

GRID-SCALE BRIEF

The Power of Motion

Distributed generation from the freight fleet already on the road

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A Power Plant Already on the Road

The United States is searching for new sources of reliable grid capacity. Every conventional option remains critical to the long-term mix, but none can add supply quickly enough to match demand growth arriving now from data centers, electrification, and advanced manufacturing. Gravity introduces a different kind of source: the energy of freight in motion.

System Figures

Status	Figure	Basis
MEASURED	415 W peak	Operating vehicle under actual driving conditions, instrumented closed-course testing. Establishes that the full conversion chain functions on a moving vehicle.
MODELED	32 kW gross	Mean gross hydraulic capture, Class 8 platform. Pratt Miller Engineering model on Peterbilt 589 road profile data. Technical figure; never presented as output.
MODELED	10 kW net	Continuous net electrical output after conversion losses. The commercial figure.
MODELED	20,000 kWh / vehicle / year	10 kW net across a 2,000-hour annual duty cycle — a conservative long-haul baseline.
UNMEASURED	Class 8 physical output	No full-scale test has been conducted. Closing this gap is the purpose of the funded demonstration program.

Gross and net are distinct quantities and are never combined. The measured prototype result establishes the conversion architecture; it is not a commercial output claim. Commercial-scale figures are modeled and are labeled as such throughout.

The Building Block: One Truck

Every figure in this brief is built from a single modeled number. A Class 8 vehicle in motion produces a modeled 10 kW of continuous net output, derived from 32 kW mean gross hydraulic capture

reduced by conversion losses, established by Pratt Miller Engineering simulation on Peterbilt road profile data. Across a conservative 2,000-hour annual operating cycle that is 20 MWh per truck per year.

The national figures that follow are that modeled building block multiplied across the fleet. No new assumptions are introduced — and no new validation is implied. Scale claims inherit the status of the number they rest on.

From One Truck to Fleet Scale

Approximately 3 million Class 8 tractors operate across the United States. Applied at varying adoption levels, the modeled per-truck figure produces distributed generation on a scale normally associated with central power stations.

Fleet Adoption	Trucks Equipped	Annual Generation	Homes Referenced
10 percent	300,000	6 TWh	~570,000
25 percent	750,000	15 TWh	~1.4 million
50 percent	1,500,000	30 TWh	~2.9 million
100 percent	3,000,000	60 TWh	~5.7 million

Homes-referenced figures use approximately 95,000 homes per TWh per year. These are round-number references for scale.

Why This Capacity Behaves Differently

Property	What It Means for the Grid
Distributed by nature	Generated across the whole road network rather than concentrated at a plant, reducing transmission dependence and congestion.
Not weather-bound	Output depends on vehicles operating rather than on sun or wind. It follows economic activity.
No new central infrastructure	No new plants, no new transmission lines, no land acquisition, no multi-year permitting.
Fast to deploy	Once in production the system retrofits onto vehicles already in service. Capacity scales as fleets adopt.

On deployment timing

Gravity is pre-commercial today, with Class 8 validation and original-equipment integration underway. The terawatt-hour figures above describe capacity available at fleet-scale adoption, not generation available this year. What distinguishes the approach from central generation is the shape of the deployment curve: where a central plant requires a decade from approval to first power and

enormous fixed capital, distributed capacity accrues incrementally, each equipped vehicle contributing the moment it enters service.

A Starting Point, Not the Finish Line

This brief is deliberately limited to a single segment: Class 8 trucks. It does not attempt to quantify freight rail, buses, municipal fleets, passenger vehicles, defense platforms, or marine applications, each of which represents additional opportunity that has not yet been modeled or validated. The figures rest entirely on the one platform where output has been independently modeled on manufacturer data.

Even confined to that segment, the conclusion holds: harnessing the motion of America's freight fleet could add tens of terawatt-hours of distributed, reliable electricity to the grid, built on vehicles and roads the nation already operates. That capacity grows with every truck that enters service.

Gravity Driven Industries public edition. Figures stated by basis of evidence: measured on physical hardware, modeled in engineering simulation, or identified as not yet measured. Consistent with GDI System Figures — Current Reference v1.1, September 15, 2026.

v2.1 — public edition: internal-distribution marking removed; bench-top figure removed from System Figures; counterparty personnel names removed.