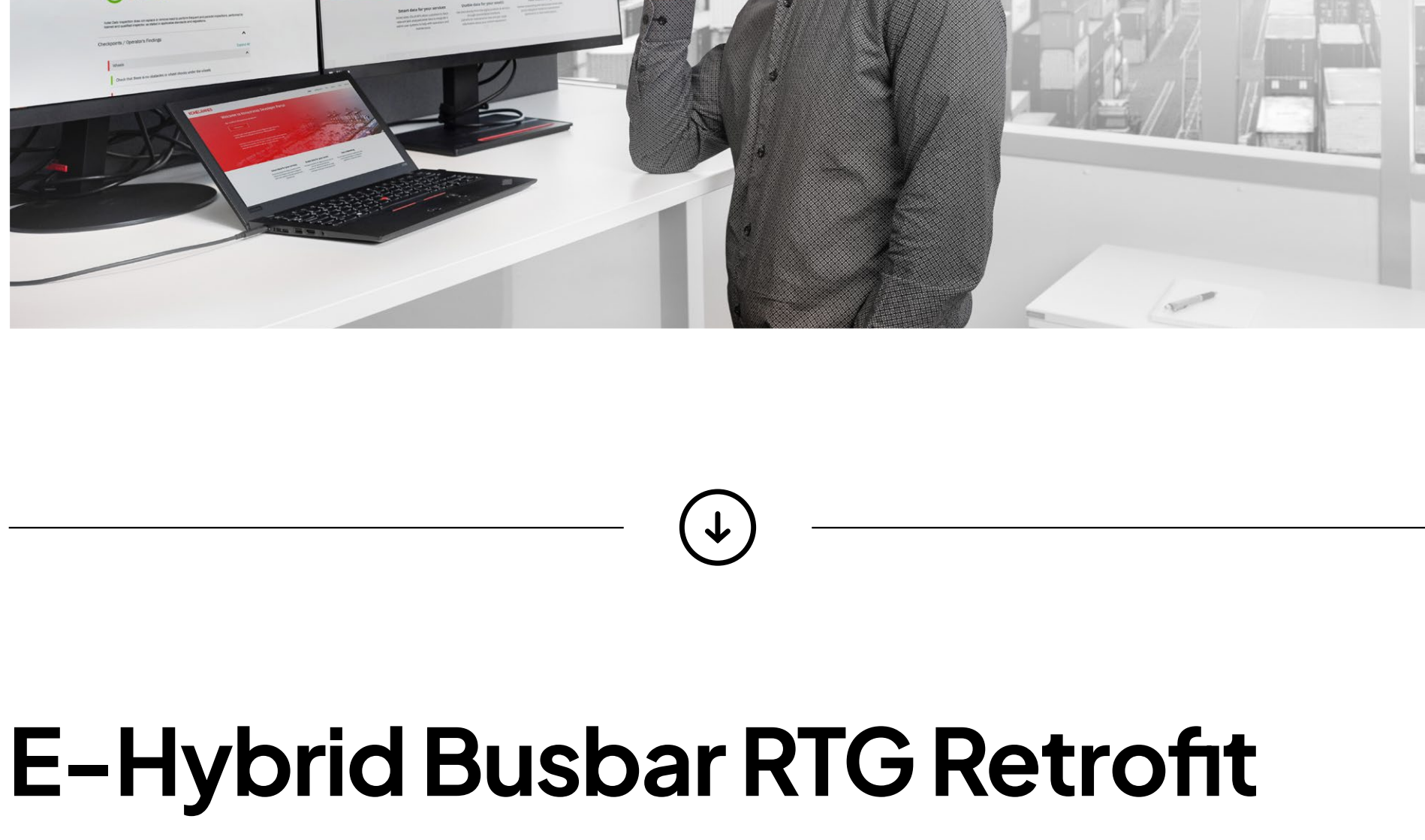


E-Hybrid Busbar RTG Retrofit

Zero tailpipe emissions*. Unlimited autonomy. Never stop to charge.

Adapt and thrive

Konecranes is the premier port services provider to brownfield terminal developments. Our range of retrofit products will enable your fleet to adapt to a fast-changing environment. Welcome to your evolution.



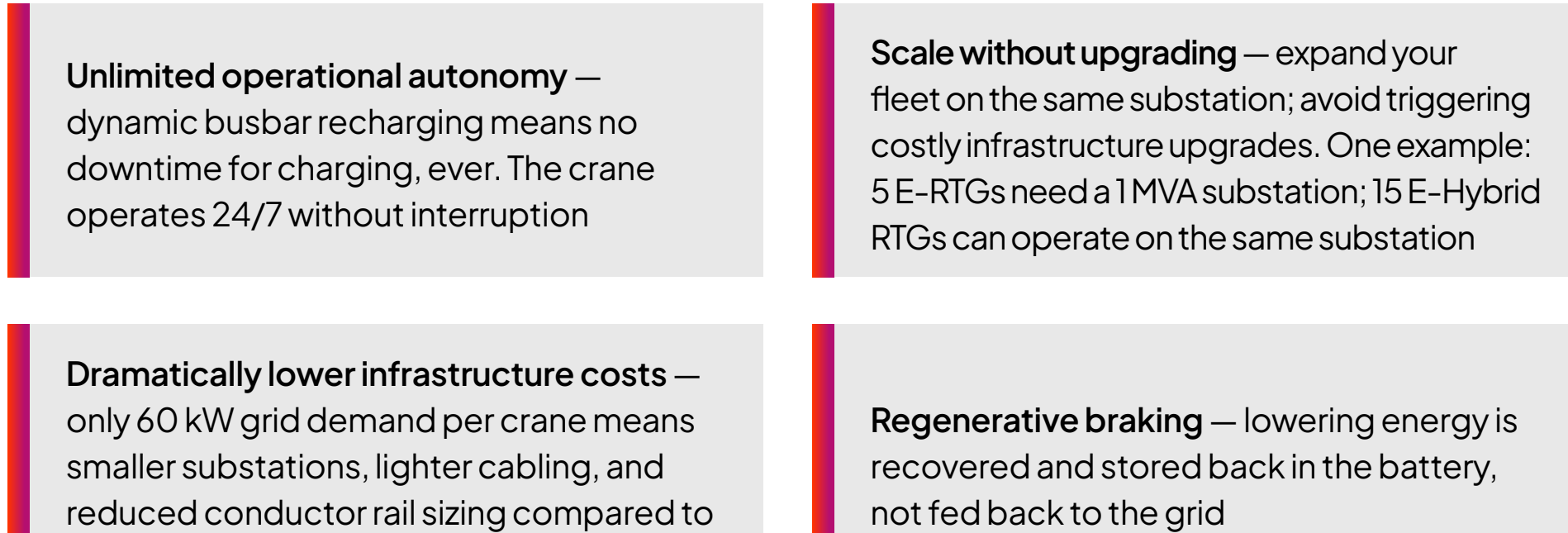
E-Hybrid Busbar RTG Retrofit

Combines a lithium-ion battery pack with a busbar system for **unlimited operational autonomy**. The battery powers all crane functions. While the crane gantries along the busbar-equipped section of the stack, the battery recharges continuously at just 60 kW. The crane never stops for charging.



Unlimited autonomy with dramatically lower infrastructure cost

Conventional E-RTGs deliver Zero tailpipe emissions* through full-time grid power — but require heavy infrastructure rated for ~400 kW per crane. And when the grid fails, so does the crane. The E-Hybrid takes a different approach. The battery powers all crane operations; the busbar simply recharges it at a steady 60 kW during gantry travel. That 85% reduction in grid demand means smaller substations, lighter cabling, and more compact conductor rails — with potential infrastructure savings of more than 40%. And because the battery is the primary power source, the crane keeps working through grid outages. In unstable-grid regions, that resilience alone can justify the investment.



Benefits

- Unlimited operational autonomy** — dynamic busbar recharging means no downtime for charging, ever. The crane operates 24/7 without interruption
- Scale without upgrading** — expand your fleet on the same substation; avoid triggering costly infrastructure upgrades. One example: 5 E-RTGs need a 1 MVA substation; 15 E-Hybrid RTGs can operate on the same substation
- Dramatically lower infrastructure costs** — only 60 kW grid demand per crane means smaller substations, lighter cabling, and reduced conductor rail sizing compared to conventional E-RTG (~400 kW per crane)
- Regenerative braking** — lowering energy is recovered and stored back in the battery, not fed back to the grid
- Zero tailpipe emissions*** with up to 70% lower operating costs than diesel (up to 50% vs. hybrid) through zero fuel consumption and elimination of diesel maintenance
- Full avoidance of engine-related maintenance** — removal of diesel genset eliminates engine servicing, oil changes, and filter replacements
- Blackout resilience** — battery sustains full crane operation during grid outages; only recharging is interrupted. No sudden stops, no component damage
- Automated busbar drive-in/out** — magnetic switches on the current collector trolley handle connection and disconnection seamlessly during block changes

Key Specifications

PARAMETER	DETAIL
Battery options	130 kWh (~2h, EAS RTG), 148 kWh (~2h, ALC RTG), 222 kWh (~4h), or 296 kWh (~8h)
Battery chemistry	Lithium-Ion
DC/DC converter	425 kW bidirectional
Charging method	Dynamic: 60 kW via busbar during gantry travel
Grid power demand	Only 60 kW per RTG (vs. ~400 kW for conventional E-RTG)
Blackout resilience	Yes — battery sustains operation during grid outages
Busbar drive-in/out	Automated via magnetic switches on current collector trolley
Regenerative braking	Yes — lowering energy recovered to battery
Autosteering	Required (Konecranes Auto-Steering Retrofit)
Performance	Uncompromised at 40T; same speed and cycle times as diesel
Operational autonomy	Unlimited — no charging downtime required
Battery design life	8 years at typical duty cycles

How It Works

The E-Hybrid uses two power sources working together:

Battery pack
(primary)

Powers all crane functions: hoist, trolley, gantry, and auxiliary systems. The battery is always the source of power to the crane's DC bus, whether or not the busbar is connected. Braking energy from lowering and deceleration is regenerated directly into the battery.

Busbar system
(secondary — recharging only)

While the crane gantries along the busbar-equipped section of the stack, a drive-in unit connects the current collector trolley to the conductor rail. The busbar supplies a steady 60 kW to recharge the battery. During block changes, the drive-in unit disconnects automatically via magnetic switches, and the crane travels to the next stack on battery power alone.

During a grid outage
The battery continues to power all crane functions without interruption. Only the recharging via busbar is paused. The crane operates normally until the battery reaches its lower state-of-charge limit — which, depending on battery size, provides hours of continued operation. busbar installations.

Choosing the right battery size
Battery size determines two things — how long the crane operates during a blackout, and whether it can work outside busbar-equipped stacks. Short outages and busbar-only operation suit a smaller battery. Long outages or flexible deployment across the yard call for a larger pack.

Infrastructure Implications

The E-Hybrid's low power demand fundamentally changes the economics of yard-side electrification:

- Substations**

Instead of 2 MVA or larger substations required for conventional E-RTGs, significantly smaller units are sufficient. In a terminal expansion scenario, 15 E-Hybrid RTGs can operate on the same 1 MVA substation that previously supported only 5 conventional E-RTGs.
- Cabling**

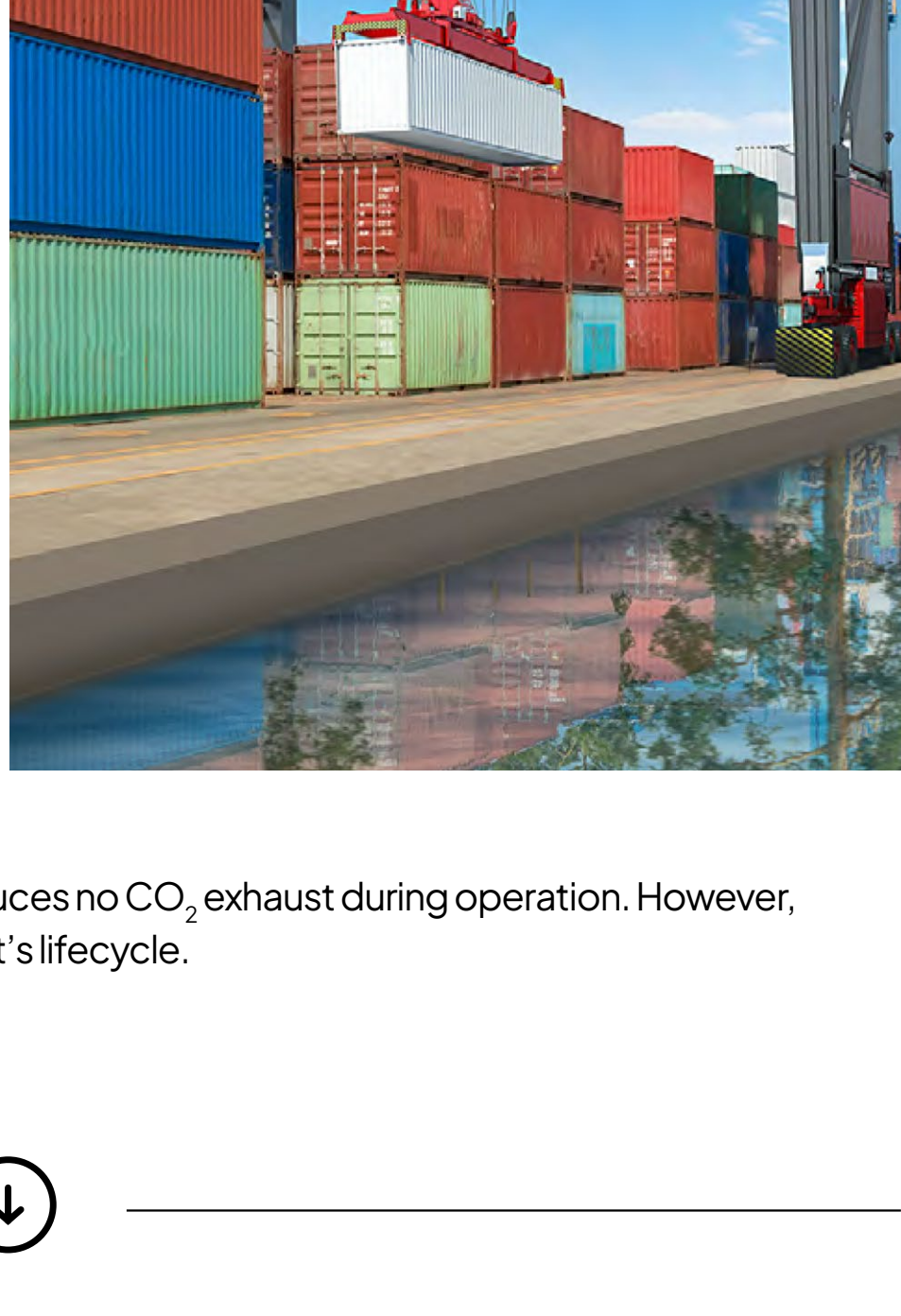
Reduced power means reduced cable cross-section and lower-cost materials. In one greenfield comparison, cabling costs were reduced by 65% versus conventional E-RTG.
- Conductor rails**

The busbar system supplier can provide smaller rails — for example, 500 A capacity instead of 1,000 A — leading to significant savings on this component of the infrastructure.
- Overall**

In calculated scenarios, more than 40% savings on key yard infrastructure costs were achieved compared to conventional E-RTG installations.

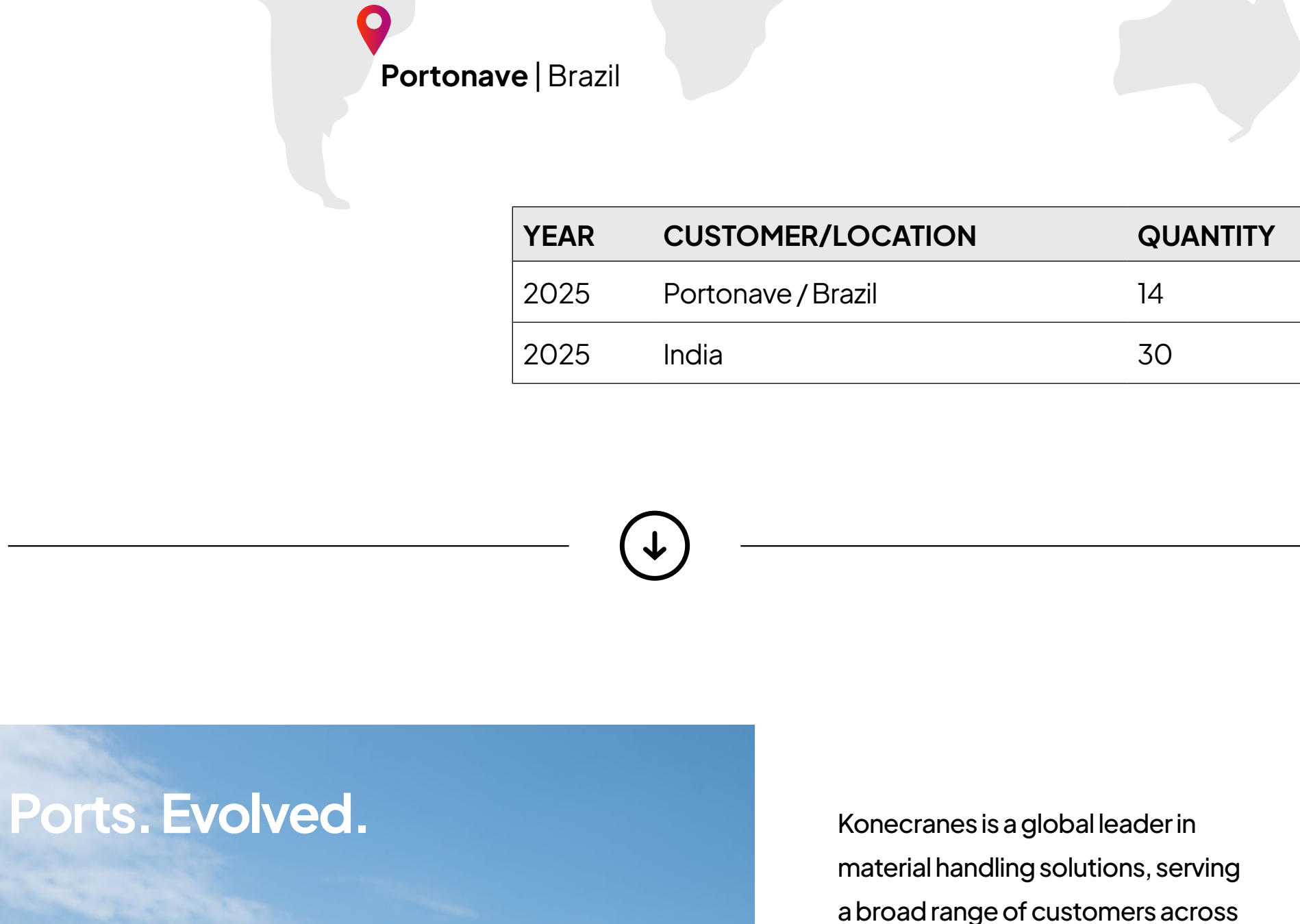
Ideal for

- 24/7 high-utilisation operations where any charging downtime is unacceptable
- Existing E-RTG customers (busbar or cable reel) seeking to cut peak power demand, save on infrastructure for expansion, or eliminate blackout vulnerability
- Terminals planning expansion — E-Hybrid avoids triggering additional high-cost infrastructure upgrades; expand your fleet on existing substations
- Grid-unstable regions where power outages cause conventional E-RTG downtime and potential component damage
- Operators wanting Zero tailpipe emissions* and operational freedom to work outside busbar-equipped stacks on battery power alone



* Zero tailpipe emissions mean the equipment produces no CO₂ exhaust during operation. However, emissions may still exist in other parts of equipment's lifecycle.

Selected References



Ports. Evolved.

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