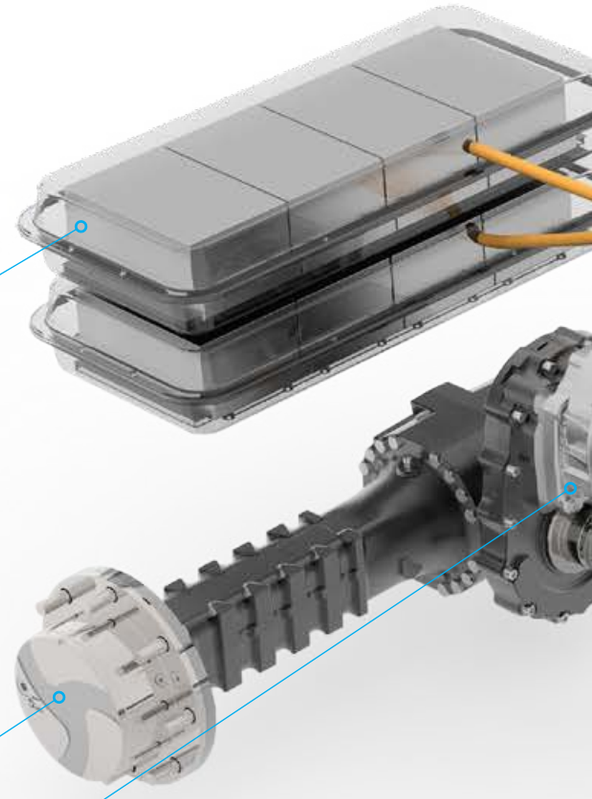
We ship to 10,000+ customers in 140+ countries.

We are **everywhere** our customers are.

Moving from conventional ... to electric.

How is an electrified powertrain different?

Considering the impact of the transition from the internal combustion engine to the electric motor, it is important to have a basic understanding of how electrified propulsion systems work.



BATTERY PACK

Stores electricity for use by the electric traction motor.

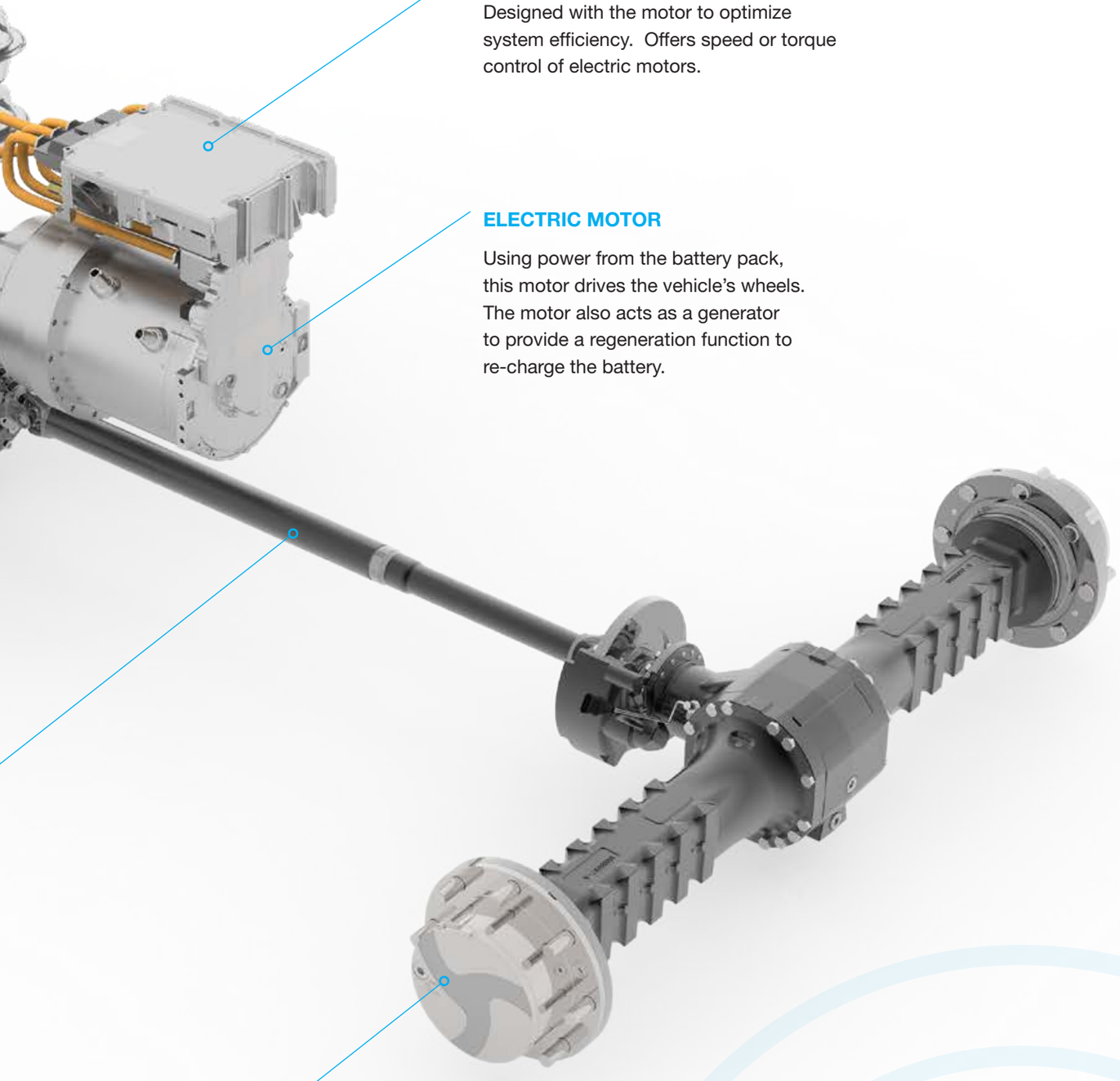
REAR AXLE

E-GEARBOX

The motor is matched to a gearbox which then powers a driveshaft and axle.

DRIVESHAFT

Dana-provided components highlighted in blue.



INVERTER

Designed with the motor to optimize system efficiency. Offers speed or torque control of electric motors.

ELECTRIC MOTOR

Using power from the battery pack, this motor drives the vehicle's wheels. The motor also acts as a generator to provide a regeneration function to re-charge the battery.

FRONT AXLE

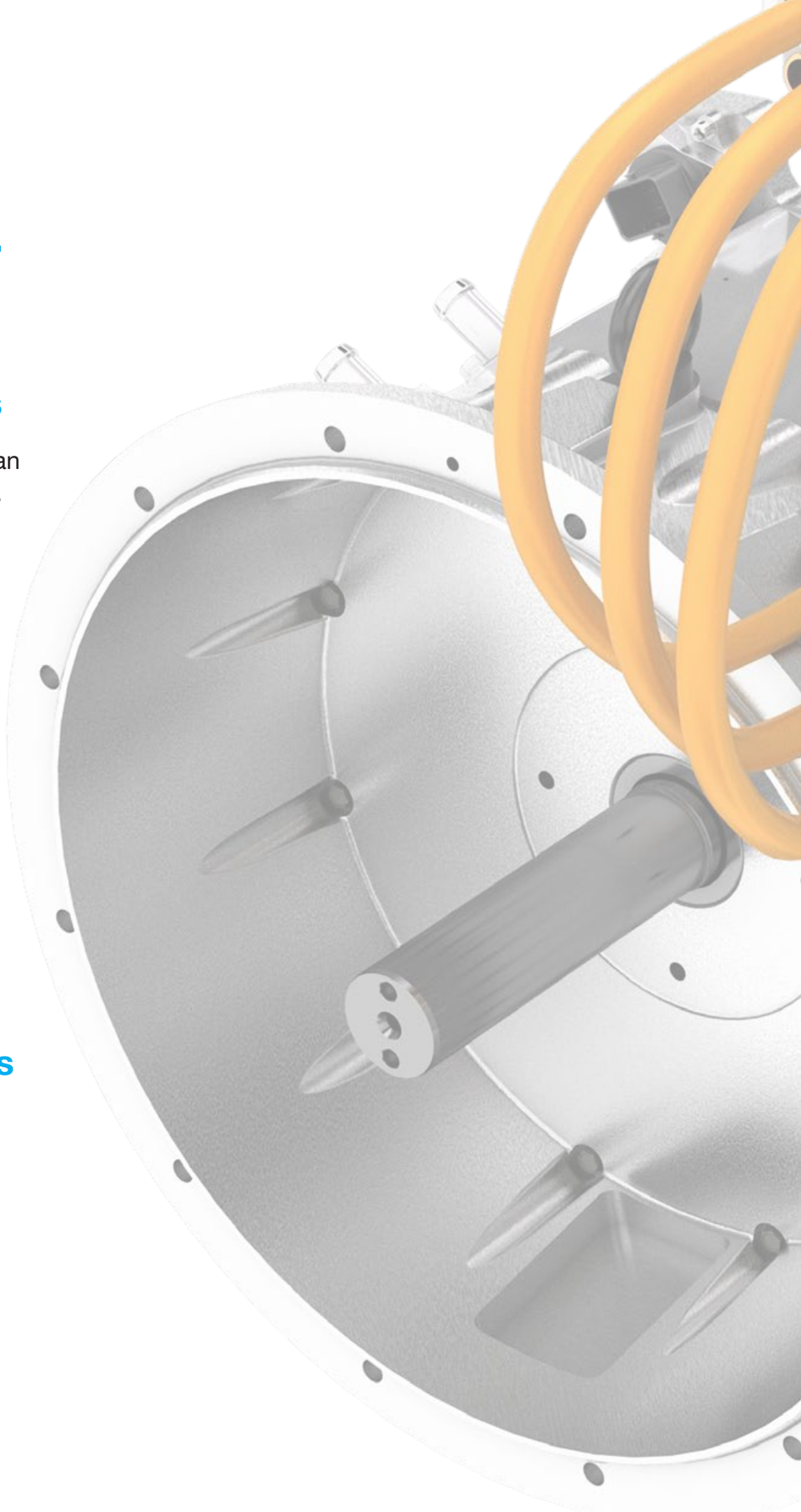
Powertrain architectures
for today and tomorrow.

Supported by a legacy of innovation in conventional drivetrains, Dana is at the forefront of integrating mechanical and electrical components for alternative propulsion applications. We have the right products to meet any OEM's need wherever they are in their electrification development.

And with multiple electrified products already in production, we're a step ahead – ready to serve your electrification needs now!

From hybrids to battery electric vehicles, we continue to focus on what we do best – transferring energy to the wheels and working functions as efficiently as possible.

Electrification
is Progressing.



Hybrid Electric Vehicles

Hybrid electric vehicles (HEVs) use an internal combustion engine in series or parallel with an electric motor for propulsion.

- Improved fuel economy
- Reduced emissions
- Fewer batteries required for operation
- On-board charger and internal combustion engine provides power when the battery cannot
- No additional infrastructure required
- Extended range vs. BEV

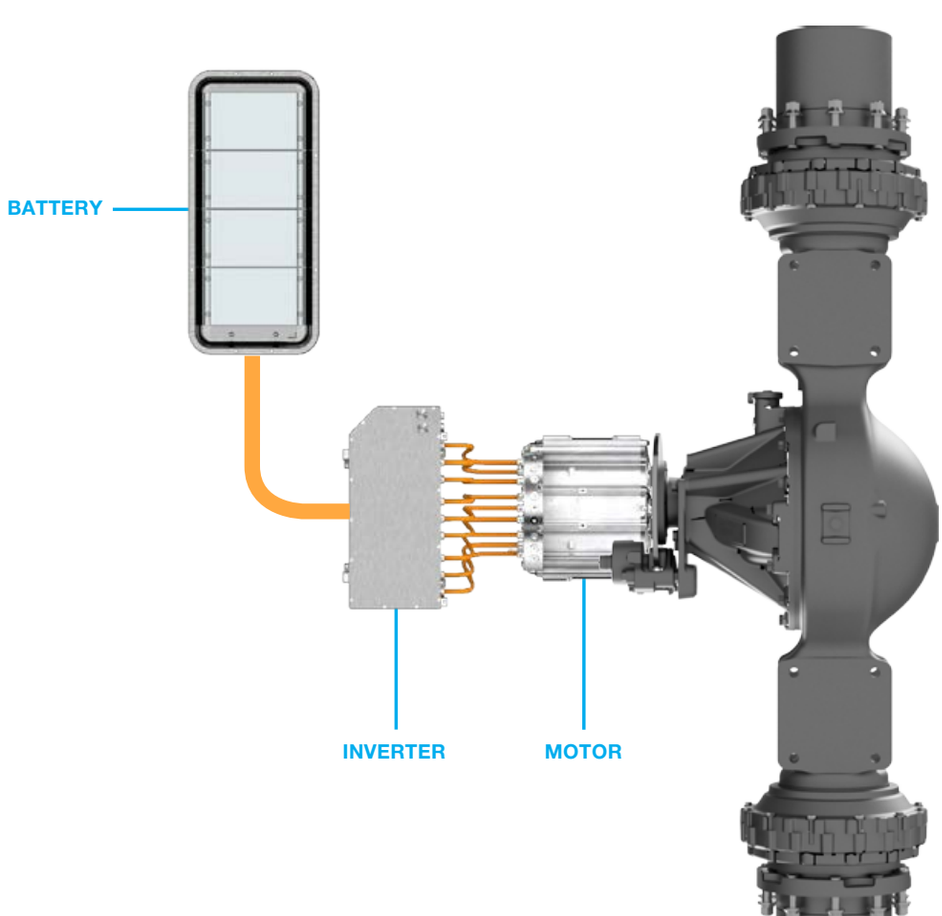
Battery Electric Vehicles

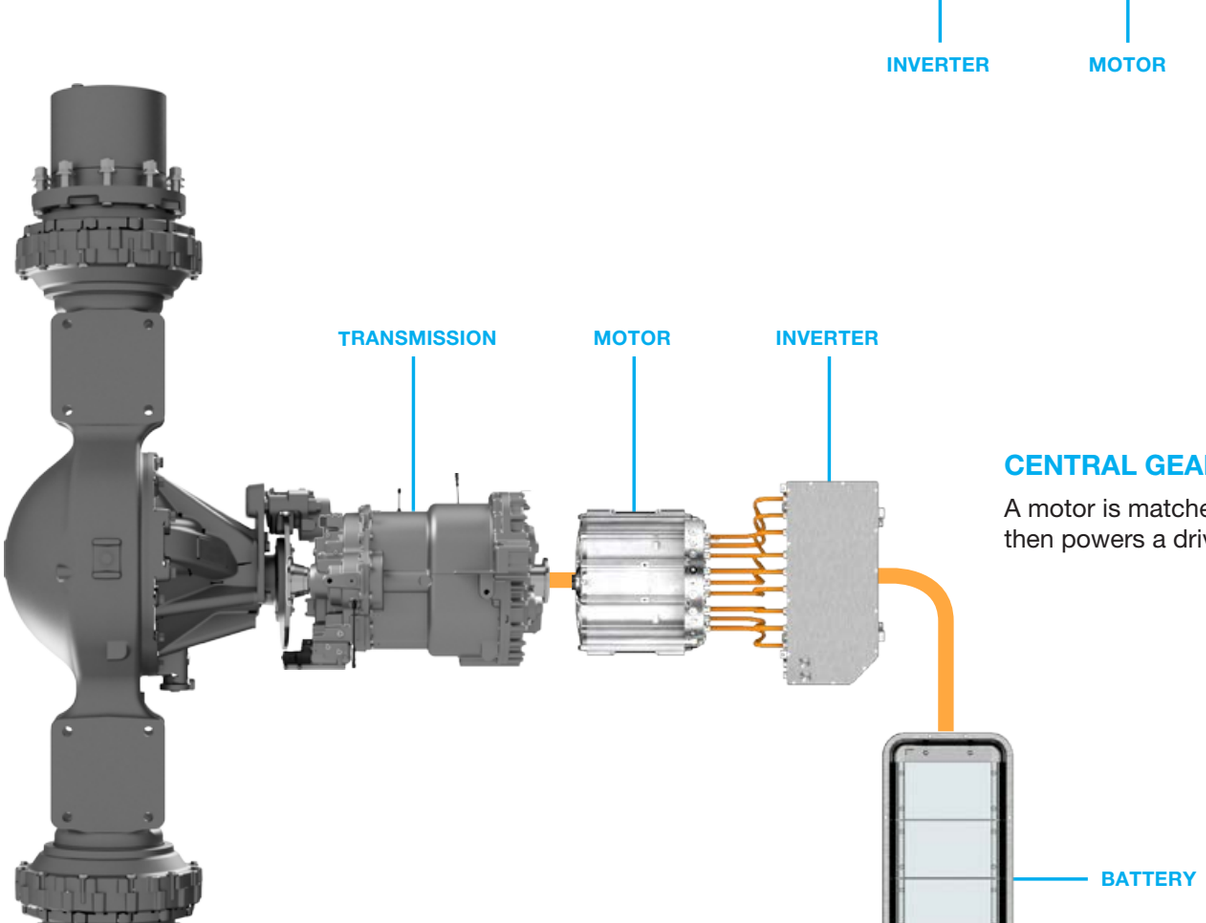
Battery electric vehicles (BEVs) use energy stored in rechargeable battery packs to power electric motors and controllers for propulsion.

- Zero fuel costs
- Zero emissions
- Simplified propulsion system for increased efficiency
- Increased reliability and reduced maintenance costs

CENTRAL DIRECT DRIVE SYSTEM

A motor is used to power the driveshaft and axle to propel the vehicle.





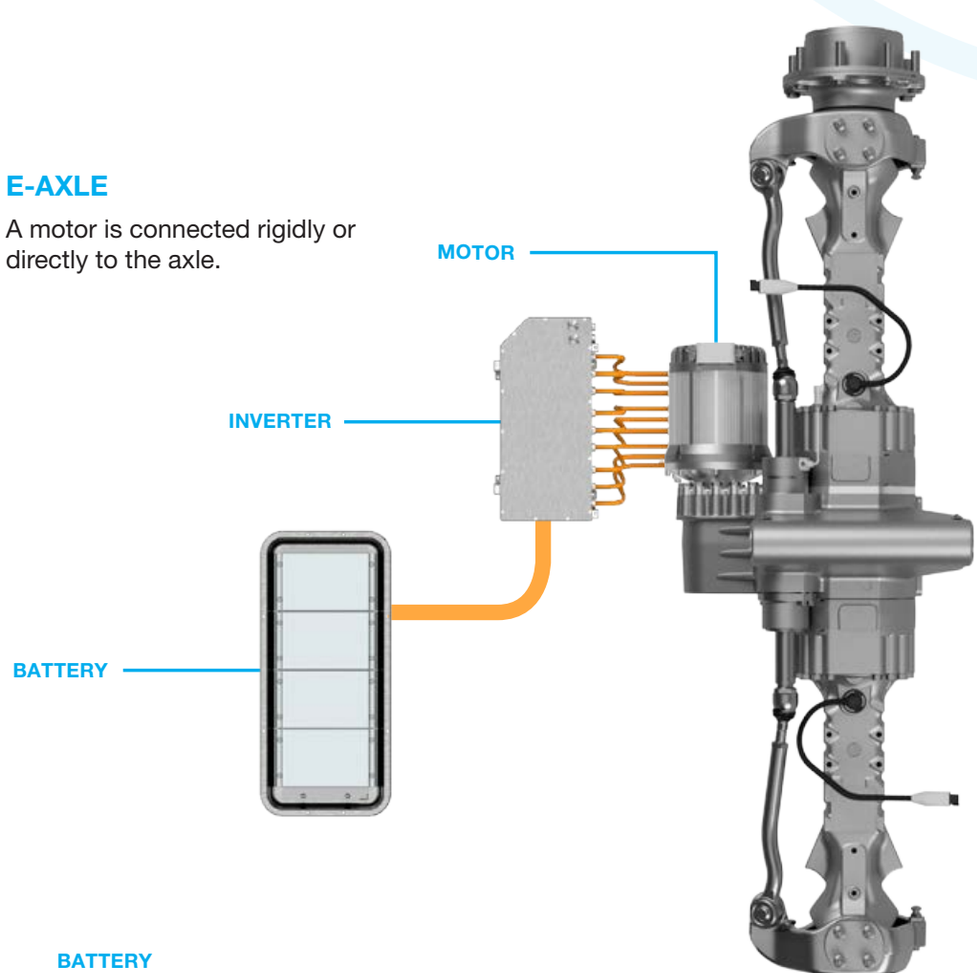
CENTRAL GEARED SYSTEM

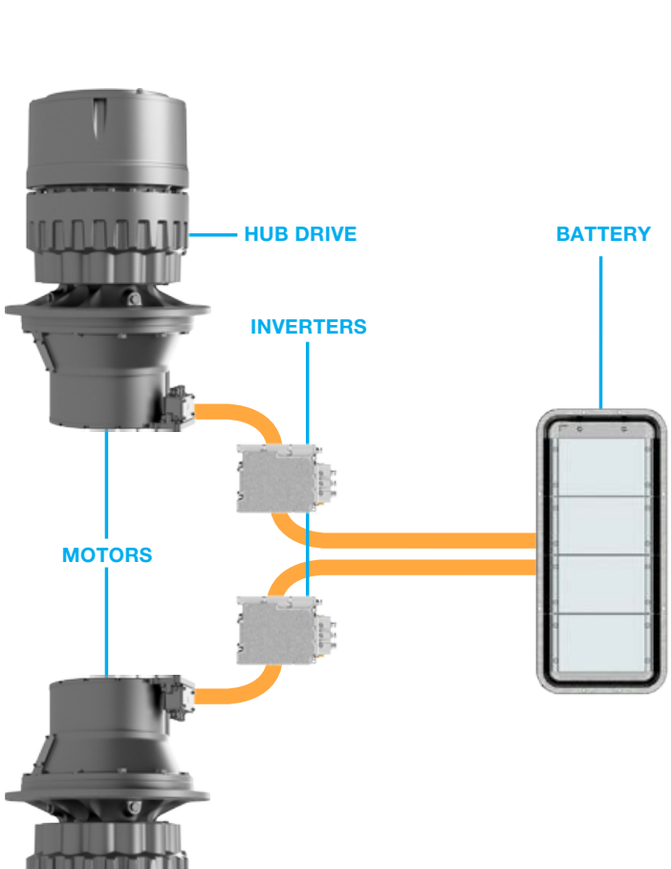
A motor is matched to a gearbox which then powers a driveshaft and axle.

Battery Electric Configurations

E-AXLE

A motor is connected rigidly or directly to the axle.





E-HUB DRIVE

A motor is matched to a planetary hub drive to power each tractive wheel directly.

APPLICATIONS

Our broad market access gives us a deep understanding of all types of vehicles, markets, and supply chains **– and how they can be leveraged to support one another. These cross-mobility market synergies also give us a unique** advantage in electrifying our offering across multiple applications in both drive and motion systems.

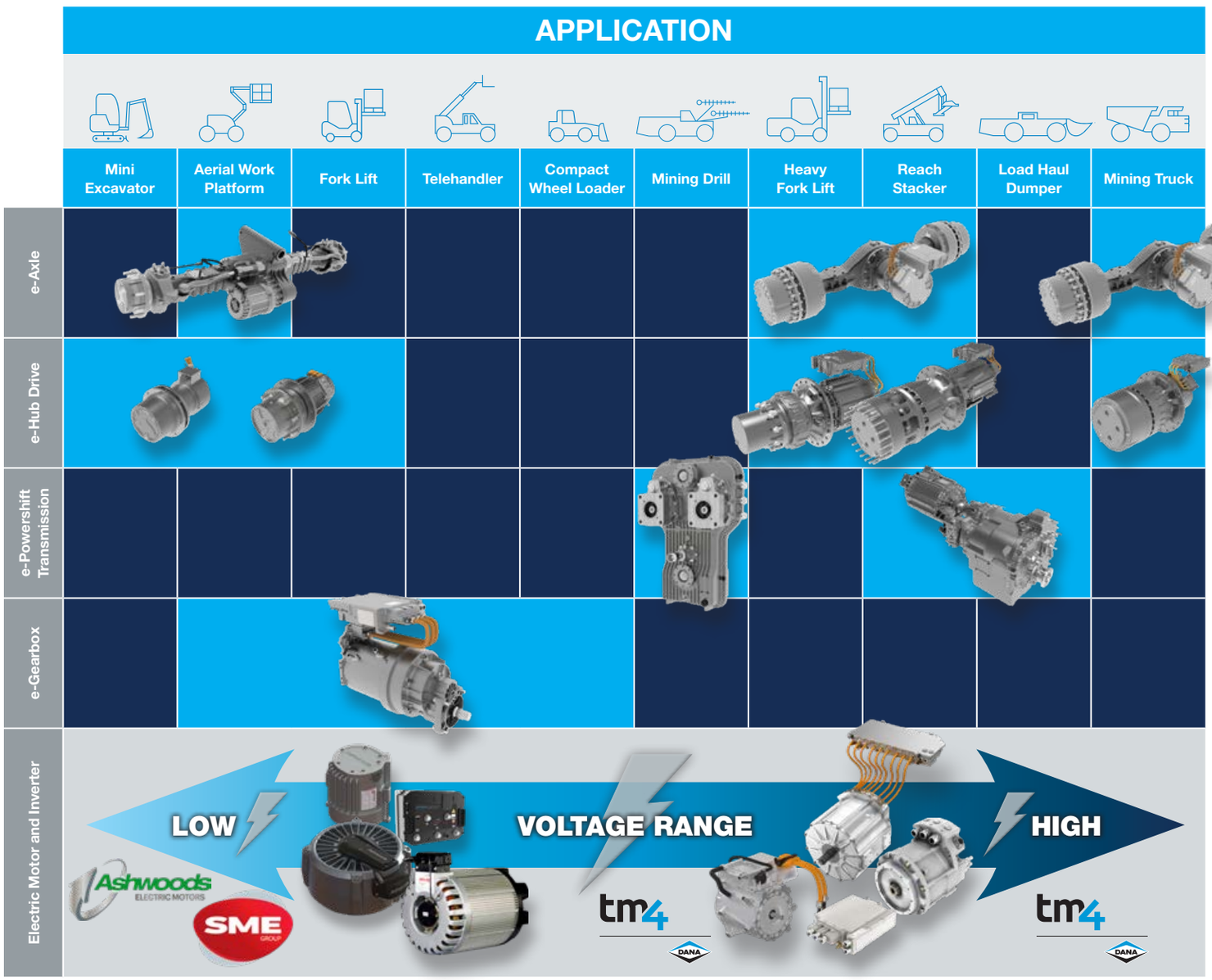
MINING

CONSTRUCTION

MATERIAL HANDLING

Application
Matrix

Today, Dana offers a full product portfolio for electrification needs. Through our market-proven brands, we can provide solutions for low-voltage and high-voltage applications, ranging from 24V up to 800 V.

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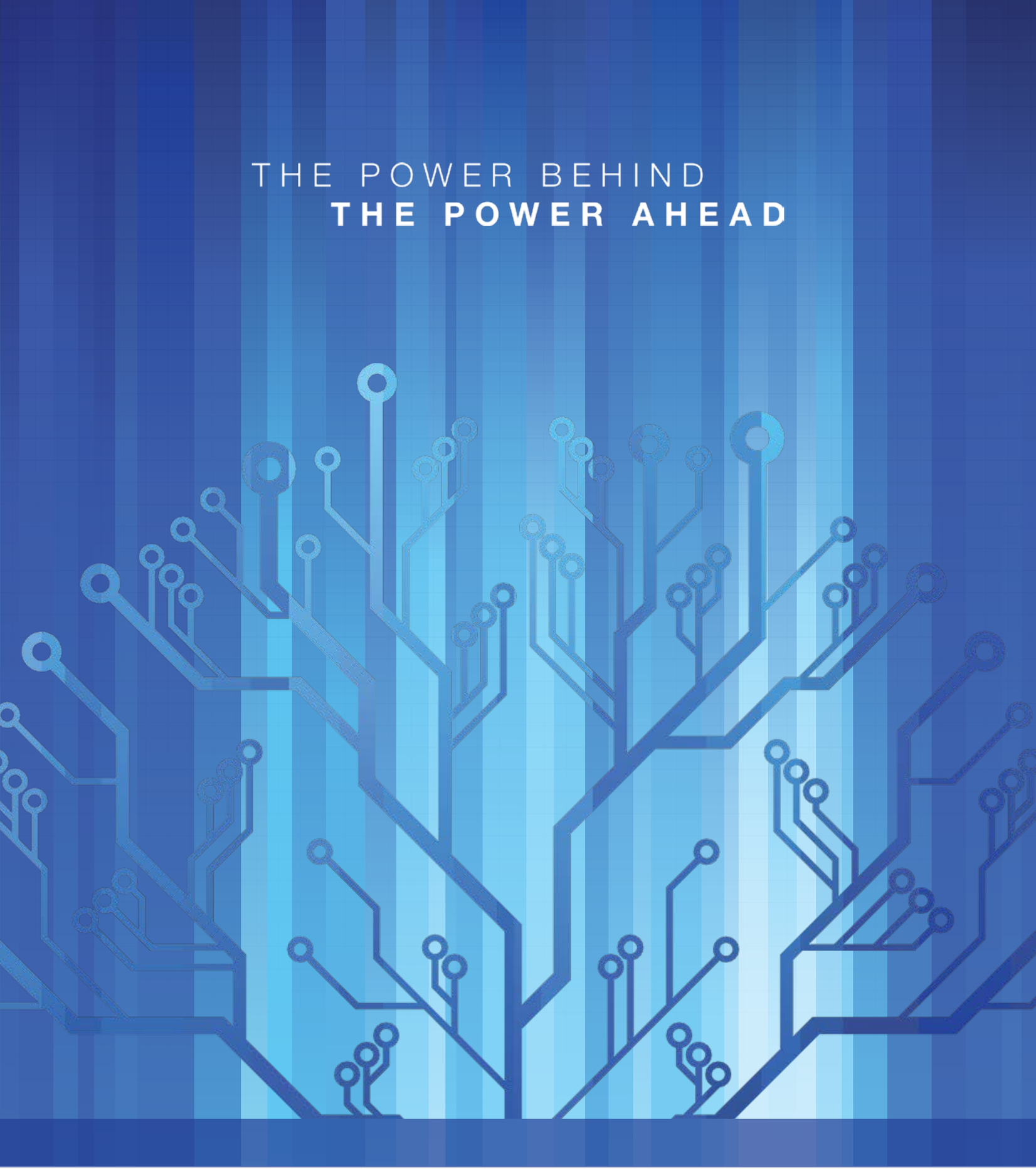

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