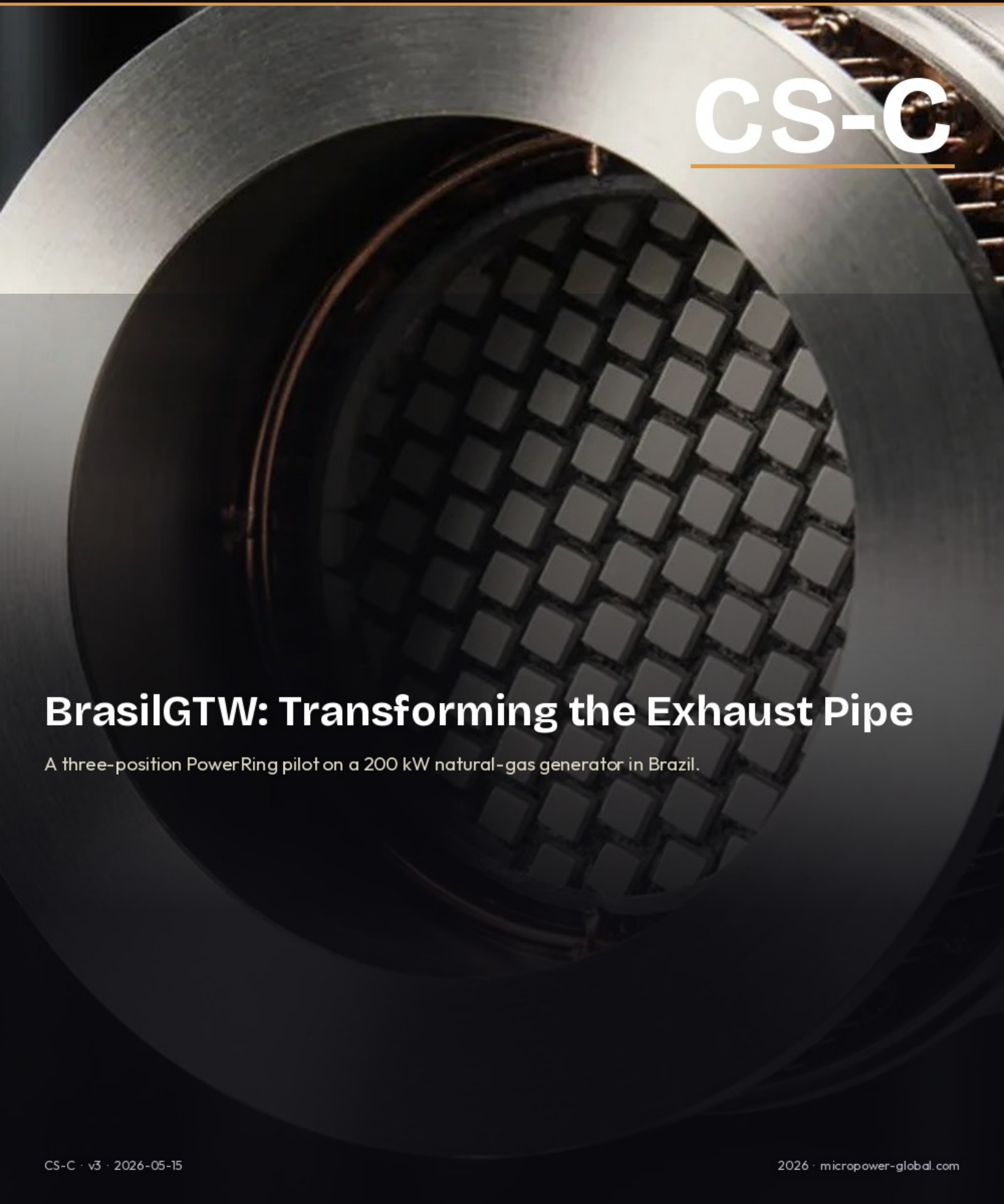

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BrasilGTW: Transforming the Exhaust Pipe

A three-position PowerRing pilot on a 200 kW natural-gas generator in Brazil.

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Industrial natural-gas generators dump useful waste heat out the exhaust. MicroPower's PowerRing wraps the exhaust pipe directly. This case study documents the first real PowerRing field pilot, deployed with BrasilGTW in late 2020 on a 200 kW generator set. Collaborative fabrication on site. Modular, staged installation. Real field data.

At a glance

Parameter	Value
Partner	BrasilGTW (industrial NG generator integrator, Brazil)
Host unit	200 kW natural-gas generator
Target recovery (full system)	~25 kW per generator
Pilot module	MPG PR175 PowerRing
Pilot architecture	Three PowerRing positions in exhaust stream, upstream of muffler
Programme start	October 2020
Trip 1	November 2020 — thermal profiling + initial longevity testing
Fabrication model	Collaborative — BrasilGTW fabricated to MPG-provided drawings

1 · The partner and the host unit

BrasilGTW is a Brazilian industrial natural-gas generator integrator. Their fleet of 200 kW-class NG generator sets is deployed across industrial and commercial customers. The thermal energy in each generator's exhaust stream is substantial — the partner's own analysis identified three geometrically distinct zones where MicroPower modules could plausibly harvest energy, with a total system target of approximately 25 kW per generator.

The three zones MicroPower identified on the 200 kW unit: Zone 1 (1–2 kW harvestable, closest to the generator exit); Zone 2 (12–18 kW harvestable, the main geometric section of the exhaust pipe); Zone 3 (2–5 kW harvestable, between the final PowerRing position and the muffler). Zone 2 is where the bulk of the recoverable energy sits.

2 · The pilot architecture — three PowerRing positions

A PowerRing is a MicroPower module designed to wrap the exhaust pipe directly, rather than bolt to a flat plate. On the BrasilGTW exhaust, three PowerRing positions were designed into the pipe upstream of the muffler.

Position 1 sits closest to the generator exit, where the exhaust is hottest. Position 2 sits in the middle section. Position 3 sits nearest the muffler. Each position was installed as a blank PowerRing (structure only, no PowerBlock modules) first, then progressively populated — partially, then fully — as the thermal profile and engine performance impact were validated.

The staged population sequence — blank → partially populated → fully populated — lets the pilot team confirm at each step that engine performance is not adversely affected by the added back-pressure before committing further chip hardware.

3 · Collaborative fabrication — how the pilot actually got built

BrasilGTW's engineering team fabricated the pilot mechanical assembly to MicroPower-provided design specifications, before MicroPower's technical team arrived on site. This is a model for how MicroPower engages with geographically distant industrial partners.

The BrasilGTW team produced: 24 frame panels (three sets of eight); 6 frame end plates (three sets of two); 8 flange-assembly parts (three sets of two, plus two additional for the tailpipe extension); 24 cover plates (three sets of eight); gasket material for the cover plates and flanges; and all required bolts, nuts, and washers. The frame panels and end plates were welded together seamlessly to ensure zero exhaust leaks.

This arrangement — the host customer carries the fabrication work against MicroPower drawings — is what keeps overseas pilot deployment economics viable for a small-team company. The model is directly portable to other international genset OEMs.

4 · Trip 1 — November 2020 field programme

The November 2020 site visit (Trip 1) had three objectives: evaluate the impact and performance of PowerRing units installed in the preselected positions; determine the optimal positions and MPG PowerRing / PowerBlock configuration; and install the optimal configuration and leave the system for extended longevity evaluation.

4.1 Engine-performance impact test. Before any PowerBlock modules were installed, the three blank PowerRing structures were run with the generator under normal load to confirm that the added mechanical back-pressure did not degrade engine performance. This is a load-bearing condition for any waste-heat-recovery retrofit: the pilot must not compromise the host unit.

4.2 Partial population and thermal profiling. Once engine performance with the blank PowerRings was cleared, the units were progressively populated with PowerBlock modules. Cooling-water circulation was installed to manage the cold side. Positions 1 and 2 were left in a partially-populated configuration for the extended-longevity phase, with Position 3 left as a blank structure for reference.

4.3 Ongoing operator-side monitoring. After MicroPower's departure, a designated BrasilGTW person monitored the system performance, collecting data daily for the first two weeks, then weekly thereafter, reporting back to MicroPower. The operator-side engineering discipline — turn the engine off and on on MPG request, install/deinstall PowerBlock modules as requested, provide fabrication support on demand — is a direct output of the pilot-phase working model.

5 · What the pilot established

First, the PowerRing geometry works. The module wraps the exhaust pipe without demanding a redesign of the host unit, and it integrates with standard flange-connector hardware the industry already uses.

Second, the staged population model (blank → partial → full) is the right pilot discipline for this application class. Thermal energy and back-pressure are measured before the full chip population is committed; the operator's engineering team retains confidence in the host unit throughout.

Third, remote-site collaborative fabrication is a viable engagement model. BrasilGTW's capacity to fabricate pilot hardware to MicroPower drawings, and to do so before MPG's team arrived on site, was a material enabler of the programme.

6 · Where the GTW engagement sits now

The BrasilGTW PowerRing pilot is the first real field deployment of MicroPower's pipe-wrapping module geometry. It validates the PowerRing form factor against an operating 200 kW NG generator, and it establishes the collaborative-fabrication engagement model MicroPower uses with internationally distributed partners.

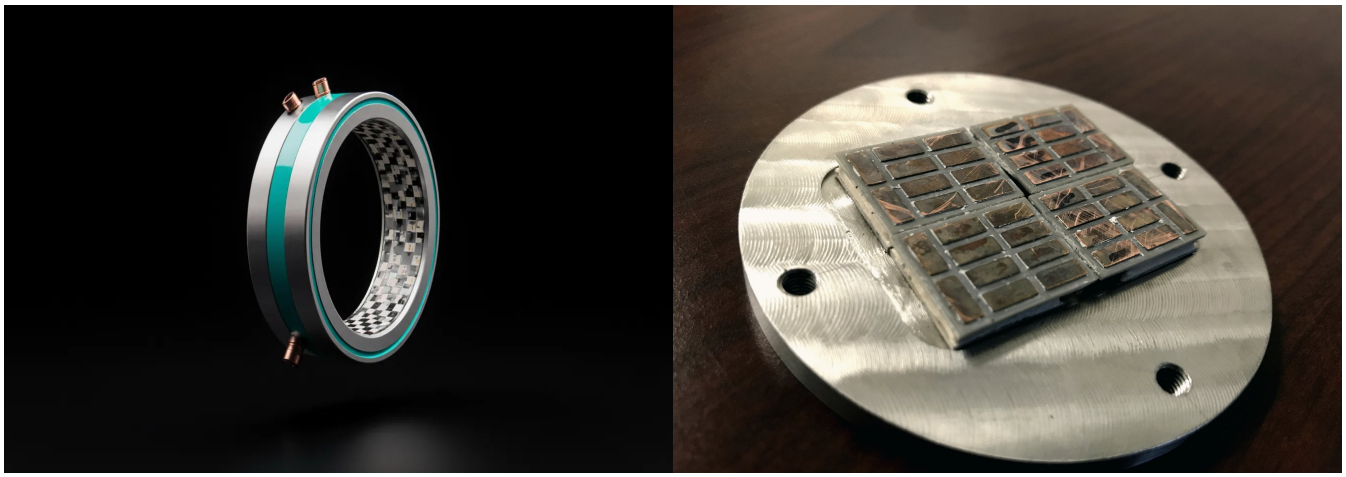
This is the precedent for the current MicroPower BTM (behind-the-meter) and datacentre genset-exhaust applications described in the flagship WPs. The geometry, the staged-population discipline, and the thermal-profile-first pilot methodology are all directly inherited from the BrasilGTW work.

Closing

The BrasilGTW PowerRing pilot validates the pipe-wrap module architecture in an operating industrial generator context. The pilot does not yet quantify commercial-scale energy delivery — that is the next step.

Engagement model is appropriate for first installations and is intended to lead to turn-key drop-in installations on like gensets, not requiring this level of direct MPG intervention.

MicroPower is open to partner conversations with genset OEMs, industrial generator operators, and hyperscaler BTM teams on extending the PowerRing pilot into first commercial power delivery.



Sources & notice

Sources: Power Harvesting from NG Generators, BrasilGTW, October 2020 initial scoping deck; Power Harvesting from Industrial Generators — Phase 1 Trip Report, Transforming the Exhaust Pipe, November 2020 trip report. Both archived in the MicroPower customer records.