

CASE STUDY



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VinFast Scaled EV Assembly Across 3 Countries Without Rebuilding a Single Line.

How VinFast replaced fixed conveyor infrastructure with a single, standardised AGV-based marriage line running across EV assembly facilities in Vietnam, Indonesia, and India.

Overview

VinFast, one of Southeast Asia's fastest-growing electric vehicle manufacturers, operates high-volume EV assembly lines across multiple countries, serving a vehicle portfolio that keeps expanding.

The plant's most precision-critical operation - marrying front and rear axles to the car body - demanded exact positioning, synchronised lift, and consistent alignment across multiple variants. The existing conveyor-based system could not flex with variant growth, could not replicate across new facilities, and forced operators to handle axles manually at the highest-risk stage in final assembly.

Novus Hi-Tech replaced the architecture underneath the operation. Through EasyWay omni-directional AGVs with dual-lifter fixturing, VinFast achieved flexible, safe, and scalable axle-to-body marriage, standardised once and running across three countries.

Results at a Glance

Zero

Safety incidents in the marriage zone post-deployment

3

Facilities live (Vietnam, Indonesia, India)

6-8 wks

Full production throughput achieved per facility

100%

Reduction in axle misalignment incidents post-deployment

CLIENT AT A GLANCE



SECTOR

Electric Vehicle Manufacturing



FACILITIES

Vietnam, Indonesia & India



LINE TYPE

Multi-variant EV final assembly



DEPLOYMENT

EasyWay omni-directional AGVs + dual lifter



OPERATIONS

Mixed-Model Assembly

The Challenge

VinFast's axle-to-body marriage operation sits at the most error-sensitive point in EV final assembly. Front and rear axles must be lifted, positioned, and aligned to the car body within tight tolerances - every cycle, every shift. An error at this station does not get corrected at the station. It travels downstream.

The existing conveyor-based line was engineered for a different era: a fixed variant mix, one facility, and a production plan that held still. VinFast's production plan does not hold still. New models, new markets, new plants arrived faster than the architecture could adapt.

Adding a new EV variant meant re-engineering hardware. Opening a new country meant rebuilding the line from the ground up. Manual axle handling remained in place at the highest-risk stage because the conveyor offered no alternative. The line had become a constraint on growth, not an enabler of it.

THE CORE TENSION

Conveyor automation made the line a fixed asset and production the variable. VinFast needed the opposite - a marriage line that could flex with its vehicle roadmap and replicate to any country without re-engineering the architecture each time.

Four Compounding Risk Factors

01 Inflexible Variant Setup

Adding new EV models required hardware re-engineering, not a software update. The product roadmap had outgrown the line's capacity to adapt.

02 Manual Axle Handling

Manual and semi-automated axle positioning introduced safety exposure and assembly inconsistency at the stage where misalignment is most expensive to correct downstream.

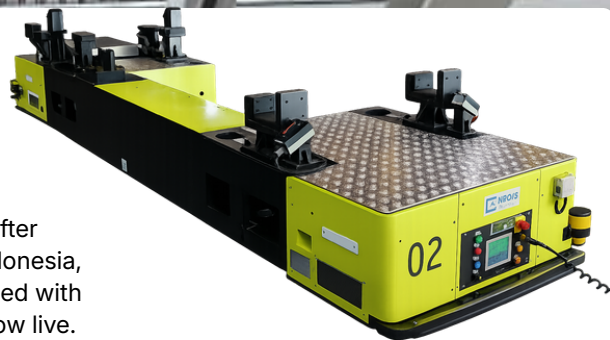
03 No Standardized Architecture

04 Single-Point Line Failure

A fixed conveyor stops entirely on a single fault. With no redundancy built into the architecture, every failure became a full-line shutdown event.

Our Solutions

Novus Hi-Tech deployed EasyWay omni-directional AGVs with dual-lifter fixturing across VinFast's axle-to-body marriage lines in Vietnam, Indonesia, and India. Fixed conveyor infrastructure was removed entirely, replaced with an adaptive, operator-safe assembly system. All three facilities are now live.



Stage 1: Dual-Lifter AGV Assembly

Each EasyWay AGV carries both front and rear axle assemblies simultaneously, presenting them beneath the car body at the correct position and orientation in a single pass. Sensor-guided automated alignment eliminates the manual positioning that drove inconsistency and safety exposure.

- Dual-lifter fixturing: front and rear axles on one unit
- Sensor-guided automated positioning
- Single-pass marriage, no repositioning required
- Consistent alignment across every variant, every shift

Stage 2: Omni-Directional Movement

Omni-directional drive eliminates the long turning loops and dedicated travel corridors that fixed conveyors demand. The AGV navigates the floor plan as it exists. The floor plan no longer has to be redesigned around the machine.

- No turning loops, no dedicated travel corridors
- Reconfigurable paths without civil modification
- Improved shop-floor space utilisation
- Layout adapts to the facility, not the other way around

Stage 3: Conveyor Elimination - The Line Becomes Portable

AGVs replace the fixed conveyor as both the movement and precision positioning layer. Transport and alignment are now the same reconfigurable asset. The marriage zone is no longer anchored to a building.

- Conveyor removed from the marriage zone entirely
- Line reconfigurable as the vehicle portfolio grows
- AGVs serve as transport and positioning in one unit
- Zero line stoppage to reconfigure

Stage 4: Multi-Variant Scale - One Line. Every Model.

The system runs multiple EV body variants on a single line without mechanical changeover, with built-in headroom for new models as VinFast expands its portfolio. The same standardised line is now running in three countries.

- Multiple EV variants, zero mechanical changeover
- Standardised line replicates across facilities
- New models added without line modification
- 6–8 weeks from installation to full production throughput

Results & Impact Metrics

The Novus Hi-Tech deployment delivered measurable, sustained outcomes across three live assembly facilities. These were not short-term gains. The results reflect a structural change in how the line operates - and how it scales.

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Before vs. After - Key Metrics

Metric	Before Novus	After Deployment	Improvement
Line Architecture	Fixed conveyor, fixed sequence	Modular AGV fleet, reconfigurable	Conveyor-free marriage zone
Variant Changeover	Hardware re-engineering required	Route change, no hardware adjustment	Zero changeover downtime
Axle Positioning	Manual / semi-automated	Sensor-guided, automated	No misalignment incidents recorded post-deployment
Failure Impact	Line stops on single fault	Redundant AGV units maintain flow	Zero single-point dependency
Facility Replication	Bespoke conveyor per site	Standardised AGV line	3 sites, reduced buildout cost
Go-Live Timeline	6–12 months per conveyor build	6–8 weeks from installation start to full production throughput, per facility	Repeatable across every new market

Your Next Facility Shouldn't Cost You a New Line.

Most EV manufacturers rebuild their marriage line from scratch every time they enter a new market. VinFast doesn't.

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