nordnest

6. Technology & System Logic

World-Leading Technology - Built for Today, Ready for Tomorrow

6A: Factory-assembled, moisture-protected modules

One of the biggest weaknesses in conventional building projects lies in how installations are put together. In the traditional model, everything happens on the construction site: pipes are cut, ducts are fitted, cables are threaded, and fixtures are mounted - all in an environment that is inherently **unpredictable**. Weather delays, damp materials, rushed timelines, and multiple trades working on top of each other mean that mistakes are almost guaranteed.

These mistakes are not minor. **Moisture intrusion during construction**, for example, is one of the leading causes of insurance claims in Swedish housing. A poorly sealed joint, an exposed pipe, or a bathroom that gets wet before it is properly protected can lead to **costly damage** that may not even reveal itself until years later. At the same time, every improvised solution on site introduces **performance variation** - no two bathrooms or technical spaces end up being quite the same, which makes maintenance and troubleshooting harder down the line.

The core issue in the industry today is unpredictability. Projects are delayed because installations are still assembled manually by multiple subcontractors in uncontrolled site conditions - all while the availability of skilled labour in Sweden continues to shrink. Developers now demand predictable timelines, predictable costs, and predictable performance.

Even the most skilled installers cannot compensate for a flawed, site-built process. Traditional onsite construction simply cannot guarantee consistency - the only viable solution is factory production under controlled conditions.

Industrialisation is the only way to remove systemic installation risk. By shifting work to controlled factory settings, Ekonod reduces dependence on onsite craftsmanship and the labour shortages that challenge today's construction market.

Ekonod eliminates these risks by shifting the most complex, risk-prone part of the building process away from the site and into a **controlled factory environment**. Ekonod hubs are also significantly lighter - typically around one-third the weight of traditional prefab pods - reducing structural load, simplifying logistics, and expanding layout possibilities for architects. Each Ekonod hub is built like a technical engine room in miniature. It is assembled, sealed, and tested in the factory before ever leaving the floor. Workers are not battling rain, dust, or deadlines - they are following **standardized processes with precision tools and quality checks** at every step. Ekonod hubs can also integrate optional spillwater heat recycling, recovering 50–75% of shower-water energy before it leaves the apartment - a major efficiency upgrade built directly into the plumbing logic.

This factory-first approach brings three major benefits:

Moisture protection built-in.

Instead of arriving as raw materials that must be assembled and sealed under uncertain site conditions, the modules leave the factory already **dry and moisture-protected**. Bathrooms and wet rooms - traditionally the riskiest spaces in any building - arrive **safeguarded against one of the industry's most common and expensive problems**.

Faster and more reliable installation.

On site, the hub is simply **lifted into place and connected to mains services**. The complexity has already been absorbed upstream in the factory, which means fewer trades need to work in the same area. That reduces scheduling clashes, avoids rework, and **accelerates the overall construction timeline**.

Electrical connections are pre-coordinated inside the hub, reducing on-site cable-pulling and further speeding up installation.

Electrical systems are delivered as pre-coordinated, plug-and-play interfaces, removing on-site electrical improvisation and further reducing dependence on scarce skilled labour.

Predictable quality.

Because every hub is built under the same controlled process, **performance is standardized** across the project. Factory tolerances are verified and repeatable, ensuring consistent flows, pressures, and moisture protection across all apartments - something impossible to guarantee in site-built installations. One apartment's hub is functionally identical to the next, which simplifies commissioning, inspections, and later servicing. Instead of an unpredictable patchwork of site-built solutions, the building has a series of **identical, high-quality units**.

In practice, this means **less risk for developers**, **fewer delays for contractors**, and far fewer hidden liabilities for owners. For tenants, it means their most critical utilities - hot water, ventilation, and safety systems - are housed in a unit that has already been **tested and certified** before they move in.

By turning the bathroom into a protected, factory-built installation hub, Ekonod takes one of the construction industry's most troublesome areas and converts it into a strength: **standardized, moisture-safe, quick to install, and reliable over decades**.

6B: AI-ready and digitally connected

In the past, a building's technical systems were designed as closed boxes. Heating, ventilation, and plumbing worked in isolation, and once installed, they rarely communicated with each other - let alone with external systems like the electricity grid or tenant apps. That model might have worked when energy was cheap and buildings were static assets, but today the market demands more. Buildings must be smart, adaptable, and digitally connected if they are to hold value over decades.

This is where Ekonod's hubs create a major step-change. Each hub is built to be AI-ready from day one. This includes pre-integrated electrical distribution and metering, designed for direct connection rather than manual on-site wiring. Instead of locking projects into proprietary systems or outdated protocols, Ekonod uses open, widely adopted digital standards that ensure long-term compatibility:

Matter

the new universal smart-home standard backed by Apple, Google, Amazon, and other industry giants. Matter allows devices and systems from different manufacturers to "speak the same language," making integration far simpler. With Matter compatibility, an Ekonod hub can connect directly to future smart-home ecosystems, ensuring tenant-level services like energy dashboards or leak alerts are easy to deploy.

Modbus

the established global backbone for industrial and building automation. With Modbus integration, Ekonod hubs can slot directly into existing building management systems (BMS), district energy platforms, or third-party monitoring services without costly custom development.

By combining these two standards, Ekonod is not only future-proof but also vendor-agnostic. During commissioning, these open protocols allow apartment-level verification and automated diagnostics, removing much of the manual balancing, fault tracing, and building-wide troubleshooting required in centralized systems. Developers and owners are not locked into one software ecosystem or hardware supplier. Instead, the hubs can connect seamlessly with whatever platform is most relevant - whether that's an existing BMS, a municipal smart-grid pilot, or a tenant-facing energy app.

Practical benefits of digital readiness

For owners and developers

the building remains competitive over time. As new energy services emerge (e.g., demand-response programs, dynamic tariffs, predictive maintenance), Ekonod hubs can integrate without requiring disruptive retrofits. This protects the asset's long-term value.

For facility managers

maintenance becomes data-driven. With integrated sensors and open protocols, faults can be detected early, performance can be optimized remotely, and site visits can be minimized.

For tenants

transparency and control. Instead of a single bulk energy bill, tenants can see their own consumption, adjust their settings, and even benefit from services like energy sharing or time-of-use pricing. This creates a direct link between behaviour and savings, encouraging sustainable living without sacrificing comfort.

Why this matters

The building sector is under pressure from two directions: on one hand, rising regulatory demands for energy reporting, ESG alignment, and digital transparency; on the other hand, tenant expectations for smarter, more personalized homes. A system that cannot adapt digitally risks becoming obsolete within a decade.

Ekonod hubs solve this by embedding digital readiness at the core. They are not "dumb pipes" waiting for retrofitted sensors - they are intelligent, connected systems that make the building ready for both today's demands and tomorrow's opportunities.

Ekonod hubs are built as digital natives:

With Matter and Modbus compatibility, they connect easily to both consumer smart-home platforms and professional building management systems. For owners, this means future-proof investments. For operators, it means better data and lower service costs. And for tenants, it means smarter, safer, and more transparent living.

6C: Built-in intelligence: sensors and safeguards

In traditional building projects, safety systems are often added at the very end of construction. A plumber might place a leak detector under a sink, or an electrician might install a smoke alarm on the ceiling. These devices are typically standalone, piecemeal, and uncoordinated. They vary in quality, they may or may not be properly maintained, and they often don't "talk" to the rest of the building's systems.

The result is a patchwork of protection that leaves both tenants and owners exposed. A single missed sensor, a drained battery, or a slow response can escalate into a costly insurance claim or a disruptive building-wide issue.

Ekonod takes a radically different approach. Instead of treating safety as an afterthought, it integrates intelligence directly into the hub itself. Because every hub is factory-built and tested, the same set of safeguards can be standardized across every apartment, ensuring consistent, reliable coverage.

What's built in

Leak detection

sensors placed at critical points monitor for even the smallest water presence, detecting problems before they become floods.

Automatic shut-off valves

if a leak is detected, the system can immediately cut off water supply to that apartment. This prevents localized problems from spreading and eliminates the need for tenants to act manually.

Moisture monitoring

hidden moisture is one of the biggest long-term risks for building owners, often leading to mold, structural damage, and health complaints. Integrated sensors catch these issues early, long before they would be visible.

Fire detection

hubs can be configured with fire sensors, adding an extra layer of protection where critical utilities meet.

Because these features are factory-installed, tested, and standardized, there's no variability from apartment to apartment. Every tenant gets the same level of protection, and every owner knows exactly what safeguards are in place.

Why this matters

For tenants

peace of mind. They know that leaks or failures won't spiral out of control while they're away on holiday, and that their apartment is protected by sensors built into the infrastructure, not just gadgets scattered around.

For owners

risk reduction. Water damage is one of the most frequent and expensive categories of insurance claims in Sweden and across Europe. By standardizing leak detection and shut-off at the source, Ekonod reduces both the likelihood and the scale of such claims. This has the potential to lower premiums, improve insurability, and protect asset value.

For facility managers

better control. Integrated sensors can feed directly into digital dashboards (via Modbus, Matter, or AI platforms), allowing issues to be monitored remotely and addressed quickly. Instead of being called after damage has occurred, facility teams can intervene proactively.

The bigger picture

> Centralized systems create centralized risk. If something fails in a riser, the entire building may be affected before anyone notices. Ekonod flips this model: risks are broken down to the apartment level, and each hub is both the utility engine and the safety monitor for that unit.
>
> This isn't just a technical advantage - it changes the entire risk profile of a building. Failures are contained, damages are prevented, and responsibility is clearer. The system isn't just efficient, it is resilient.

Ekonod hubs don't just deliver heating, ventilation, and water - they actively protect the building. With leak detection, shut-off, moisture monitoring, and fire safety built in at the factory, every apartment comes with standardized safeguards that reduce risk, cut insurance costs, and keep tenants safe.

6D: Material flexibility: timber, concrete, steel

A common worry when introducing new building technologies is: “Does it only work in one type of project?” Developers and architects know that construction methods vary widely. In Sweden alone, there are timber-based projects (CLT or KL-trä, cross-laminated timber), traditional concrete blocks, and increasingly steel-frame buildings. Each comes with its own demands: fire safety, acoustic performance, penetrations, ceiling heights, and cost dynamics. A system that only works in one material type is destined to remain a niche. This is where Ekonod stands apart. Because the hubs are compact, self-contained installation centres, they do not depend on long riser shafts or sprawling plant rooms. They localize distribution to the apartment, reducing penetrations and horizontal runs. That makes them material-agnostic - able to fit into timber, concrete, or steel without needing fundamental redesign.

Timber projects (CLT / KL-trä)

Timber Construction

Timber has surged in popularity thanks to its low embodied carbon, speed of assembly, and aesthetic appeal. But it brings unique technical challenges: every penetration through a timber slab must be carefully sealed to maintain fire separation and acoustic performance. Traditional centralized MEP systems demand many such penetrations for long vertical risers and horizontal runs. With Ekonod, penetrations are drastically reduced. Each apartment’s hub connects locally, so fewer shafts are needed, and services do not snake across floors. This means:

- Less expensive fire-stopping.
- Stronger acoustic performance (no flanking noise through ducts/pipes).
- Faster compliance in permitting and inspection.

For architects, this also means more freedom to design open-plan timber layouts without being dictated by service shafts.

Concrete projects

Concrete Construction

Concrete remains the dominant material in Swedish multifamily construction. But service shafts and risers can eat up valuable floor area, often several square meters per floor. Because Ekonod hubs require much smaller risers and can be installed into thinner wall constructions, architects can reclaim both floor area and wall thickness across every floor plate. Over an entire project, this can mean tens of apartments’ worth of lost sellable space. Ekonod hubs shrink these shafts dramatically - in some projects, eliminating them altogether. Bathrooms and kitchens can be placed where they make the most sense for layout and flow, instead of clustering awkwardly just to be near risers. For developers, every square meter reclaimed translates into higher revenue. For tenants, the benefit is apartments that feel bigger, brighter, and better proportioned.

Steel-frame projects

Steel-Frame Construction

Steel structures are increasingly used in hybrid projects, mixed-use buildings, or modular high-rises. But long horizontal service runs are notoriously tricky in steel projects, often requiring bulkheads, suspended ceilings, or secondary frameworks. These add both cost and complexity. Ekonod removes much of this pain. Because hubs are localized at the apartment level, they require only short connections to mains. This avoids large-scale service coordination with structural spans, reduces the need for bulkheads, and speeds up installation.

Practical impacts

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For architects	**For developers**	**For contractors**
greater freedom to focus on design priorities such as natural light, circulation, and livability, without being forced to align layouts around service cores.	higher net lettable/sellable area, which can mean millions in extra project value.	easier detailing, since there are fewer penetrations to seal, fewer trades colliding, and less need for redesign mid-project.

Ekonod essentially decouples MEP from the building’s structural material. This is rare in construction. Most systems are tied tightly to the skeleton of the building; Ekonod instead acts as a modular overlay that can be applied across timber, concrete, and steel. For developers with large, mixed portfolios, this means they can standardize on one installation approach while varying structure to suit site conditions or sustainability goals. For municipalities and housing associations, it means projects don’t need a different design process every time the construction method changes.

Ekonod is material-flexible.

It integrates seamlessly with timber, concrete, or steel, freeing architects from shaft-driven design and giving developers more usable floor area. By removing penetrations and central shafts, it not only simplifies construction but also adds direct commercial value to projects. This universality is what positions Ekonod as a true European standard, not just a niche innovation.

6E: Integration: decentralized first, but hybrid-capable

At its core, Ekonod is designed for full decentralization. That is the model where every apartment has its own compact hub, handling hot water, ventilation, energy distribution, including electrical distribution and control, at the unit level. In this setup, the traditional long distribution pipes, circulation loops, balancing valves, and oversized pumps disappear. Energy losses are cut, failures are contained to single apartments, and both cost and carbon footprints shrink dramatically.

However, construction reality is rarely as clean-cut as theory. Many projects - especially retrofits or mixed-use developments - cannot go “all in” on decentralization from day one. A housing cooperative renovating an older building may need to keep part of its central heating plant. A municipality may face regulations that still assume a centralized topology. Or a developer may simply want to phase in decentralization over multiple projects rather than commit everything at once.

Most traditional systems don’t allow this kind of flexibility. They are either centralized or not - which forces developers into an all-or-nothing gamble. That rigidity creates hesitation: why take the leap if your current project has constraints?

Ekonod solves this with a hybrid-capable architecture. The hubs are designed to operate in a fully decentralized model, but they can just as easily connect into centralized elements when required. This means the system adapts to the project, rather than forcing the project to adapt to the system.

How hybrid integration works in practice

New-build project

In a new-build project, where the developer controls the full design, Ekonod can be deployed in its pure form: each apartment with its hub, no VVC loops, no oversized plant rooms. This is the optimal case for cost and energy performance.

Retrofit project

In a retrofit project, Ekonod hubs can still be placed in each apartment, but instead of generating heat or ventilation independently, they can feed from an existing central plant. The building still gains the benefits of localized risk, leak detection, and tenant-level metering, even if the heat source remains centralized.

Mixed project

In a mixed project (for example, a block with both apartments and shared spaces), some services can remain centralized while residential units benefit from localized hubs. This hybrid model ensures the project gains Ekonod’s resilience and efficiency where it matters most, without needing to redesign everything.

Why this flexibility matters

For developers

it removes a key barrier to adoption. They don’t have to wait until the “perfect project” comes along to start using Ekonod. Even if only part of a project is suitable for decentralization, the hubs can still deliver measurable benefits.

For owners

it future-proofs their investment. A building designed today in hybrid form can later be converted further toward decentralization as regulations, technologies, or economics evolve. No sunk cost, no wasted investment.

For architects and engineers

it unlocks greater design freedom. They can integrate hubs flexibly depending on structure, layout, or zoning, without worrying that the entire building must conform to one rigid system logic.

Energy, regulation, and technology are not static - they change every decade. A building designed today may face entirely different operational requirements in 20 years. Systems that are rigidly centralized lock owners into high OPEX, high energy losses, and inflexible retrofits.

By contrast, Ekonod’s hybrid-capable design gives projects a pathway forward. Even if the first step is partial, the system sets up the building for deeper efficiency later. It makes decentralization an incremental journey, not a cliff-edge decision.

> Ekonod is decentralized by design - but hybrid-capable by necessity. This flexibility ensures that projects can adopt the system under a variety of conditions, gain immediate benefits, and still remain open to deeper efficiency in the future. It’s not an “all-or-nothing” risk. It’s a configurable, future-proof platform that meets projects where they are and helps them move toward the European standard of decentralized, resilient building services.