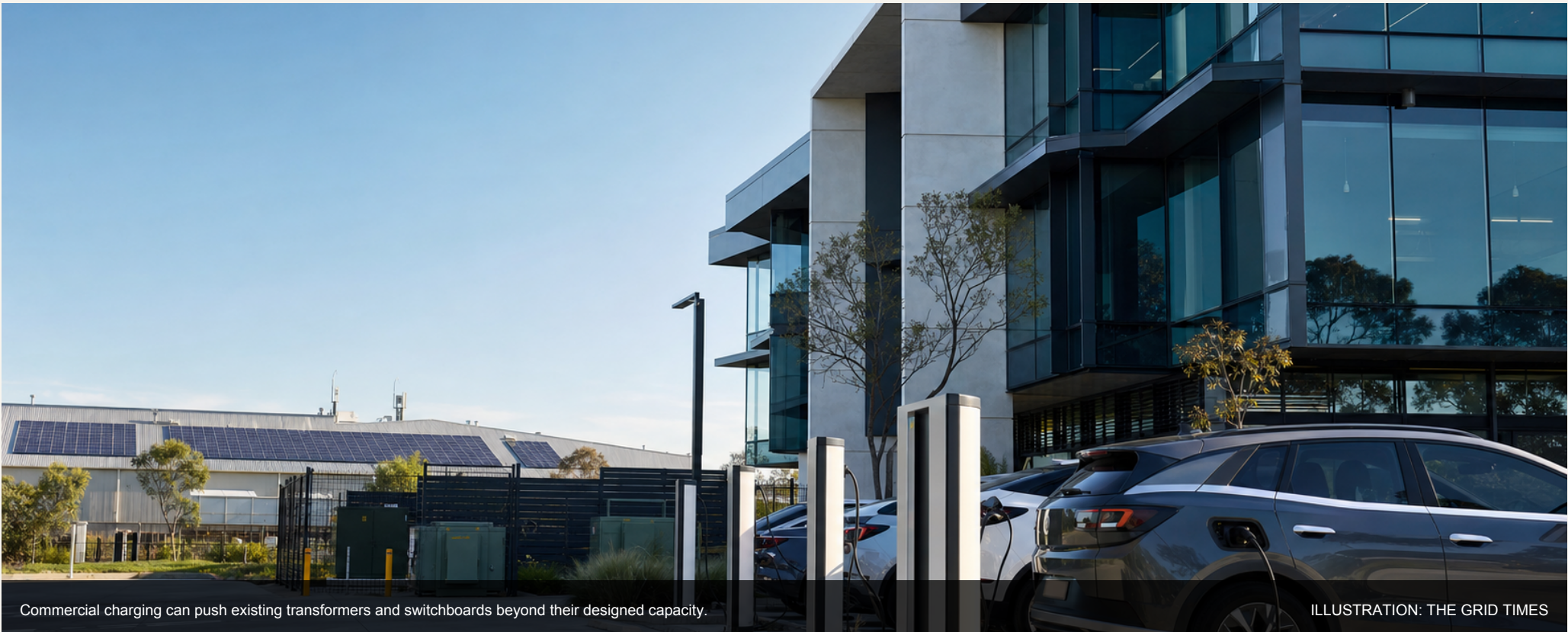


THE CAPACITY QUESTION

MORE CHARGERS. SAME CONNECTION.

Voltage Power Optimisation can cut a commercial building’s underlying demand, freeing electrical headroom for EV charging and deferring costly infrastructure upgrades.

BY THE GRID TIMES ENERGY DESK



Commercial charging can push existing transformers and switchboards beyond their designed capacity.

ILLUSTRATION: THE GRID TIMES

Electric vehicle charging is becoming a baseline expectation for offices, retail sites and fleet depots. But for many existing commercial buildings, the obstacle is not ambition - it is the electrical capacity already spoken for.

A typical AC charger draws 7-22 kW. DC fast chargers range from 50 kW to more than 350 kW. Even a modest rollout can therefore lift a building's peak demand enough to trigger larger switchboards, upgraded feeders, a new transformer or greater utility connection capacity.

Voltage Power Optimisation (VPO) offers another route. The technology regulates the voltage supplied to conventional building equipment, bringing it closer to the level needed for efficient operation. Where supply arrives at the upper end of the permitted range, loads such as HVAC, pumps, motors, lighting and refrigeration may consume more energy than necessary.

The key is not to make the chargers themselves use less power. Modern chargers already regulate battery charging through efficient power electronics.

Instead, VPO continuously trims the demand of the rest of the building. The resulting headroom becomes 'virtual capacity' that can be reassigned to EV charging without lifting the site's previous peak.

An application note from EMSc Asia Pacific illustrates the scale: an office building peaking at 800 kW could achieve an 8-14 per cent demand reduction through VPO. That would release about 64-112 kW - potentially enough for several Level 2 chargers - while leaving the building's overall peak demand unchanged.

The approach can also reduce maximum-demand charges, ease thermal stress on transformers and cables, cut distribution losses and improve downstream voltage regulation during busy charging periods.

THE CAPACITY MATH

64-112 kW

Potential demand released in the 800 kW office-building example.

ASSUMED VPO REDUCTION

8-14%

Smarter as a system

The strongest case comes when VPO works with smart chargers, a building management system, batteries and on-site renewables. Charging can respond to tariffs and real-time site demand while VPO minimises the underlying load.

For owners, the proposition is strategic: extract more value from existing infrastructure, stage EV expansion sooner and delay upgrades until they are genuinely required.

VPO is not a substitute for engineering assessment. But it can turn energy efficiency into deployable capacity.

01 WHAT VPO DOES	02 WHAT IT DOESN'T	03 HOW TO SCALE
Regulates supply voltage and reduces avoidable demand from conventional building loads.	It does not materially reduce the energy an EV charger needs to deliver to a vehicle battery.	Combine VPO with smart chargers, load controls, batteries and renewables for the greatest flexibility.