

HIGH VALUE

MANUFACTURING



Supporting US Automotive Manufacturing
including BEV Assembly, Hybrids, and
Battery Manufacturing



CONTENTS

3	—	BEV in the United States
4	—	BEV in the Southeast
6	—	HVM Value Proposition
8	—	Core Areas of Focus
10	—	BEV Experience
12	—	Perspectives
14	—	Let's Talk

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BEV in the United States

The U.S. automotive industry is on the move. The transition toward vehicle electrification has gained momentum. Government incentives in the U.S. are propelling investments in plant launches, increased production capacity, and high-paying manufacturing jobs for battery electric vehicle (BEV) assembly including Hybrids, and battery manufacturing. Legislation is supporting environmental initiatives, such as reduced greenhouse gas emissions. The price of EVs is decreasing, and demand is increasing.

With the Infrastructure Investment and Jobs Act (IIJA), an EV charging infrastructure will expand to every state, making public charging more accessible and affordable. The Inflation Reduction Act (IRA) has spurred significant investment in EV manufacturing plant launches and related suppliers, which creates jobs and economic growth. Manufacturers are proactively signaling strategic growth in the EV sector as indicated by numerous announced and anticipated facility investments across the country.



It is projected that BEVs and Hybrids will comprise an ever-increasing percentage of new sales of light- and medium-duty vehicles over the next decade. With such a specific and ambitious goal, the automotive manufacturing community is making strides in supply chain engagement, risk mitigation, product quality and testing, and production expansion to meet customer demand. During this period of growth opportunity, keeping operational costs low will be a priority.

High Value Manufacturing (HVM) deploys highly experienced, highly skilled labor resources in manufacturing facilities that require specialized knowledge or skillsets. HVM's team has been hands-on in recent launches of battery manufacturing operations and BEV assembly. Our manufacturing clients rely on our team's vast experience to quickly identify issues and to implement immediate, sustainable solutions that achieve operational goals and increase profitability.

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BEV in the Southeast

The Southeast region of the U.S. is attracting battery manufacturing operations for geographic proximity to automotive manufacturing sites including GM, Ford, BMW, Volkswagen, Toyota, Nissan, and Hyundai/Kia — all of which have signaled commitments to the growth of Battery Electric and Hybrid Vehicles. SK, Samsung, LG, and other Tier 1 suppliers have also announced battery manufacturing sites in the Southeast.

Strengthening the Supply Chain

OEMs and suppliers must work closely to ensure product quality and on-time delivery throughout the supply chain. In some cases, battery manufacturers and automotive manufacturers are entering into strategic partnerships and establishing plant operations on the same mega site.

Closer to Customers

As demand for BEVs and Hybrids increases, manufacturers are tightening supply chains to meet customer requirements in a timely manner. Locating operations in the Southeast and coordinating with regional suppliers allows manufacturers to serve those local markets in addition to accessing the robust and varied distribution channels to reach customers abroad.

Skilled Workforce

The Southeast offers a skilled engineering workforce that has been cultivated to support existing OEMs and suppliers in the region. Existing companies have already invested in a knowledgeable labor pool of manufacturing talent: an attractive selling point for battery manufacturers evaluating locations.

The Southeast is well positioned for manufacturing sector investments, especially in BEV and Hybrid production over the next few years. These companies have already realized the advantages of the Southeast with these launch and expansion announcements:

BMW	SC
Ford Motor Company & SK On (BlueOval City)	KY + TN
General Motors & Samsung SDI	TBD
General Motors & Ultium Battery	OH + TN
Honda & LG Energy Solutions	OH
Hyundai & SK On	GA
Mercedes-Benz	AL



Rivian	GA
Samke Corp.	AL
Scout Motors Inc	NC
Stellantis & Samsung SDI	IN
Toyota & Panasonic	NC
Volkswagen	TN

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Value Proposition

High Value Manufacturing has been providing highly experienced, skilled contractors to support new plant and new product launches for 10 years. By utilizing HVM contract resources, our clients have realized savings in many ways:

REDUCED HEADCOUNT BY A FACTOR OF 2.5:1

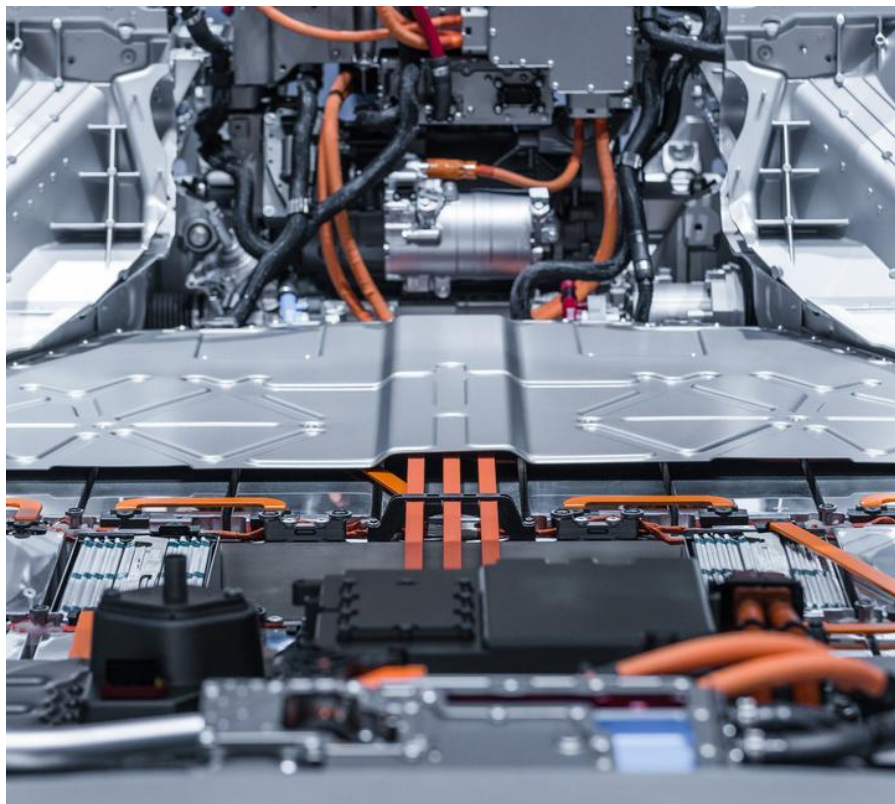
- **30+ years experience** vs 2–7 years experience
- **Multi-skilled** vs singular-skilled workers
- **Flexible work hours** vs fulltime requirements

SHORTER LAUNCH TIME

NO “SUPERVISORY” RESOURCES REQUIRED

HVM is currently supporting BEV, Hybrid, and battery manufacturing launches. We have many additional available contractors to support more programs simultaneously.

In the following cost comparison table, HVM staffing scenario estimates up to a 63% lower project launch costs than typically planned and staffed by automotive OEM resources.



Example of Program Staffing Comparision

Automotive OEM vs HVM

Relative cost comparison to launch a single module of BEV or Battery Sub-Assembly (i.e., Battery Pack Assy. or Elec. Drive Unit, etc.)

	OEM with Minimal Experienced Team Members	Contractor A	Contractor B (HVM)
Average Experience of Launch Team Members	2 years	7 years	30+ years
Scenario Description	OEM utilizes minimally experienced local employees. Requires close supervision.	Contractor utilizes medium-experienced level local contractors. Requires some supervision.	Contractor utilizes highly experienced, skilled contractors. Requires no supervision.
Estimated Number of Team Members required	5.0	4.0	2.0
Hourly Cost Factor	0.8X	1.2X	1.75X
Supervisory Ratio Required	0.2X	0.1X	0.0X
Straight Time Hours Per Week	40	40	50
Overtime Hours Per Week	20	20	10
Overtime Cost Factor	1.5X	1.5X	1.25X
Total Launch Project Estimated Weekly Cost Factor	350	328	200
Estimated Length of Project (Weeks)	39	35	35
Total Estimated Staffing Cost to Launch Project-X including Management Fees	13,650	11,480	8,012

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Core Areas of Focus



Our Commitment:

We aim to create long-term growth for our clients with high-value manufacturing solutions, by employing world class manufacturing experts passionate about helping peer manufacturers build quality products while increasing profits. Our values drive our desire to provide exceptional, unmatched value in every client project. They shape the culture of our company and serve as a baseline for how we operate.

Original Equipment Manufacturers and Component Suppliers

High Value Manufacturing works with Original Equipment Manufacturers (OEMs) & Tier 1/2/3 suppliers in automotive, aerospace, and defense industries to increase productivity, cut costs, and generate cash to the bottom line.

We believe that manufacturing companies need to be lean and quick to change to thrive in today's global economy. Every client engagement centers around improvements that lead to increased profitability. Our team focuses on:

- Producing the highest quality products
 - Improving throughput
- Maintaining cost effective operations
 - Compliance to industry standards
 - Supply Chain Engagement
- Supplier Quality Support (APQP)

At HVM, our service model is based on the 11+1 Quality Management Strategies, with short-term tasks that create immediate results. Our team applies a variety of tools and best practices to customize low-cost services that deliver value while achieving client goals.

Compliance/Quality Support

Whether your company is looking to simplify internal processes, reduce manufacturing costs, or streamline supplier relationships, HVM has the know-how and experience to develop your path to compliance. Applying the quality principles of Advanced Product Quality Planning (APQP), HVM skillfully integrates quality standards into manufacturing processes.

Implementing a comprehensive path to compliance can eliminate crisis management, increase new business opportunities, enhance product quality, reduce waste, and improve overall efficiency.



On-Shoring & Plant Launch

HVM understands manufacturing operations and the value of supply chain resiliency. Migrating a company's operations closer to the customer may be the best solution for quickly meeting and servicing U.S. market needs. Relocating plant operations has the potential to reduce costs, improve efficiencies, and allow more flexibility for addressing supply chain issues. To remain competitive in the automotive industry, converting a business model from solely servicing Internal Combustion Engine (ICE) Vehicles to also servicing BEV/Hybrid sector needs is necessary.

Operational Assessments, Performance Improvements, and Stakeholder Support

HVM applies manufacturing expertise to a fine-tuned operational assessment protocol that quickly identifies causes of inefficiencies and opportunities to build value for the company.

HVM's Quick Value Tool goes beyond standard financial metrics to investigate manufacturing issues that impact profitability.

When adding a new product or plant through an acquisition, HVM is equipped to work with clients that are considering purchasing or selling a manufacturing facility. As part of due diligence, a company should always include a manufacturing operations assessment in the early stages of the acquisition process. Our team provides various manufacturing assessments to ensure a business transaction provides maximum value.

Skilled Labor Resources:

HVM's team of highly experienced, highly capable resources has a variety of specialized skills that are available to manufacturing clients at competitive rates. Our contractor resources have 30 plus years of manufacturing experience, primarily in the automotive industry. HVM provides dedicated full-time contractors for short term or supplemental placements, as well as fractional coverage of jobs requiring less than 40 hours per week. HVM team members easily integrate into clients' existing teams and hit the ground running.

Our labor resources currently supporting battery manufacturing and BEV assembly operations possess experience and knowledge including new program launch, equipment design & installation processes, debug, equipment qualification, problem solving & exceptional two-way communication.

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BEV Experience

Cost, Value, and Risk Reduction (for OEMs)

As battery manufacturing and BEV/Hybrid assembly operations scale to meet growing demand, manufacturers must focus on maintaining low operational costs and minimizing risk. They will be able to create value with efficient operations led by skilled manufacturing resources with knowledge of continuous improvement and compliance with industry standards. There must be a strategic (and well-documented) approach to process, design, quality, costs, learning, and continuous improvement.



Well-Integrated Product Design and Manufacturing Process Development Technique (for Supply Chain)

The complexity of battery design poses a challenge to the manufacturing and vehicle assembly processes. Notwithstanding the availability and limited sourcing of raw materials for battery manufacturing, seamless production throughput and acceptable product quality requires multiple learning cycles, process validation through documentation, testing, and process control measures.

HVM's resources are actively engaged in critical positions for PPAP, PFMEA, PCP, and FMEA+ applications within a BEV assembly facility to integrate a "Design for Manufacturing" approach when working with battery manufacturing suppliers.



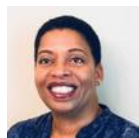
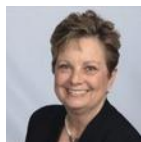


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HVM clients have reported that utilizing two (2) experienced HVM contractors is equivalent to five (5) less-experienced resources from other providers. HVM provides Supplemental Short-Term Resources to assist with specific project activities, including the following tasks, in part:

- **Program/Project/Launch Management**
- **Process Engineering**
- **Industrial Engineering**
- **Manufacturing Management**
- **Plant Layout/Facility Support**
- **Capacity Planning**
- **Systems and Feasibility Studies**



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Perspectives

Search the High Value Manufacturing blog at <https://highvaluemanufacturingconsulting.com/blog/> to learn about the expertise, philosophies, and qualifications of our highly experienced team of manufacturing professionals. The blog features personal stories from HVM leaders and team members about process improvements in action and lessons learned during lengthy careers on manufacturing plant floors. Among the complex, diverse topics in the blog library are:

PLANT LAUNCH PREPAREDNESS

Every member of the HVM leadership team has 25+ years of manufacturing experience that includes numerous new plant start-ups and new product launches. See *"Are you ready to launch?"* and *"What to look for in an automotive consulting firm"*.



OPERATIONAL ASSESSMENTS

HVM can perform a 3–5–day assessment of manufacturing operations to generate a "roadmap" on how to lower costs and improve profitability. See *"A Case for Outside Evaluation"* and *"Win-Win for Company & Investor"*.



LEAN MANUFACTURING

HVM understands the necessity of implementing lean manufacturing principles into operations and has the experience for immediate results. See *"Growing Up 5S"* and *"Do you fear manufacturing audits?"*



For examples of HVM projects in client facilities, review our Case Studies at: <https://highvaluemanufacturingconsulting.com/case-studies/>.

HIGHLY SKILLED LABOR RESOURCES

HVM's network of retired manufacturing professionals provides an array of specialized skills sets that may be a supplemental resource solution to keep production on schedule. See *"Specialized Skills to Meet Client Needs"* and *"Manufacturing's Best Solution for Staffing Challenges"*.



INVENTORY MANAGEMENT

There are best practices for inventory controls, but there are also unique and creative solutions that can be successful. See *"Inventory Control: Where did it go?"* and *"Inventory Control: Did I get it?"*



SUPPLIER RELATIONSHIPS

If your company sources suppliers that are adversely impacting your business, HVM can provide direct inter- vention to quickly resolve issues and create a mutually beneficial working relationship through shared goals. See *"Whistling Past a Graveyard That Never Ends"* and *"Production Closer to the U.S. Customer"*.



QUALITY MANAGEMENT

HVM's approach to quality is understanding and demonstrating the segment of the client. This is based on working from the ground up of the supplier. It focuses on safety, reliability of products, while reducing costs and ensuring customer satisfaction.



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Meet the Experts



BILL MAY

founded HVM in 2014 to share his knowledge and experience with manufacturers and manufacturing stakeholders who seek to improve operations and become more profitable. During his long career in manufacturing, Bill has worked with industry giants like General Motors and Ford, at facilities across the U.S. and internationally. As a manufacturing industry thought-leader, Bill has led the HVM Leadership Team to adapt to changes in the Manufacturing Sector, such as launching “HVM Resiliency Partners” to address supply chain issues impacting client facilities.

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DON GAUTHIER

is Lead of Automotive | Manufacturing Strategies Director. Don possesses over 42 years of expertise in manufacturing operations, engineering, program launch, maintenance, quality, and facility management. He has worked with General Motors in multiple facilities and states throughout his career gaining valuable experiences in Foundries, Powertrain Engine Machining & Assembly, Vehicle Assembly, Stamping, Body Shop, Paint & Polymers.

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Why choose HVM?

