

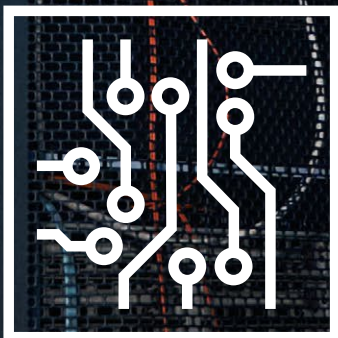
Data centres in Europe

Building the shell that keeps data safe



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Driven by artificial intelligence, cloud and sovereignty concerns, data centres are emerging as a new building typology across Europe. Behind the digital performance lies the building performance: fire safety, thermal and acoustic control, durability.

On all these fronts, ROCKWOOL Core Solutions brings a value-chain-wide perspective and shows, in practical terms, how stone wool helps deliver a safe, durable envelope.

The data centre: a new object in the built environment

The rise of data centres is transforming urban and peri-urban landscapes. Before discussing materials, it helps to set out the fundamentals: what are we talking about, and who decides?

What is a data centre?

A building whose primary mission is to ensure the continuous operation of critical IT infrastructure. Depending on their use (high-performance computing or HPC, cloud, AI training, inference), these infrastructures share neither the same architecture nor the same availability requirements: a cloud site aims for near-absolute service continuity, whereas an AI training cluster tolerates more scheduled interruptions but imposes far higher power densities.

The issue can be summed up in a single word: the availability of the infrastructure, the guarantee that digital services never always stop and remain fully

performant, in whatever conditions. Operators target the highest possible service level, at most a few minutes of downtime per year. Sizes and capacities vary widely, but one trend dominates: density is exploding. Loads tied to artificial intelligence and high-performance computing now push power to 100-200 kW per server rack, compared with around 20 kW for a traditional environment. This concentration is a game changer for the building: more heat to dissipate, more intense electrical loads and higher temperatures, hence sharply increased requirements for cooling, fire safety and envelope performance.

Differences by size

- Hyperscale data centres seek very high-power levels (over 100 MW, often between 400 MW and 1 GW today), which complicates their grid connection and their acceptability.
- Intermediate data centres, being less demanding, can be in more constrained environments and offer greater flexibility in their energy mix.



Data centre typology

Mid-sized data centre vs hyperscale

Mid-sized data centres Proximity -edge - regional		Hyperscale AI & Cloud mega-sites
Industrial, IoT, SMEs, mid-caps, public authorities	Clients	Big Tech, cloud, AI, large groups
1.000-20.000 m²	Floor area	50.000-200.000 m²
0,5-10 MW	Power	100 MW – 1 GW
€ 50-150 M	Investment	€ 100M-4bn
10-50	Direct jobs	≥100
100-200	Indirect jobs construction	500-2.000+ On projects > € 100M
1,8-3	PUE Power Usage Effectiveness	1,2-1,5 Lower = more efficient

* Total project investment

Growing demand for these strategic infrastructures

Compute demand is soaring, and in just a few years Europe is building a stock equivalent to several decades of infrastructure. Growth is now running up against access to energy and land, which is reshaping the map of where facilities are located.

Markets are not all at the same stage of maturity. Germany (more than 500 data centres, around 2.7 GW, driven by Frankfurt and the DE-CIX hub) and the United Kingdom (more than 500 sites, with London still Europe's leading market at around 1.2 GW in service) dominate. France ranks third (more than 320 data centres; Paris and Marseille together totaling around 950 MW), with Paris having overtaken Amsterdam in 2024. Saturated in terms of both energy and land, these hubs are ceding ground to emerging markets, Spain, Italy, Portugal and the Nordic countries, which are capturing a growing share of new projects.

In France, the market already numbers more than 300 commercial data centres: installed capacity rose from 566 MW in 2022 to more than 700 MW at the end of 2025 (+40% in a single year) and is expected

to exceed 1 GW as early as the end of 2026, driven by more than €100 billion of announced investment.

Globally, data centres today consume around 415 TWh per year, close to 1.5% of the world's electricity; this demand could almost double by 2030 (around 945 TWh, or +15% per year, four times faster than other sectors). McKinsey estimates that AI workloads could account for nearly 70% of it by the end of the decade.

Europe is seeing the same momentum: data centre electricity consumption is expected to rise from around 96 TWh in 2024 to 236 TWh in 2035 (from 3.1% to 5.7% of demand).

The five historic markets, Frankfurt, London, Amsterdam, Paris and Dublin, grouped under the acronym "FLAP-D", have more than doubled their capacity in six years (from 1.8 GW in 2019 to 3.6 GW in 2025) and, together with Milan, concentrate more than 45% of European operational capacity, now above 11 GW (+19% per year). Beyond the watts, this consumption trajectory is the clearest indicator of market growth: it reflects a stock that is densifying and expanding at a sustained pace and makes access to energy the main structuring factor for future locations.

Data centres, Europe accelerates

The data centre market in figures

~945 TWh

Global consumption in 2030

vs ~415 TWh today + 15%/yr (x 2.3)

~50%

Of global capacity captured by AI by 2030

Source: McKinsey

3.6 GW

Europe - FLAP D hub (2025)

X2 since 2018 > 45% EMEA

> 1 GW

France – target by end 2026

+300 sites > € 100 bn

x 5-10

AI/HPC density per rack

100-200 kW vs ~20 kW

Key takeaway: a market doubling roughly every 6 years, driven by AI: the challenge shifts to the envelope (fire, thermal, acoustic).

Three challenges to address collectively

Studying the entire value chain (manufacturers, developers, engineering firms, energy companies, architects) brings out three challenges to be addressed collectively and one structuring dividing line between hyperscale data centres and intermediate-sized ones.

1. Territorial challenge: acceptability, conditionality and access to land

Data centres are being built in a tense territorial context, where elected officials and citizens scrutinize their land and environmental footprint. Compatible land (grid connection, logistics, discretion) is becoming harder to find, and both local authorities and the State increasingly make authorization conditional on tangible local benefits: heat recovery, urban integration, local jobs, land-use restraint (France's Net Zero Land Take, ZAN). Intermediate projects, better embedded in a logic of co-benefits, are often more readily accepted than the very large hyperscalers. Water has also become a critical concern, as data centers are major consumers in a world facing increasing drought and resource scarcity; sustainable water management and reuse are now key expectations for new facilities.

2. Construction challenge: design, materials, modularity and commissioning

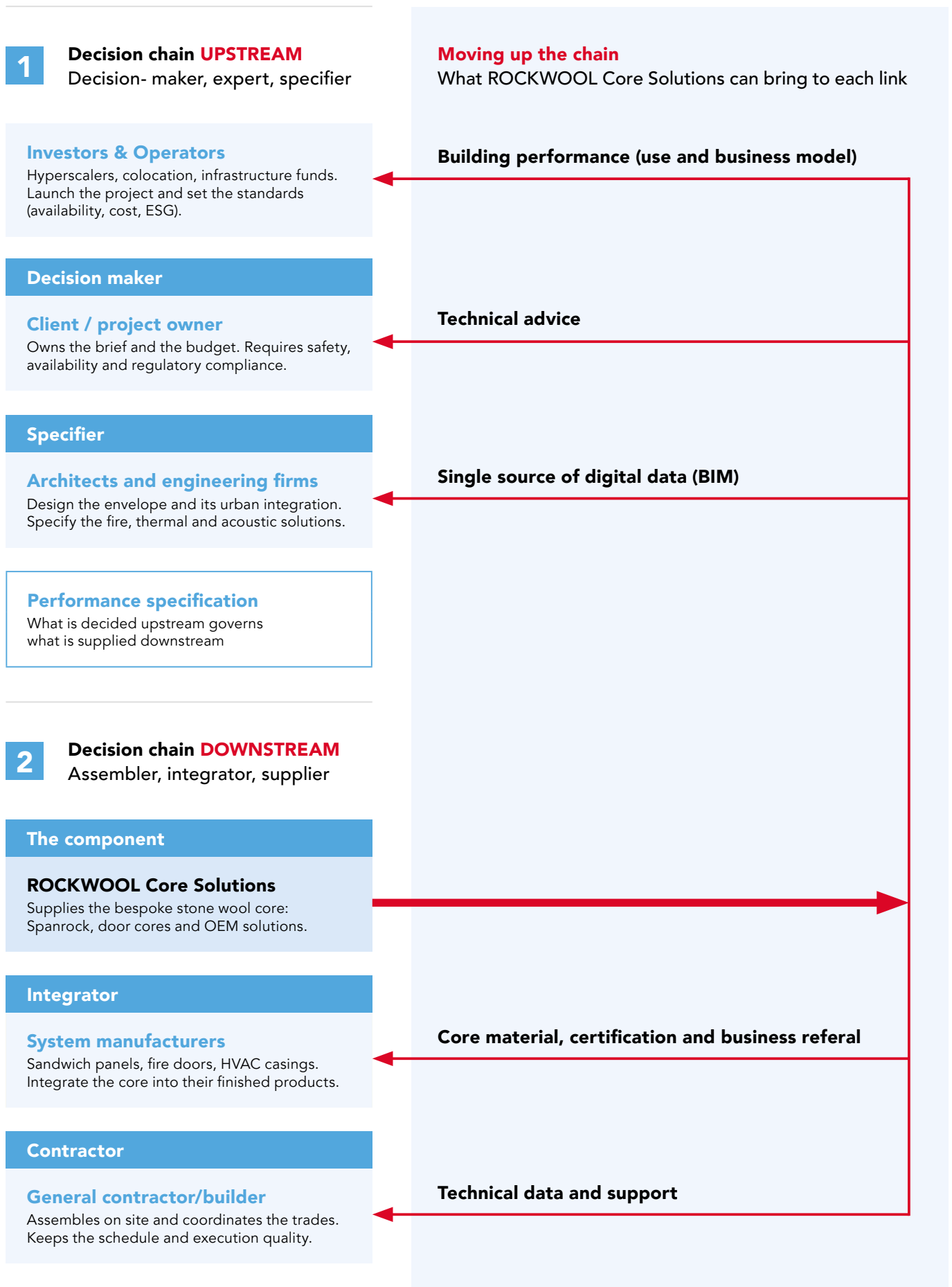
The technical complexity of projects is increasing by nearly 70% of construction cost is now tied to technical packages, and commissioning is becoming a differentiating factor. Hyperscalers impose standardized designs on a global scale, leaving little room for local innovation, whereas intermediate data centres open up space for co-design (heat recovery, integration into the building). Modularity is becoming decisive: rack size and density change over one to two years (sometimes six months), so the building must be able to accommodate successive generations of equipment without major structural work. Innovation in equipment thus directly shapes the design of the building, which must be conceived as adaptable from the outset.

3. Energy challenge: securing supply, autonomy and hybridization

Access to energy is the main bottleneck: many projects are stalled for lack of available grid connection capacity, which makes time-to-market a critical issue, particularly for artificial intelligence. In addition, putting waste heat to use is emerging as a lever for both efficiency and acceptability. Here too, hyperscale data centres (over 100 MW) concentrate the connection difficulties, whereas intermediate sites offer more flexibility in their energy mix.

Value chain & decision chain

Who decides, who delivers, and where ROCKWOOL Core Solutions fits



Understanding the building challenges of a data centre

A data centre is no longer “a large server room”: it is a complex infrastructure whose envelope, façade, roof, internal walls and plenums, plays a measurable role in reliability, efficiency and safety.

What is a desirable data centre?

A desirable data centre is not content merely to be high-performing and available: it is an infrastructure that its territory accepts and values. It combines five qualities: careful architectural and landscape integration, well-controlled fire safety, energy efficiency coupled with the recovery of waste heat, local co-benefits (jobs, district heating networks) and a durable envelope designed for longevity and reuse. It is on these conditions that it earns its social license to operate, and therefore its permits.

Five constraints shape the design:

Fire safety: the most critical risk; a single incident can shut down the site.

The concentration of electrical equipment and high temperatures creates an ignition risk. For major operators and residents alike, “it doesn’t burn” is becoming an argument of reputation as much as of safety. The stakes are high: although rare, such fires are nonetheless potentially catastrophic. The OVHcloud fire in Strasbourg (2021) cost the operator more than €105 million, less than half of it covered by insurance, and every hour of downtime runs into hundreds of thousands of euros.

Thermal performance: less wasted energy, lower costs and emissions.

Maintaining stable conditions while limiting losses and overheating is both an economic and a regulatory imperative: the European directive on the energy performance of buildings (EPBD) imposes the “zero-emission” standard on new non-residential buildings by 2030.

Acoustic performance: noise determines a project’s acceptability.

Technical equipment (ventilation, heat exchangers) is noisy and often located in inhabited areas. Controlling noise determines both a project’s acceptability and the comfort of operators. As data centres are increasingly being located in urban environments, compliance with acoustic regulations is becoming a decisive factor for project acceptability. Technical equipment such as ventilation systems and heat exchangers can generate significant noise, impacting both operators’ working conditions and the local community.

At the European level, noise control for installations such as data centres is subject to **Directive 2002/49/EC** of the European Parliament and of the Council on the assessment and management of environmental noise (“Environmental Noise Directive”). This directive requires Member States to map and manage environmental noise, particularly in urban areas, and sets a framework for local authorities to impose limits. Many countries and cities, in line with the directive, have adopted maximum allowable noise thresholds at property lines and in sensitive areas (such as residential zones).

Durability: a building fabric that must stand the test of time

The building sector accounts for nearly 37% of global carbon emissions, and construction and demolition for up to 40% of solid waste. Airtightness (EN 12114) and the longevity of materials are becoming decisive selection criteria. Durability also encompasses adaptability: because equipment (racks, cooling) is renewed rapidly, a building able to adapt to changing configurations without being rebuilt retains its use value as surely as the robustness of its materials.

Aesthetics: good integration secures the building permit.

Long reduced to a technical box, the data centre is now built in inhabited areas, where its landscape integration is becoming an acceptability factor in its own right. A massive volume with no façade treatment crystallizes opposition from residents

and local authorities and poses a real risk to timelines and to obtaining permits. Careful envelope design (quantities, materials) is therefore not an option: it is a condition for accessing land and for the social license to operate. Nonetheless, it remains secondary to land, energy, noise and fire safety: its weight is mainly indirect, by conditioning local acceptability and therefore the granting and timing

of permits. For the envelope, the most effective response remains facade sandwich panels, which combine architectural treatment, fire performance and thermal performance in a single product.

The promise: build a durable envelope to protect the data inside.

Case study: The other “firewall” of an Equinix data centre

As the flagship data centre on Equinix’s London Slough campus, LD6 International Business Exchange™ (IBX) is one of the world’s largest internet exchanges, and a critical node in global connectivity. The facility must operate around the clock with minimal unplanned downtime, placing strict demands on every part of the building, including the envelope.

Fire safety at the core of data centres

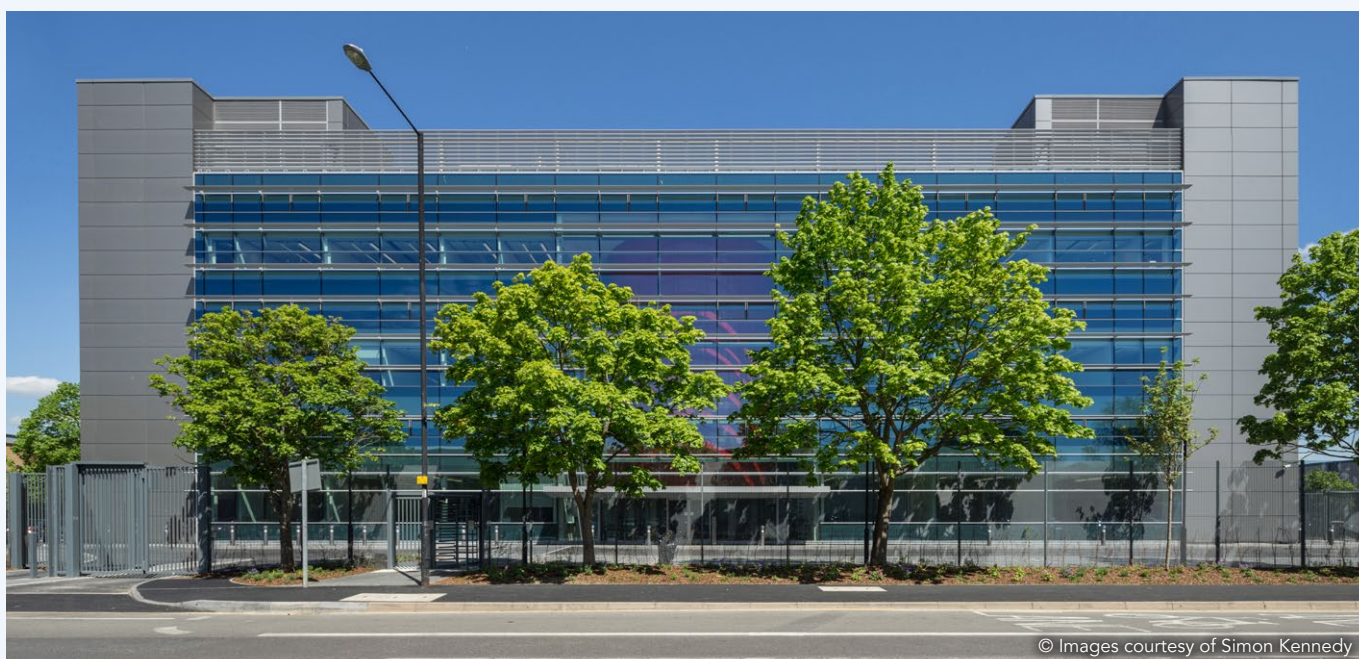
Before its construction in 2015, LD6 was envisioned as a facility that could deliver high levels of resilience and efficiency within a busy, multi-building campus, without disruption. It needed an envelope that would:

- Provide a high degree of fire safety to support unmanned 24/7 operation
- Maintain stable internal conditions for sensitive IT equipment
- Offer strong physical security with a largely opaque façade

- Be delivered quickly alongside existing live buildings
- Align with the campus’ clean, professional identity

These required a solution that could combine high fire resilience, strong thermal and acoustic performance, and modular and scalable construction, packaged up in a refined visual expression. That is where a sandwich panel façade system with stone wool cores could take centre stage.

At a hub like LD6, any fire could threaten critical infrastructure, disrupt customer services and impact neighboring facilities on the same campus, risking millions in lost revenue. To mitigate this, the project team treated the building fabric as an integral part of the fire safety and risk management strategy.



© Images courtesy of Simon Kennedy

Ensuring fire safety compliance with stone wool insulated sandwich panels

To ensure non-combustibility, the 10,803 m² building used steel sandwich panels for its envelope, containing cores of 120 mm thick stone wool. With a melting point above 1,000°C, stone wool helps to contain fire and limit flame spread within the building envelope. In tested sandwich panel systems, this supports fire classification ratings up to A2-s1, d0 under the EN 13501-1 Euroclass standard. In practice, this enables the panels to act as a fire barrier, buying valuable time for evacuation and emergency response.

Because stone wool is dimensionally stable and resistant to high temperatures, its insulating and fire resisting characteristics remain reliable throughout the building's lifetime. The key was to use materials that provide fire resistance without compromising physical security, flexibility, control of cost and project timescales.

Reducing energy consumption with stone wool

As lifetime electricity cost is the main OPEX of a data centre, LD6 also needed to use as little energy as possible. For this purpose, the stone wool cores in the panels provide strong thermal insulation. This reduces heat transfer through the façade and maintains tight temperature bands inside the data halls. This, in turn, lowers the cooling load — fans do not need to consume as much energy to keep servers within optimal operating ranges.

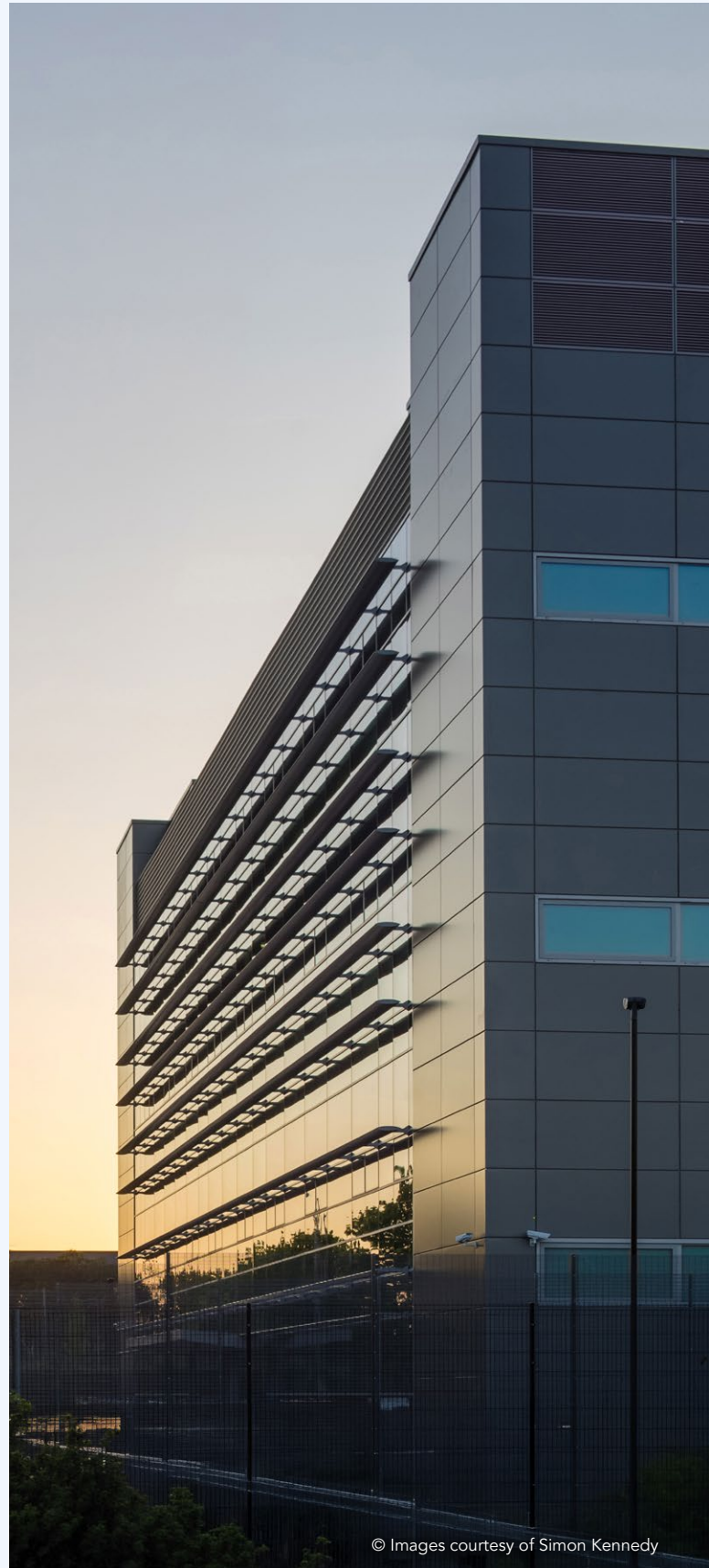
In this way, the envelope is not just a passive enclosure, but an integral part of the building's technical systems. This performance was one of the contributors to LD6 achieving LEED Gold accreditation, reflecting the building's overall sustainability credentials.



Upload the brochure at:

Case studies | Equinix Data Centre
ROCKWOOL Core Solutions

Positioning: ROCKWOOL stone wool meets the building's critical requirements simultaneously, fire, thermal, acoustic and durability, in a single non-combustible material.

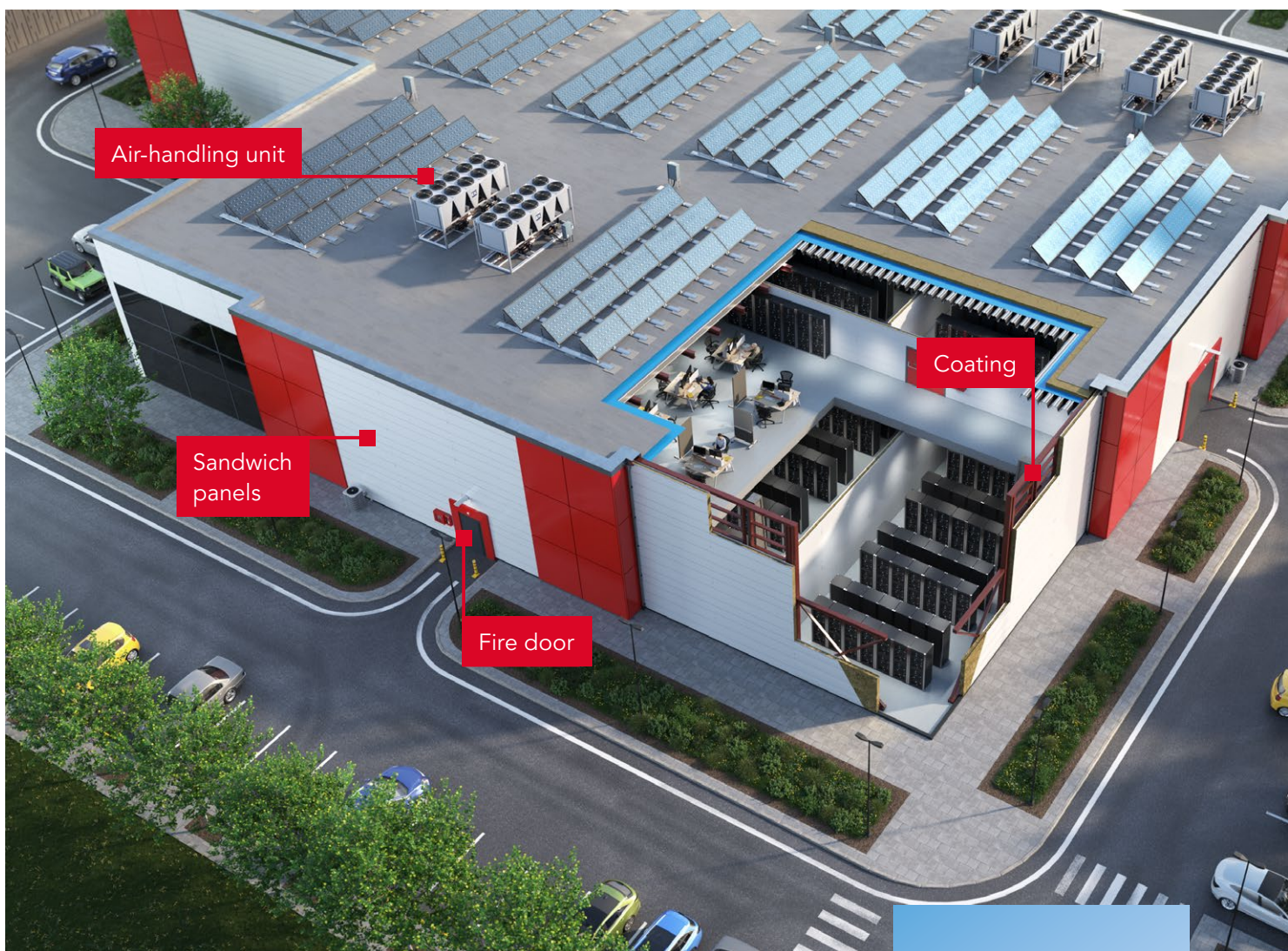


© Images courtesy of Simon Kennedy

Stone wool solutions: an asset for data centres

ROCKWOOL stone wool is far more than insulation. A mineral material made from volcanic rock, non-combustible (Euroclass A1), it combines four complementary strengths: fire performance, thermal insulation, acoustic comfort and durability.

ROCKWOOL Core Solutions supplies bespoke stone wool cores, integrated by partner manufacturers into panels, doors and equipment, following a co-development approach.



Building envelope & compartmentation

Thanks to their non-combustible Spanrock® stone wool core, sandwich panels contribute neither to the spread of fire nor to significant production of smoke. Used for façades, compartmentation walls and ceilings, they create secure spaces and maintain the controlled environments essential to the proper functioning of data centres.



More information at:

<https://coresolutions.rockwool.com/en/solutions-and-applications/stone-wool-for-sandwich-panels/>



Fire protection

Lapinus® CF and Lapinus® MS fibers, incorporated into intumescent coatings, strengthen passive fire protection by delaying the heating of steel structures. They provide additional time for occupants to evacuate and for emergency services to intervene before any loss of structural resistance.



More information at:

<https://coresolutions.rockwool.com/en/solutions-and-applications/mineral-fibres-for-industrial-composites/coatings/>



Combined with a stone wool core, fire doors meet regulatory compartmentation requirements and limit the impact of an incident on operational continuity.



More information at:

<https://coresolutions.rockwool.com/en/solutions-and-applications/stone-wool-for-industrial-manufacturers/fire-doors-insulation/>



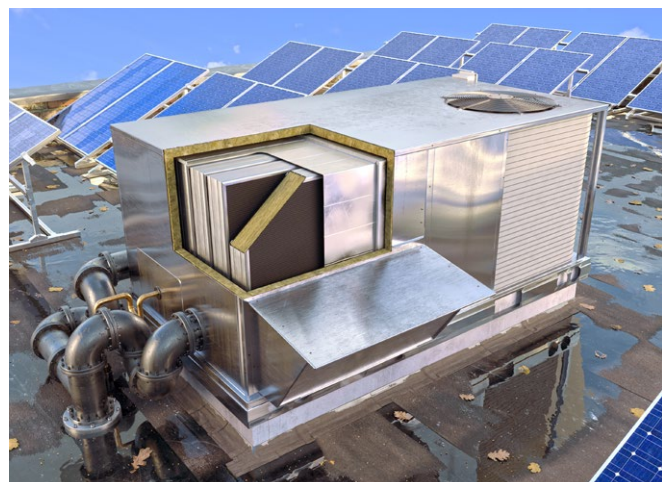
Air-handling systems

Used in silencers, acoustic enclosures and air-handling ductwork, Silkrock® insulation panels effectively reduce the noise generated by technical equipment while ensuring a safe, high performing operating environment that meets data center requirements.



More information at:

<https://coresolutions.rockwool.com/en/solutions-and-applications/stone-wool-for-industrial-manufacturers/air-handling-unit-systems-insulation/>



Durability and responsible construction

Made from volcanic rock, stone wool is a naturally durable, robust and recyclable material. Its longevity allows it to accompany buildings designed to evolve over time while limiting their environmental impact.

To back up these performance claims with hard data, ROCKWOOL Core Solutions provides Environmental Product Declarations (EPDs) based on life cycle assessments of its solutions. Spanrock® stone wool cores also hold Cradle to Cradle® Material Health Bronze certification, which attests to the health quality of the materials, their traceability and their reuse potential.



These elements facilitate the integration of the solutions into the main green building rating systems (LEED®, BREEAM®, DGNB or HQE) and meet the growing expectations of project owners in terms of environmental performance.

Impact on data centre performance:

Beyond its insulating function, stone wool contributes directly to the overall performance of the data centre:

- Improved fire safety and greater resilience of critical infrastructure
- Optimized thermal performance of the envelope, helping to control energy consumption
- Reduced acoustic nuisance to support project acceptability
- Extended building lifespan thanks to a robust and durable material
- Contribution to decarbonization targets and to the environmental certifications of buildings.

The building envelope becomes a genuine level of technical, economic and environmental performance, serving the availability of digital infrastructure.



Conclusion & call to action

The data centre market is structuring itself at high speed: making early positioning essential. By providing a cross-cutting reading of the challenges and showing, point by point, where stone wool adds value, ROCKWOOL Core Solutions establishes itself as a credible and proactive partner for architects, contractors and clients.

In their words:

"The data centre is probably the only type of infrastructure where the building accounts for just 10 to 15% of the asset's overall budget. For operators, the priority remains performance, together with a carefully designed architectural object, well integrated and locally accepted.", Emma North, Data Centre Expert, Impulse Partners

"Looking at the whole picture, insulation is not a major budget item; nonetheless the sandwich panel system proves very attractive in terms of time savings. Thermal and acoustic performance are levers of interest for smaller data centres close to cities.", Maxime Chamillard, Innovation Director, APL



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ROCKWOOL Group is the world leader in stone wool products, from building insulation to acoustic ceilings, external cladding systems to horticultural solutions, engineered fibres for industrial use to insulation for the process industry and marine & offshore. We are committed to enriching the lives of everyone who experiences our products and services, and to helping customers and communities tackle many of today's biggest sustainability and development challenges including energy consumption, noise pollution, fire resilience, water scarcity, urban flooding and more.

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