BUSINESS SWEDEN
THE SWEDISH TRADE & INVEST COUNCIL

APPENDIX 2:

EXPANDING SWEDEN'S NUCLEAR SUPPLIER BASE FROM ADJACENT INDUSTRIES

This is an appendix to Business Sweden's main report delivered in June 2026

EXECUTIVE SUMMARY

This report assesses how the Swedish and broader Nordic adjacent-industry supplier base can be qualified into nuclear at the scale required by the Swedish and Nordic–Baltic build-out. Multiple initiatives are driving demand: plans for early SMR deployment, multi-reactor campuses, and advanced reactor projects. Together, these point to a need for a qualified regional supply chain. The alternative, continued dependence on a small number of legacy nuclear suppliers concentrated outside the EU, defines the baseline risk.

Adjacent industries across Sweden and the Nordic region hold capabilities that align directly with nuclear requirements, including specialty steel, aerospace precision manufacturing, offshore engineering, marine fabrication, medical devices, and heavy industrial equipment. Many companies already operate to standards (RCC-M, ASME, NORSOK, AS9100, DNV, ISO 13485) that share core elements with nuclear quality codes. Qualification gaps are therefore bounded: typically 6–18 months for the most advanced sectors and 2–4 years for others. The gap assessment shows that a meaningful share of nuclear value-chain CAPEX sits in scopes that Nordic industry could plausibly serve.

A key observation is that the SMR paradigm aligns well with Nordic industrial strengths: modular construction from shipbuilding, precision components from aerospace and med-tech, smaller pressure vessels within existing fabrication capabilities, and heat-exchange expertise from district heating. The analysis covers 24 Nordic adjacent-industry companies, mapped across three readiness tiers, five already nuclear-qualified, seven high readiness (1–2 years), and twelve medium readiness (2–4 years). The report also draws on precedents such as the UK Fit4Nuclear programme, Finland's FinNuclear network, and the EU Nuclear Industrial Alliance as models for a Swedish approach.

Sweden itself has limited oil and gas capability. In contrast, the Norwegian offshore sector represents a deep source of transferable expertise within the Nordic region and is therefore treated as part of the broader supply opportunity. Med-tech, by comparison, is a distinct Swedish strength.

1. ADJACENT SECTORS WITH TRANSFERABLE CAPABILITIES

Steel and specialty metals

Transfer potential: Very High. Sweden's specialty steel sector is already part of the global nuclear supply chain. Alleima (formerly Sandvik Materials Technology) holds a long-running position in nuclear cladding and SG tubes and complies with RCC-M. In January 2025 Alleima received a SEK 530 million order for nuclear steam generator tubes.

SSAB is Scandinavia's only integrated plate steelworks, operating ASME and NORSOK-aligned production lines for offshore use. Outokumpu's Avesta works (the original developer of duplex stainless steel) supplies thick and wide plates suitable for spent-fuel storage casks, condensers, and waste-handling structures. Ovako produces clean specialty steels for bearings and engineering applications. SKF, while best known for bearings, depends on Ovako's rolled steel and is itself embedded in nuclear supply chains through reactor coolant pump bearings.

The key gap for material suppliers is nuclear-specific material qualification under ASME Section II / III or RCC-M, which requires extensive testing documentation and traceability beyond standard PED requirements. For SMR builds using smaller components, Nordic forging and plate capabilities are sufficient for most non-RPV pressure-boundary parts; the very heavy forgings (RPVs, large pressurizers, SG vessels) remain a concentrated international scope.

Oil and gas, Norway's capabilities for the Nordic build-out

Transfer potential: Very High. Sweden itself has limited oil and gas industry capability. Norway's offshore sector, however, represents one of the most transferable capability bases globally and is a natural partner for Sweden's nuclear build-out within a Nordic strategy.

NORSOK standards require material traceability, welding procedure qualification, and QA / QC systems that closely parallel nuclear requirements. Aker Solutions (~12,000 employees) brings EPC capability and heavy fabrication yards at Stord and Verdal, translatable to nuclear plant construction and modular fabrication. TechnipFMC's Norwegian operations are well placed in subsea valve systems and precision process technology, and IKM Group is Norway's leading NDT provider with mechanical-completion and commissioning experience.

The gap from NORSOK / DNV to nuclear is moderate: companies need a nuclear QA overlay (NQA-1 or ISO 19443), nuclear-specific material documentation, and safety classification protocols. Arv Energy AS (Stavanger) was explicitly founded to connect Norway's offshore industrial expertise with nuclear.

Aerospace and defence

Transfer potential: High. Aerospace quality systems (AS9100) are structurally close to nuclear quality requirements (ISO 19443), both are sector-specific adaptations of ISO 9001 emphasising traceability, configuration management, and safety culture. GKN Aerospace Sweden (Trollhättan, ~2,000 employees) operates superalloy precision machining at tight tolerances, additive manufacturing, and laser welding, applicable to nuclear safety-class precision components and primary-circuit auxiliary parts.

Saab's defence divisions (Linköping / Karlskrona) bring submarine construction welding, defence-grade I&C and sensors, and cybersecurity capability that can translate into nuclear physical-security and digital-twin scopes. Trelleborg's US subsidiary already holds 10 CFR 50 for nuclear seals and gaskets, providing a working bridge for the Swedish parent. Kongsberg Gruppen (Norway) supplies defence-grade sensors, autonomous inspection systems, and digital twins.

The gap is among the smallest of any sector, typically 6–12 months for a well-prepared aerospace firm to layer nuclear-specific safety culture, ITNS determination, and CFSI prevention onto an existing AS9100 system.

Marine, shipbuilding, and the SMR advantage

Transfer potential: High, especially for SMRs. Modular block construction, pioneered in Nordic shipbuilding, is directly applicable to SMR modular construction methods. DNV classification, headquartered in Norway, follows a third-party verification model similar to the Authorised Nuclear Inspector framework. Konecranes is nuclear-qualified for polar cranes and fuel-handling machines, demonstrating that the marine-to-nuclear bridge is workable. Wärtsilä has historically supplied emergency diesel generators to nuclear plants and retains the engineering base to re-enter that market. Kockums and Aker Solutions hold the heavy-fabrication yards needed for SMR module assembly.

The SMR paradigm makes this sector particularly relevant. Unlike LSRs, where the limiting components are very large forgings and on-site civil works, SMRs are designed for factory-based modular assembly. A Nordic SMR module factory is one of the more plausible structural opportunities in the wider programme.

Medical devices and life sciences

Transfer potential: High. Med-tech is a Swedish strength and a structurally close analogue to nuclear from the quality-system perspective. The medical device standard ISO 13485 is, like AS9100 (aerospace) and ISO 19443 (nuclear), a sector-specific overlay on ISO 9001, sharing the same core structure of design control, configuration management, validated processes, full material and component traceability, supplier qualification, risk management (ISO 14971), and a documented design history file. The cultural and procedural bar for safety-critical, regulated, traceable manufacturing is already part of how med-tech firms operate.

Sweden has substantial industrial depth in this sector: Mölnlycke Health Care (in surgical devices; Getinge, in sterilisation, infection control, and life-support systems with pressure-vessel and fluid-system engineering experience; Elekta building radiation oncology and stereotactic systems with high-precision mechatronics and radiation-handling expertise; Arjo in medical mobility equipment and infection prevention; Boule Diagnostics in in-vitro diagnostics; and the AddLife group of medical-device SMEs. Behind these system OEMs sits a base of contract manufacturers, precision machinists, polymer and silicone moulders, sterile-packaging firms, and implant suppliers operating to ISO 13485.

The certification gap is small to moderate. Companies moving from ISO 13485 to ISO 19443 already have ISO 9001, configuration management, traceability, and a regulator-engagement culture; the additions needed are nuclear safety culture, ITNS (Items Important to Nuclear Safety) determination, the graded approach, and CFSI (Counterfeit, Fraudulent, Suspect Items) prevention. For firms targeting precision-machined metallic parts (pump internals, valve internals, instrumentation feedthroughs), the bridge is comparable to AS9100 → ISO 19443: typically 6–12 months for the QMS overlay and a further 12–24 months for component-level qualification within an OEM vendor list. For firms targeting SMR-relevant scopes specifically, radiation instrumentation and sensors (Elekta, Boule), high-purity fluid-handling components (Getinge), and sterile-packaging-derived clean-area assembly capability, the path is shorter still.

Other sectors with meaningful transfer potential

Pulp and paper equipment manufacturing has deep Swedish roots, with recovery boilers operating in conditions that parallel nuclear steam system conditions. Deform AB previously manufactured pressure vessels for Sweden's nuclear expansion and maintains PED-related fabrication capability.

District heating expertise transfers directly to nuclear cogeneration, a key use case for Nordic SMRs. Alfa Laval already delivers heat exchangers certified to nuclear safety class 2 for both large reactors and SMRs. Danfoss (Denmark) brings HVAC controls and valves with relevance to nuclear-island ventilation and SMR cogeneration.

Mining and heavy industry contributes underground construction expertise (relevant to spent-fuel repositories, SKB is building one at Forsmark), remote and automated operations, and ventilation systems. LKAB operates the world's largest underground iron ore mine. FLSmidth (Denmark) brings heavy industrial equipment manufacturing at scale.

Petrochemical and refinery sectors offer process engineering, SIL-rated safety-instrumented systems (IEC 61508 / 61511 paralleling nuclear safety classification), and turnaround / outage management analogous to nuclear refuelling outages.

Sector comparison overview

Adjacent Sector	Transfer Potential	Key Transferable Capabilities	Existing Certifications	Gap to Nuclear
Steel & Specialty Metals	Very High	Nuclear fuel tubes, SG tubing, structural plate, specialty stainless	RCC-M, ASME Sec II, PED	Low–Medium
Oil & Gas (Norway)	Very High	Heavy fabrication, EPC, pressure vessels, NDT, commissioning	NORSOK, DNV, ISO 9001	Medium
Aerospace & Defence	High	Precision machining, additive mfg, I&C, pressure-hull welding	AS9100, NADCAP, AQAP	Low–Medium
Marine & Shipbuilding	High (esp. SMRs)	Modular construction, DNV class, heavy steel fab.	DNV, ISO 3834	Medium
Medical Devices & Life Sciences	High	Precision machining, traceable QA, radiation handling, sterile / clean assembly	ISO 13485, ISO 14971, MDR	Medium
Pulp & Paper Equipment	Medium–High	Pressure vessels, heat exchangers, high-T corrosive env.	PED, EN 13480	Medium–High
Mining & Heavy Industry	Medium	Underground construction, remote ops, ventilation, heavy lift	ISO 9001, mining standards	High

Table 1, Sector-by-sector comparison of nuclear supply chain transfer potential.

2. SUITABILITY AND READINESS OF CANDIDATE COMPANIES

Nuclear-grade technical requirements

Companies seeking to enter the nuclear supply chain must meet a hierarchy of standards depending on the safety significance of their products. The primary frameworks are: ISO 19443 (nuclear supply chain quality management, an extension of ISO 9001); ASME Section III (nuclear pressure vessels and piping, US-based but widely accepted internationally); RCC-M (the French nuclear construction code, used for EPR and EPR2); NQA-1 (North American nuclear quality assurance); and the German KTA standards. Sweden's SSM-recognised projects commonly use ASME III, RCC-M, and KTA codes for safety-classified equipment, and ISO 19443 for the supply-chain QMS

Certification gaps by starting point

From AS9100 (aerospace) to ISO 19443 (nuclear), one of the more transferable starting points. Both are ISO 9001-based with sector-specific overlays. The primary additions for nuclear are nuclear safety culture requirements, systematic determination of Items Important to Nuclear Safety (ITNS), a graded approach to safety classification, and CFSI prevention. Timeline: 6–12 months for well-prepared aerospace firms.

From ISO 13485 (medtech) to ISO 19443, also a short bridge. The shared structure (ISO 9001 + sector overlay), the regulator-engagement culture, configuration management, full traceability, and risk-management discipline are already in place. Additions for nuclear are again nuclear safety culture, ITNS determination, the graded approach, and CFSI prevention. Timeline: 6–12 months for the QMS overlay; 12–24 months for component-level qualification on a Tier 0 OEM vendor list.

From NORSOK / DNV (oil and gas) to nuclear, moderate gap. NORSOK / DNV standards share emphasis on material traceability and fatigue analysis with nuclear codes, but lack nuclear safety classification (Class 1 / 2 / 3) and the ASME Section III or NQA-1 framework. Timeline: 12–18 months for ISO 19443; commonly 2–3+ years years for ASME N-stamp.

From ASME Section VIII to ASME Section III, major gap requiring QA-system overhaul to full NQA-1 compliance, engagement of Authorised Nuclear Inspectors, nuclear-grade material procurement with full heat-lot traceability, and a shift from design-by-rule to design-by-analysis for Class 1 components. Timeline: 2–5 years.

Investment requirements for nuclear entry

Total investment for an SME entering nuclear supply I estimated to range from $200,000 to $1,000,000 over 2–5 years, covering QA-system development, training, facility modifications, and certification costs. Larger companies targeting safety-classified components (ASME III Class 1, RCC-M Class 1) typically invest $1–5 million or more.

Investment line item	Timeline	Notes
ASME Section III code books	Day 1	Annual subscription; updates yearly
NQA-1 programme development (consulting)	6–12 months	Larger if multi-site
ISO 19443 certification audit	After 6–12 months QMS prep	In addition annual surveillance audits
ASME N-stamp application & survey	12–24 months	Includes ANI fees and ASME survey
Training (engineers, QA, welders, NDT)	Continuous	Per site; recurring at ~20% annual rate
Facility upgrades (clean areas, mat'l ctrl, traceability)	12–36 months	Highly site-specific
Welding procedure qualification (PQR / WPS)	6–18 months	Code-specific; per material / process
First-of-a-kind component qualification	12–36 months	Reactor-vendor dependent
Programme management & audit prep	Ongoing	Internal; scales with size

Table 2, Typical investment line items for nuclear supplier qualification.

Where new entrants should start

The nuclear supply chain operates on a tier hierarchy. Tier 0 (reactor vendors) and Tier 1 (major EPC contractors) present the highest barriers. Tier 2 (component and equipment suppliers) is achievable with targeted investment. Tier 3 (materials, sub-components, testing services) offers the lowest entry barriers. The entry barrier is lower for Balance of Plant (turbines, generators, condensers, cooling systems, HVAC, electrical) than for the primary circuit. The practical entry strategy is: start with ISO 19443, target a Tier 2 or Tier 3 BoP scope, qualify on a single OEM vendor list, then expand.

Company profiles, examples of Nordic companies positioned for nuclear entry

High readiness, 6–18 months to qualification

Company	Country	Transferable capability	Key certifications
GKN Aerospace Sweden	Sweden (Trollhättan)	Superalloy precision machining, additive mfg, laser welding, NDT	AS9100, NADCAP
Trelleborg	Sweden	Elastomer seals, O-rings for high-P / T; US subsidiary 10 CFR 50 App B	10 CFR 50 App B (Pawling US), ISO 9001, NORSOK
SKF	Sweden (Gothenburg)	Rolling bearings already in RCPs and turbines; condition monitoring	ISO 9001, ISO 14001, ISO 45001
Aker Solutions	Norway (Fornebu)	Heavy fabrication yards (Stord, Verdal); pressure vessels; subsea	ISO 9001, DNV, NORSOK
TechnipFMC (Norway)	Norway	Subsea valve systems, precision engineering	ISO 9001, API
Kongsberg Gruppen	Norway (Kongsberg)	Defence-grade sensors, digital twins, autonomous inspection	NATO AQAP, ISO 9001
Ringo Nordic	Sweden (SME)	Nuclear valve range; active at Swedish nuclear conferences	ISO 9001:2015
Getinge	Sweden (Gothenburg)	Sterilisation, infection control, life support; pressure vessels and high-purity fluid systems	ISO 13485, ISO 14971, MDR
Elekta	Sweden (Stockholm)	Radiation oncology and stereotactic systems; precision mechatronics; radiation handling	ISO 13485, IEC 60601, MDR
Mölnlycke Health Care	Sweden (Gothenburg)	Surgical devices; clean-room assembly; sterile packaging; medical-grade polymer / silicone	ISO 13485, MDR
Boule Diagnostics	Sweden (Stockholm)	In-vitro diagnostics, sensor and analytical instrumentation	ISO 13485, IVDR

Table 3, High-readiness companies

Medium readiness, 2–4 years to qualification

Company	Country	Transferable capability	Key certifications
SSAB	Sweden (Stockholm)	High-strength structural steel; only integrated plate steelworks in Scandinavia	ISO 9001
Atlas Copco	Sweden (Nacka)	Compressed air for instrument air; semiconductor-grade vacuum; torque	ISO 9001
Outokumpu (Avesta)	Finland / Sweden	Duplex stainless steel; thick / wide plate; super-alloy grades	ISO 9001, PED
Xylem / Flygt	USA / Sweden (Emmaboda)	Documented nuclear application (condensate / flood pumps)	ISO 9001
IKM Group	Norway (Sola)	Norway's leading NDT provider; mechanical completion; commissioning	NORSOK, DNV
Wärtsilä	Finland (Helsinki)	Emergency diesel generators previously supplied to NPPs	ISO 9001
Danfoss	Denmark (Nordborg)	HVAC controls and valves; district heating tech	ISO 9001
Deform AB	Sweden (Falun area)	Historical nuclear PV manufacturing; pressure vessel heads, formed components	PED
BVT Sweden	Sweden (Säffle)	Steam conditioning valves, pressure-reduction valves	ISO 9001
Saab (defence divs)	Sweden	I&C systems, sensors, cybersecurity, submarine welding	NATO AQAP, AS9100
Ovako	Sweden (Hofors)	Clean specialty steels for bearings and engineering applications	ISO 9001, IATF 16949
FLSmidth	Denmark (Copenhagen)	Heavy industrial equipment manufacturing at scale; large-scale civil works	ISO 9001

Table 4, Medium-readiness companies

3. BRIDGING THE GAP, FROM ADJACENT INDUSTRY TO NUCLEAR SUPPLY

The UK Fit4Nuclear model

The UK's Fit4Nuclear (F4N) programme, operated by the Nuclear Advanced Manufacturing Research Centre (Nuclear AMRC), has supported over 3,000 UK manufacturing companies in preparing for nuclear supply chain work. Companies undergo a self-assessment across strategy, design, people, process, health & safety, and quality management; receive tailored coaching and capability-building support; and are introduced to potential customers across the UK nuclear programme. F4N is the most directly relevant precedent for what a Swedish equivalent might look like.

Finland's FinNuclear network

Finland's FinNuclear association encompasses 100+ member companies covering the entire nuclear lifecycle, a mature ecosystem built through Olkiluoto 1, 2, and 3 plus the Onkalo spent-fuel repository. FinNuclear is the natural cross-border partner for any Swedish equivalent and the most mature near-neighbour ecosystem to learn from.

Finland's KELPO qualification-reform project

Beyond its supplier network, Finland has also examined the qualification process itself. The KELPO project, run since 2018 by Finnish Energy together with the licensees and the regulator STUK, proposed changes to make licensing and qualification practices more functional: wider use of the graded approach, greater use of standard equipment, a broader supplier base, and closer cooperation between license holders. Its first phase concentrated on mechanical equipment in lower safety classes, with the intention of informing EU-level qualification development.

The EU Nuclear Industrial Alliance

The EU Nuclear Industrial Alliance on SMRs, launched in February 2024 with 350+ stakeholders, aims to deploy first European SMRs by the early 2030s. Its September 2025 Strategic Action Plan covers supply-chain revitalisation, regulatory harmonisation, skills, and financing. Swedish suppliers stand to benefit from the Alliance's harmonisation work, particularly on cross-border qualification recognition; Swedish participation would likely be advantageous for many Nuclear-adjacent companies.

Nordic transitions already underway

Several Nordic transitions are already underway. Arv Energy is repurposing offshore expertise for nuclear, AFRY has secured an agreement with GE Vernova Hitachi for BWRX-300 in Europe, and Fortum is advancing early-works agreements with key vendors across Finland and Sweden. Aker Solutions' partnership with Rolls-Royce SMR highlights the shift of established engineering capabilities into nuclear, while Industrikraft's SEK 400 million consortium investment supports long-term offtake.These are working precedents; what is missing is a supplier-qualification programme that translates these into a scalable portfolio of qualified Swedish and Nordic firms.

4. CONCLUSIONS AND RECOMMENDATIONS

Sweden's adjacent industries, together with those of Norway and Finland, hold capabilities that map closely onto nuclear supply chain requirements. Several companies are already embedded in the global nuclear supply chain, and the broader Nordic industrial base possesses quality cultures and manufacturing competence sufficient to qualify into nuclear within reasonable timeframes. The strongest sectors, specialty steel, Norwegian offshore oil and gas, aerospace and defence, marine and shipbuilding, and medical devices and life sciences, share ISO 9001-derived quality systems that translate into ISO 19443 with a 6–18 month overlay rather than a multi-year rebuild.

While Sweden has deep capabilities in steel, aerospace, med-tech, and heavy industry, some of the most transferable expertise, particularly in offshore EPC and fabrication, sits in Norway. A Nordic-level supply chain strategy would therefore strengthen Sweden's position. The addition of med-tech as an active target sector materially expands the credible high-readiness portfolio and brings in capabilities (radiation handling, sterile-clean assembly, precision mechatronics) that the rest of the adjacent-industry portfolio cannot serve as well.

Recommended actions

- Establish a Swedish nuclear supplier qualification programme, modelled on the UK's Fit4Nuclear and adapted for the Nordic industrial context. RISE is a natural institutional host, with co-funding from Energimyndigheten and Vinnova. The initial cohort could comprise the high-readiness companies plus the med-tech additions (Getinge, Elekta, Mölnlycke, Boule), expanding to medium-readiness candidates in year two.
- Build a formal Nordic supply-chain coordination workstream linking Swedish, Finnish, and Norwegian industry through existing frameworks (Nordic Nuclear Forum, FinNuclear, Norsk Kjernekraft, Arv Energy). Norwegian offshore EPC and Finnish FinNuclear members are the most underused regional assets.
- Prioritise the high-readiness companies for early engagement, focusing first on those with existing nuclear-adjacent certifications (ASME U-stamp, AS9100, ISO 13485, RCC-M, DNV). The certification-discipline overlap is the strongest predictor of qualification speed.

Align timing with vendor selection. With Videberg Kraft’s final supplier selection in 2026 and FID 2028–2029, the qualification window is 3–5 years, matching the typical timeline for a well-prepared adjacent-industry firm to achieve nuclear qualification. Action would need to start in 2026.

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