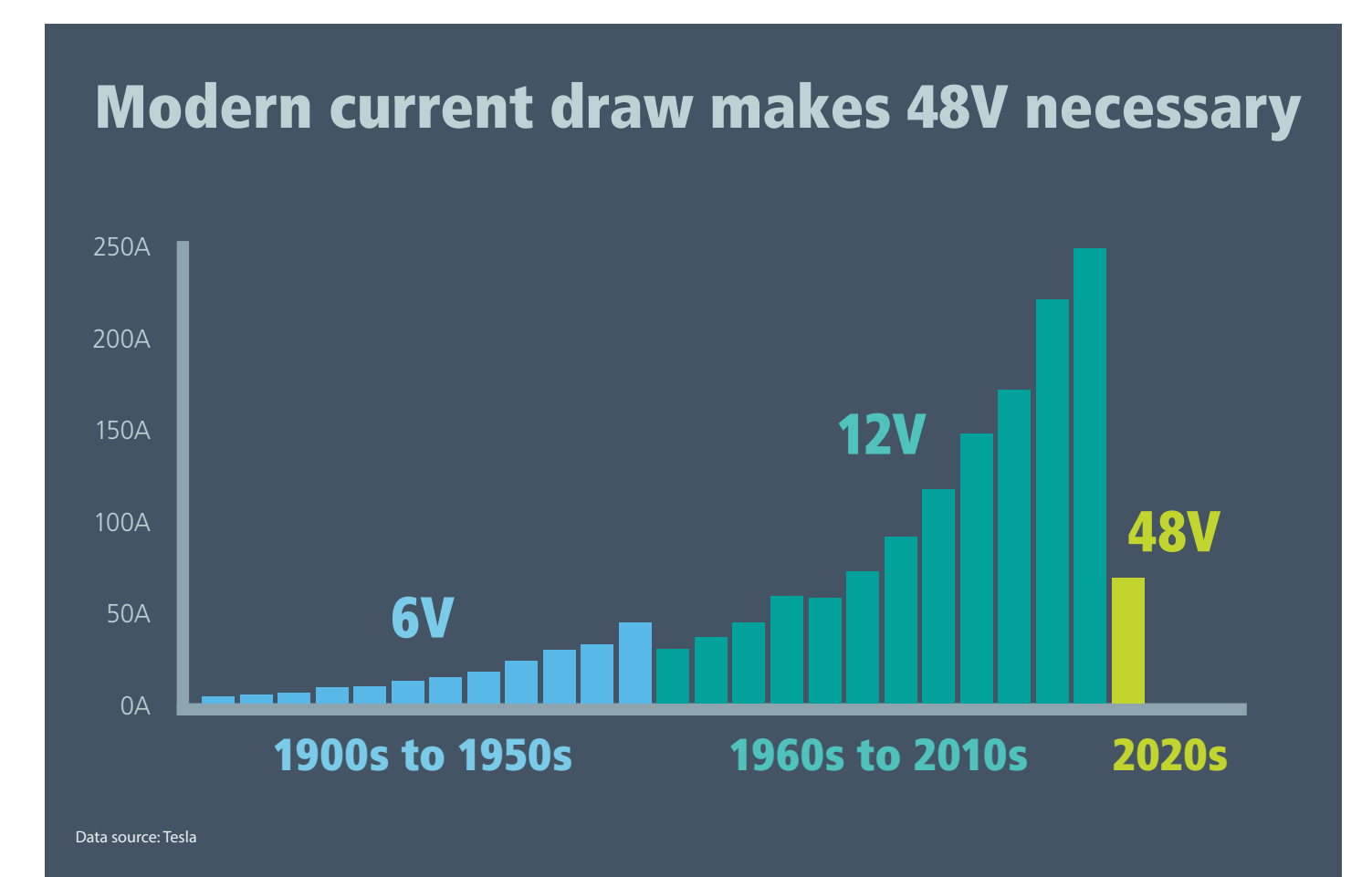


High-density power modules enable 48V systems that reduce weight and power loss



BEVs have a weight problem that can't be solved with traditional approaches. BEVs are getting heavier and adopting a 48V Zonal Architecture is needed to reduce weight and space. High-density power modules reduce weight, enhance efficiency and optimize the benefits of transition to 48 volt bus. As shown on the right, conversion to 48V system reduces vehicle total current draw from over 250A to under 75A without impacting the electrical content of the vehicle.



Transformation to zonal 48V architecture increases range

This novel 48V Zonal Architecture system capitalizes on Ohm's Law and is a paradigm shift for the industry, in which DC-DC conversion occurs closer to the points-of-load, rather than inside the centralized silver box.

Centralized

4 gauge wiring
5.8mm

180W power loss

Vicor Zonal Architecture

10 gauge wiring
2.5mm

90W power loss

Fast transient response of power modules enables auxiliary battery elimination

Power modules deliver a faster transient response than 12V lead acid batteries creating a virtual battery that can replace the legacy, heavy 12V battery.

33% smaller power box housing

18kg less weight

There are two distinct PDNs used in automobiles today. The 12V centralized architecture and fast-growing 48V Zonal Architecture. The former depends on the thick 12V wire harness, while the latter draws upon the thin 48V wire harness, which is far lighter, reduces heat loss and reduces current by a factor of four.

Weight reduction realized with Zonal Architecture

		Weight reduction
Wiring Harness	Using 10 gauge wire (48V)	2.5 kg
Auxiliary battery (48V and 12V)	Eliminate/minimize	13 kg
Cooling system	45lbs, reduced by 7%	1.5 kg
Power box housing	6lbs, reduced by 33%	1 kg
		18 kg

30% less charging events annually

	Average EV	Most efficient EV
Range per charge	571 km	805 km
Range per charge with zonal weight loss	602 km	848 km
Increase in range with zonal weight loss	31 km	43 km
Increase in range, x3 recharges/week	93 km	129 km
Increase in range, x52 weeks/year	4836 km	6708 km
Recharging events saved (for 13000 miles/year)	21%	30%