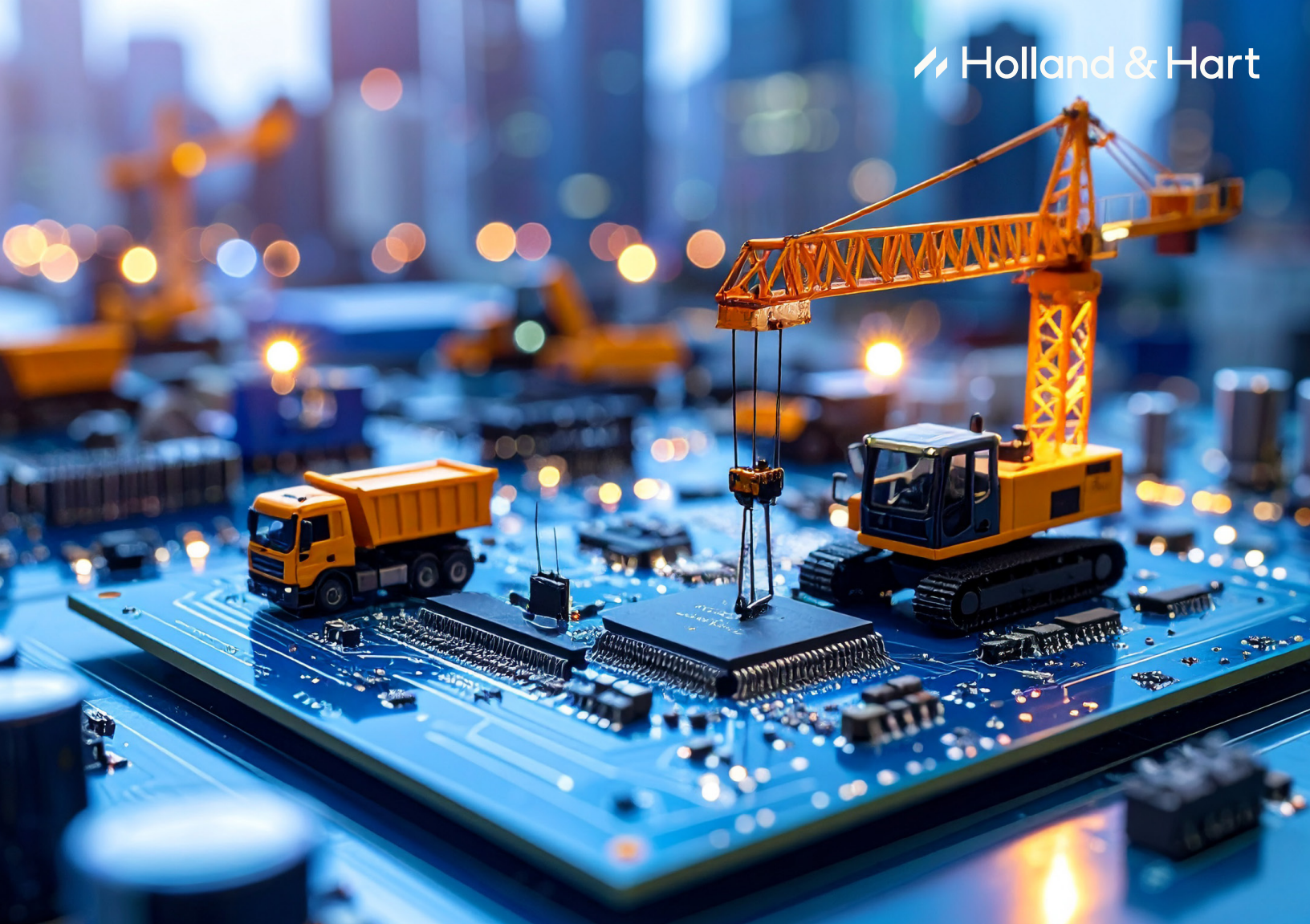




Strategic Procurement in the Semiconductor Industry: Best Commercial and Legal Practices for Large Enterprises

Create Supply Chain Resilience to Mitigate Risk

Adopt a multi-sourcing supplier strategy, maintain qualified backup vendors across geographic regions, and prioritize by risk. Audit all new suppliers up front.

Master Supply Agreements Provide Protection

Use structured MSAs with standardized key terms and clauses that clearly address force majeure, indemnification, IP rights, and dispute resolution.

Leverage Digital Tools to Drive Excellence

Integrate ERP systems with P2P platforms. Deploy AI-powered performance analytics. Use supplier portals and SRM platforms. Use e-sourcing and e-auctions for suppliers.

Build Cross-Disciplinary, Collaborative Teams

Multi-disciplinary procurement teams bring holistic perspectives, are more agile, and support good decision-making. Invest in procurement professionals obtaining industry certifications.

Establish and Track Key Performance Indicators

Core KPIs provide internal accountability and reinforce how procurement can advance corporate sustainability. Use data in external benchmarking to gain competitive insights.

Strategic Procurement in the Semiconductor Industry: Best Commercial and Legal Practices for Large Enterprises

BY GREG GILBERT

In the high-stakes world of semiconductor manufacturing, where technology evolves rapidly and supply chains span the globe, procurement is more than a functional necessity—it is a strategic engine. The procurement department at a large semiconductor company is not only responsible for sourcing raw materials, machinery, and services but also for navigating legal risks, ensuring compliance, and securing the company's long-term operational and competitive viability.

This article explores the best commercial and legal practices for procurement departments operating in the semiconductor industry. It draws on principles of strategic sourcing, supply chain management, risk mitigation, contract law, regulatory compliance, and digital transformation, offering a comprehensive roadmap for procurement leaders seeking to modernize and future-proof their organizations.

The Role of Procurement in the Semiconductor Sector

The semiconductor industry is uniquely sensitive to procurement performance due to:

- **High capital intensity:** Equipment and materials are expensive and highly specialized.
- **Supply chain complexity:** Global networks with multiple tiers of suppliers, often located in geopolitically sensitive regions.
- **Demand volatility:** Market cycles and geopolitical shocks can lead to shortages or overcapacity.
- **Regulatory scrutiny:** Export controls, trade compliance, and environmental regulations create complex legal environments.

Best Commercial Practices in Semiconductor Procurement

To ensure the successful procurement of goods, procurement teams must utilize strategic sourcing and analyze supplier qualifications. Once the bid process is complete, owners should carefully consider contract terms to ensure compliance with applicable laws and regulations, as well as environmental, societal, and governance (ESG) standards. Collaboration with R&D, engineering, legal, and finance teams, as well as risk and continuity planning is essential for the procurement process.

STRATEGIC SOURCING AND SUPPLIER SELECTION

Adopting a multi-sourcing strategy to avoid over-reliance on a single supplier is integral to the procurement process, especially for mission-critical components such as photoresists, specialty gases, and silicon wafers. Supply chain resilience demands options, and dual or multi-sourcing approaches should be pursued wherever feasible. Equally important is supplier segmentation and prioritization. Not all vendors

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are created equal—segmenting them based on criticality, risk, and value allows a company to focus its energy and investments where they matter most. Strategic partnerships with key suppliers can provide stability and innovation, while developing a bench of second-tier suppliers helps ensure flexibility in times of disruption. Short-sighted cost analysis can greatly cost procurement teams in the long run.

The focus should shift from unit price to total cost of ownership (TCO), which encompasses shipping, tariffs, lead times, reliability, and quality assurance. Procurement teams must be closely aligned with the company's technology roadmap. Understanding the trajectory of design nodes, the implications of EUV lithography, and the demands of advanced packaging is essential for making informed sourcing decisions that support both innovation and execution over the long term.

SUPPLIER QUALIFICATION AND AUDITS

Owners should conduct comprehensive due diligence before onboarding new suppliers by requiring detailed technical and financial assessments that include factory audits and quality certifications (e.g., ISO 9001, IATF 16949). Key performance indicators such as on-time delivery, defect rates, and responsiveness can be utilized for ongoing performance monitoring. Owners can also implement scorecard reviews, quarterly business reviews (QBRs), and annual compliance audits to support continuous improvement. Suppliers should be vetted for sanctions, export control compliance, and ethical labor practices.

CONTRACTING AND NEGOTIATION STRATEGY

In the highly specialized and capital-intensive semiconductor sector, a well-structured contracting and negotiation strategy is essential to mitigate risk, ensure supply continuity, and protect intellectual property. A foundational best practice is the use of Master Supply Agreements (MSAs) and long-term framework contracts. These agreements should incorporate embedded pricing models, escalation and de-escalation mechanisms tied to market indices, and clear performance guarantees. Such provisions provide both parties with predictability while allowing necessary flexibility in response to evolving market conditions.

Effective negotiation planning is equally critical. Cross-functional collaboration—particularly between legal, engineering, and procurement—is imperative to ensure that all technical, commercial, and compliance considerations are accounted for before engaging with suppliers. These teams should proactively address issues such as volume flexibility, exclusivity rights, and robust intellectual property protections, which are often at the heart of semiconductor supply arrangements.

To drive consistency and reduce contracting cycle times, companies should invest in the standardization of key contractual terms. Developing a clause library covering core provisions—such as indemnity, limitation of liability, force majeure, and governing law—promotes uniformity across supplier agreements and mitigates legal exposure. Standardized language also enhances internal alignment and reduces negotiation friction, ultimately contributing to a more efficient and risk-resilient procurement function.

Legal Best Practices for Procurement Operations

CONTRACT FORMATION AND DOCUMENTATION

Companies should avoid informal arrangements or verbal commitments, which can lead to ambiguity and legal exposure. All POs should be formally incorporated into either signed MSAs or standalone contracts that include comprehensive integration clauses to ensure consistency and enforceability. Risks posed by the “battle of the forms” under UCC § 2-207 should also be considered. According to this doctrine, conflicting terms between POs and supplier invoices may still result in a binding contract with unintended terms.¹ Proactive management

¹ UCC § 2-207.

of standard forms and careful review of inbound and outbound terms are essential to avoid such pitfalls. Implementing compliant electronic contracting systems that meet the standards of the E-SIGN Act and UETA is imperative.² Such systems should include secure, auditable records of contract acceptance, performance, and any modifications, enabling clients to maintain legal defensibility while improving operational efficiency.

KEY CLAUSES AND LEGAL PROTECTIONS

Comprehensive procurement processes aid in contract drafting and ensure all parties are protected. The following clauses must be included in all contracts related to procurement.

- **Force Majeure and Business Continuity:** Draft force majeure clauses that include pandemics, geopolitical instability, and export bans. Require suppliers to have documented continuity plans.
- **Indemnification and Insurance:** Negotiate indemnity clauses for product defects, delays, and regulatory violations. Ensure vendors carry adequate liability, property, and cyber insurance.
- **IP Rights and Confidentiality:** Protect proprietary designs, manufacturing processes, and trade secrets with strong NDA provisions and IP ownership clauses.
- **Dispute Resolution:** Specify jurisdiction, governing law, and preferred method (e.g., arbitration vs. litigation). International arbitration may be preferred for cross-border relationships.

² UETA, *Unif. Elec. Transactions Act* (Nat’l Conf. of Comm’rs on Unif. State Laws 1999); E-SIGN Act, *Electronic Signatures in Global and National Commerce Act*, 15 U.S.C. §§ 7001–7031 (2022)

REGULATORY AND TRADE COMPLIANCE

Procurement must collaborate with trade compliance teams to ensure goods and technology transfers comply with U.S. Export Administration Regulations (EAR) and International Traffic in Arms Regulations (ITAR). In addition, procurement teams should conduct tariff classification analysis, country of origin tracking, and documentation audits to ensure import compliance. This is increasingly important as the nature of tariffs changes frequently. Procurement teams should also implement supplier codes of conduct consistent with the Foreign Corrupt Practices Act (FCPA) and equivalent local laws.

Risk Management in Semiconductor Procurement

SUPPLY CHAIN RESILIENCE

For high-risk materials such as advanced photoresists and rare gases, the procurement team should maintain safety stock and dual-source from geographically diverse regions. In addition, tier 2 and tier 3 visibility is imperative to detect upstream bottlenecks or sanctions exposure. Digital supply chain mapping tools help with real-time tracking of these potential issues. The procurement team can run risk simulations based on earthquakes, trade embargoes, and demand surges to analyze supply chain resiliency.

CYBERSECURITY AND DATA RISK

The procurement team should assess cybersecurity policies of suppliers, particularly for critical tools with embedded firmware or remote diagnostic systems. It is imperative that owners ensure the contract restricts suppliers' access to operational data and defines clear ownership of process and manufacturing data to protect their intellectual property.

Operational Excellence and Technology in Procurement

Operational excellence in procurement hinges on the strategic deployment of advanced digital tools and technology platforms. A foundational element is the integration of Enterprise Resource Planning (ERP) systems with Procure-to-Pay (P2P) platforms. This alignment not only

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streamlines approval workflows and enhances auditability but also ensures timely and accurate supplier payments, a critical component in the high-stakes semiconductor supply chain. To drive informed decision-making, procurement teams are increasingly leveraging AI-powered spend analytics and dashboards, enabling real-time insights into supplier performance, cost trends, and contract compliance.

Further enhancing operational efficiency are centralized supplier portals, which simplify onboarding, facilitate secure document exchange, and enable consistent performance monitoring. Complementing these tools, Supplier Relationship Management (SRM) platforms foster strategic collaboration with key vendors—an essential practice in managing the complex and often global supplier base typical of semiconductor manufacturing.

Additionally, the use of e-sourcing and e-auction technologies has become a best practice in achieving procurement agility and cost optimization. Digitalizing sourcing events such as Requests for Quotations (RFQs) and Requests for Proposals (RFPs) increases transparency, accelerates turnaround times, and supports competitive pricing through standardized templates. For more commoditized categories,

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reverse auctions—with clearly defined quality and delivery benchmarks—offer a powerful mechanism for securing favorable pricing while maintaining essential performance standards. Collectively, these digital strategies form the backbone of a high-performing procurement function capable of supporting the demanding needs of semiconductor projects.

ESG and Sustainable Procurement

The procurement team should ensure the supplier's commitment to sustainability and ethical practices is reflected in its approach to environmental stewardship, social responsibility, and governance. Suppliers should utilize green procurement standards such as energy efficient materials, low-emission logistics, and recyclable packaging in the sourcing criteria. Additionally, owners should require suppliers to report on Scope 1 and Scope 2 emissions and provide lifecycle assessments of their products to support carbon reporting initiatives.

In terms of social responsibility, the procurement team can evaluate the supplier's labor and human rights initiatives by auditing suppliers for

compliance with international labor standards. During the negotiation phase, owners should prohibit forced labor and child labor through binding contractual clauses. Owners can also promote diversity and inclusion by encouraging sourcing from minority- and women-owned businesses and setting targets for diversity-related spending.

To establish transparency through governance, suppliers should strictly adhere to a corporate Supplier Code of Conduct, supported by periodic training and audits as part of supplier ethics programs. Moreover, suppliers must have effective whistleblower and grievance mechanisms in place, including anonymous reporting systems and protections for whistleblowers.

Organizational Structure and Talent Development

ORGANIZATIONAL STRUCTURE

In the semiconductor industry, where supply chains are complex and competition is relentless, organizational structure and talent development are critical to elevating procurement as a strategic function. A key enabler is cross-functional collaboration, which involves establishing integrated procurement teams aligned with specific product lines. These teams, or “pods,” bring together stakeholders from engineering, finance, and legal, ensuring that procurement decisions are technically sound, financially prudent, and legally compliant. To reinforce the strategic value of procurement, it is essential to secure executive sponsorship, embedding procurement leadership within the C-suite dialogue and aligning sourcing priorities with overall corporate objectives.

TALENT MANAGEMENT

Equally important is a robust approach to talent management. Forward-thinking semiconductor companies are investing in the continuous

development of their procurement professionals by encouraging attainment of industry-recognized certifications such as the Certified Professional in Supply Management (CPSM) and the Chartered Institute of Procurement & Supply (CIPS). These credentials help ensure that procurement personnel possess both the technical expertise and the strategic acumen required for high-stakes sourcing decisions. Moreover, the implementation of rotational programs across procurement, legal, compliance, and operations functions fosters a well-rounded, cross-disciplinary perspective. This holistic exposure is instrumental in building a procurement organization that is not only technically proficient but also agile, collaborative, and aligned with the broader goals of the enterprise.

Benchmarking and Performance Measurement

KEY PERFORMANCE INDICATORS (KPIs)

Procurement teams must establish and track a comprehensive set of Key Performance Indicators (KPIs) to ensure alignment with organizational objectives and supply chain resilience. Core KPIs should include cost savings and cost avoidance metrics, supplier on-time delivery rates, contract compliance levels, and the effectiveness of risk mitigation strategies. In today's regulatory and investor environment, tracking environmental, social, and governance (ESG) performance through scorecards is equally critical, reinforcing the strategic role procurement plays in advancing corporate sustainability goals.

EXTERNAL BENCHMARKING

Beyond internal metrics, external benchmarking provides valuable context and insight.

Procurement leaders should compare their performance against recognized industry standards, drawing on resources such as the Gartner Supply Chain Top 25 or the Deloitte Global CPO Survey. These benchmarks help identify performance gaps and best practices across the sector. Additionally, active participation in industry consortiums such as SEMI (Semiconductor Equipment and Materials International) and the Global Semiconductor Alliance (GSA) facilitates peer-to-peer collaboration, knowledge sharing, and continuous improvement. Together, these measurement and benchmarking practices enable procurement teams to remain competitive, agile, and aligned with the dynamic demands of the semiconductor ecosystem.

Conclusion

In an industry where nanometers matter and market dynamics shift in seconds, procurement is no longer a back-office function—it is a strategic powerhouse. For large semiconductor companies, adopting best-in-class commercial and legal procurement practices means building resilient supply chains, negotiating enforceable and fair contracts, and driving sustainable innovation.

As procurement departments navigate geopolitical uncertainty, evolving technology, and stricter regulatory environments, success will depend on their ability to adapt, collaborate, and lead. The future of semiconductor competitiveness will, in part, be written by those who master the art and science of procurement.



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