deepki

Sustainable Real Estate: the road to net zero

By Vincent Bryant, CEO & Co-founder of Deepki

The reality of climate change is no longer up for debate, as any quick internet search will confirm. From historically high temperatures in Antarctica, to coral bleaching on the Great Barrier Reef, and unprecedented droughts worldwide, extreme weather events are daily reminders of our planet's precarity. In its **latest report, the IPCC** urges immediate action to prevent greenhouse gas emissions from peaking past 2025 and limit global warming to 1.5°C. "Without immediate and deep emissions reductions across all sectors, it will be impossible."

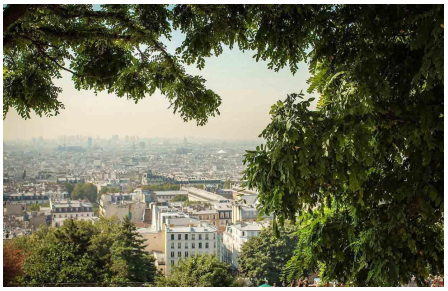
Geopolitical turmoil has made the fight against global warming and energy dependence a double imperative. Countries in control of key natural resources have a disproportionate upper hand in world power dynamics, and today's crisis in Ukraine throws into sharp relief the perils of this imbalance. Lowering energy consumption isn't just vital to curb climate change, but also to guard against bullying from dictatorial regimes.

Perhaps even closer to home, the Covid pandemic has highlighted issues that go beyond global health, like complex cause-and-effect cycles (supply chain issues, shortages, etc.) just as a slew of new environmental regulations are hammering home the need for action.

Faced with this alarming reality, we all have our share of responsibility: governments, businesses, local authorities, the media and individuals. Every sector of the economy (transportation, industry, agriculture, etc.) contributes to the **55 gigatons of carbon emitted annually worldwide**. Among these sectors, real estate is the number one emitter of greenhouse gasses, accounting for 37% of global emissions.

It's time to act, and act quickly.

Scoping out greenhouse gas



Buildings generate greenhouse gas emissions, both through their construction (known as Scope 3 emissions) and their use (Scopes 1 and 2). The materials used in construction (concrete, steel, glass) are manufactured, transformed and transported – all processes that emit large quantities of greenhouse gasses. Once standing, buildings generate hefty direct emissions (scope 1) from their use of fossil fuels (natural gas, oil, etc.,) and refrigerants for cooling, but also indirect emissions (scope 2) due to electricity (lighting, computers, elevators, etc.) and district heating/cooling use, as well as their use of services and materials (representing scope 3).

A common accounting framework is essential if we are to avoid confusion when assessing and benchmarking buildings' performance. Car manufacturers would have us believe that they are offering zero-emission vehicles by only addressing Scope 1; the same applies to buildings. The fact is, zero-emission buildings simply do not exist. All buildings emit greenhouse gasses, both directly and indirectly. Regulators have not yet agreed upon a clear methodology, and so it is key that Real Estate players work together, following a philosophy of common standards in order to avoid greenwashing and groundless KPIs.

Given the growing number of new buildings worldwide, today only one third of the sector's emissions come from direct building sources – **in the form of energy consumption and A/C refrigerants**. In Western countries like France, where most of the building stock already exists, the relative share of emissions linked to construction is much lower (barely 15% of the sector's emissions), with **most emissions stemming from Scopes 1 and 2**.

Interestingly, 80% of 2050's property assets are already standing. In other words, while minimizing construction-related emissions is essential, the renovation and retrofitting of existing real estate ought to be the top priority. Compliance with the Paris Agreement boils down to two key efforts: reducing emissions from new construction (and retrofitting) while whittling direct building emissions down to net zero (or near-zero) by 2050.

Net zero in 3 steps

Spoiler alert: almost all human activities emit CO_2. So the theoretical goal of any building, actor or industry reaching zero emissions by 2050 is practically impossible. Nevertheless, there is a way to get there:

- Step one: let data do the talking
- Step two: gathering insights for good decisions
- Step three: moving forward, now

How should we start? What are the best practices to adopt? The pitfalls to avoid? How can we build such a trajectory? Who will do it first? How much will all of this cost? What are the requirements? How will we know it's working? What will be the return on investment? By the latest estimates, taking today's real estate to net zero will require an investment of five trillion dollars each year[1]. In other words, roughly half the size of **today's global Assets Under Management** – a mammoth, long-haul effort.

Dollars and sense: a new paradigm

Since the Asian financial crisis in the late 90's, the real estate sector has seen profound change with the "financialization" of its activities. Once upon a time, investment decisions were based on a mix of common sense, intuition, property appeal and local market analysis. Not much attention was paid to incoming and outgoing cash flows, discounted cash flows and other IRRs. In the space of 10 years, the sector has revolutionized its approach and now boasts a real financial arsenal: ERP systems, FP&A, analysts, auditors, tracked and audited financial flows, tools and processes for property valuation, acquisition, management and resale. We even began talking about assets, instead of buildings.

Let's take the example of ERPs, which play a key role in finance – centralizing company data and drawing analyses to guide managers' processes and decisions. Just as in finance, an ESG & Climate ERP is both strategic and operational – synonymous with performance as well as cost and resource optimization.

Let's pause here to note that this financial transformation took the real estate industry about ten years. And now the environmental transition needs to happen in less than five!

Euros, pounds and dollars, make way for CO_2.

Step one: let data do the talking

A successful ESG strategy starts with getting a clear picture. Your first move is to measure environmental performance for each tenant, building, fund, etc., then compile merit orders for each portfolio. As the saying goes, "What gets measured gets managed." Like many worthwhile endeavors, this process is

[1] According to The Net Zero Transition report by Vivid Economics

long, painstaking and not very sexy. But how can you decide which building to refurbish without ascertaining its energy consumption, or whether its consolidated consumption is reliable? Without identifying its heating system or metering plan? Or which meter feeds which building zone?

Into the weeds

The road towards carbon mitigation is long and winding. Not all technical, energy and activity data belong to the owner – but rather to tenants, property managers, and service providers, whose consent is a prerequisite to any data collection. And when it comes to data, many actors are loath to share what they often see as a strategic asset. Reality check: while centralization and easy access are valuable, the information itself often has little worth; what matters isn't having the data, but using it to good purpose.

Getting a clear picture of a building's consumption is not as simple as it seems. Understanding the different types of energy used on-site, the metering plan and zones served (common and private) means involving those who know and manage the building. Setting up the collection and centralization of building data is an essential investment, one that takes time but will save time in the long run.

One best-practice example: remunerating Property Managers for the job of gathering and mining data. Not only does this practice remove the last barriers to information sharing, it also serves to align interests and ensure work quality and timeliness.

Keeping priorities straight... while doing no harm

ESG impact depends on **numerous criteria** whose measurement can be complex, with varying weight and composition from one aggregate indicator to another. The **Life Cycle Assessment** of products (goods or services) has long since established the obvious: it's extremely difficult, if not impossible, to improve several KPIs at once. Prioritizing is a must, and objectives should focus on one or a few key criteria, while trying to **minimize potential harm** in other areas.

Most regulations, like most actors, are focused first and foremost on climate. To make sure that no significant harm is being done in other ESG areas, those aspects should be measured and tracked as well.

Baby steps

There's a wide range of initiatives and projects available to help real estate players with their carbon mitigation strategies: building certification, fund labels, national and international benchmarks, climate and energy trajectories, isolated initiatives, etc. Grand ambitions are good... but a pragmatic approach is better! If there's one thing we've learned after nearly 10 years supporting ESG deployment strategies in real estate, it's the importance of setting priorities and moving forward slowly but surely.

Having complete, relevant information is the key to developing reliable KPIs. Armed with a strong understanding of their portfolios, asset managers can set priorities and focus efforts on those showing the weakest performance or highest risk.

Step two: gathering insights for good decisions

Enter Net Zero. This approach aims to shrink emissions by 90-95% by 2050, then offset any remaining emissions by compensating elsewhere. Supported by initiatives like SBTi, the Net Zero roadmap prescribes the following:

- Focusing on rapid, deep emission cuts from one's own processes (scope 1), purchased electricity and heat (scope 2), as well as emissions generated by suppliers and end-users (scope 3)
- Setting short- and long-term targets, halving emissions by 2030 and eliminating the remainder by 2050
- Claiming a net zero result only once long-term targets are met (90-95% emissions reduction)
- Going beyond the value chain, investing outside the science-based targets to help mitigate climate change elsewhere

Levers to explore

Buy? Sell? Renovate? Don't? These are the questions facing asset managers as they examine assets through the merit order lens to define investment plans, one building at a time. Looking at Scopes 1 and 2, there are five ways to lower greenhouse gas emissions:

1. Reduce need, for instance by influencing user behavior (E.g. in many office buildings, temperature set points result in heating to 25°C in winter and cooling to 19°C in summer. Really? This makes no sense.)
2. Improve maintenance of equipment such as heating/ventilation/AC (E.g. regular cleaning of the air filters in an air handling unit can improve energy consumption by 7%)
3. Optimize the regulation of lighting, heating, ventilation and AC equipment (E.g. making it impossible to heat and cool a building at the same time during the off-season)
4. Replace existing equipment with more efficient and/or better sized equipment (E.g. the latest heat pump technologies offer performance coefficients two to five times higher than older technologies)
5. Reinforce building insulation to lower heating needs (E.g. external wall insulation can reduce heat loss and thermal bridges without losing usable surface)

In addition to this, a sixth lever concerns energy substitution, to favor energies that emit less greenhouse gasses, such as electricity in France or the self-consumption of renewable energies, in lieu of energies that emit more, like fossil fuels.

With regard to scope 3, there are 4 main ways of reducing its impact:

1. Sizing an installation, building or service as accurately as possible to limit the use of equipment, materials and later energy consumption, such as providing lighting on office workstations rather than a uniform level on a whole floor.
2. Choose low-emission construction methods. For example, a square meter of concrete floor requires about 50 kg CO_2 equivalent, while a wooden floor made in France will save about 10 kg.
3. Favor manufacturers who manufacture well-designed equipment in countries where electricity is low in emissions. For example, between two manufacturers of air handling units, a manufacturer in France will offer a lower emission factor per unit produced due to French electricity and the gain in transport, than its peers who manufacture in China.
4. Finally, re-use existing equipment and materials as much as possible. More and more service providers are specializing in collection, reconditioning and reuse. Do we really always need to buy new office furniture or new office carpet when their refurbished equivalents meet the need?

With these ten levers, some high-tech, some low-tech, it is possible to reduce the climate impact of real estate to move towards net zero buildings.

Going high... and low

Some of these efforts call for advanced technology like AI solutions, which use existing data to detect savings actions automatically and remotely. As an example, most buildings in advanced countries today have remotely readable meters providing in-depth interval data that, once analyzed with proper algorithms, offer actionable insights.

But common sense, "low-tech" solutions still play an important role, and cutting CO_2 emissions by 90-95% also calls for some good old-fashioned behavior modification; perhaps we can live with the knowledge that 5% of a given group will be dissatisfied with the temperature in their office building, whatever the temperature.

And although technology has multiplied equipment's energy efficiency (by a factor of ten or much more), these savings have been massively canceled out by the **multiplication of uses**. For example, current smartphones are hundreds of times more efficient than late 90's models, but smartphones' consumption and battery capacity has ballooned. In 1998, a phone was only used to make calls, whereas today's devices are essentially microcomputers with an ever-growing list of uses.

Keeping CO_2 in the equation

A complete net zero approach considers the overall cost of actions taken. As we've seen above, carbon emissions are linked not only to energy consumption and the use of refrigerants (scopes 1 and 2), but also to building and refurbishing materials, services and transport (scope 3). So whatever the action, let's remember that we're evaluating not just financial profitability, but also the climatic effects. For example, in assessing the CO_2 cost of replacing a heat pump or boiler, you'll look at embedded carbon items like equipment manufacturing (metal, electronics, energy of manufacturing plants, etc.) but also the transportation involved in equipment delivery, and the emissions linked to installation, like the use of generators. Once everything is accounted for, you can estimate the GHG emissions avoided and calculate the carbon ROI.

To help with decision-making, action plans for each asset, fund and portfolio are evaluated in terms of these overall costs and effects: financial (expenditures, savings) and climatic (additional and avoided emissions). Note: when prioritizing investments, keep orders of magnitude in mind. For example, to ascertain whether it makes sense to replace fluorescent lights with LEDs, you only need to know if the investment will be around €500k or €1,000k. You don't need an exact quote at this stage.

Getting help

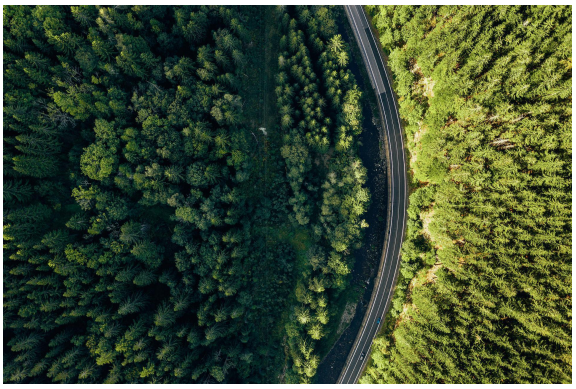
Rounding out your investment approach often requires engineering support for on-site technical audits, especially with projects like replacing equipment or changing insulation.

Once you've defined priorities, chosen investments and identified savings measures, you'll need continued outside support. This is the part where figures are fine-tuned and specifications drawn up, so get quotes or issue a call for tender to evaluate work costs and find the right company.

With asset and investment priorities in hand, asset managers now have their roadmap for decarbonization and a successful ESG strategy. Time for the next step: implementation.

Step three: moving forward, now

If the Paris Agreement objectives are taken seriously, and if the regulatory and economic incentives align interests toward a "net zero" world, the resulting renovations will spur investments on an unprecedented scale. We're talking about over €5 trillion per year, meaning the real estate sector will



likely spend the next two or three decades solely on retrofitting. Future investments should be focused on this.

It takes a village: new jobs and new processes

The entire sector will evolve to reach these objectives. The whole industry must organize to train a "net zero" generation of engineering firms, project managers, contractors, construction and maintenance companies, auditors, consultants and so on. Renovating massively and quickly will require proven processes, reliable measurement methods and solid standards to evaluate financial impact, and so on.

Paradoxically, these new challenges won't necessarily create new professions. However, they will definitely secure existing and create new employment. The evolution of existing jobs through continuing education, certification and other professional accreditations will likely be more effective. The windfall of non-relocatable jobs for each country will be huge. Today, the sector is woefully unequipped to meet even the **current demand for these qualified resources**. If planning starts now, and with the support of educational and professional organizations, career changes toward "net zero professions" will offer a path for millions of workers in search of stable, meaningful jobs.

For asset managers, the challenge is adapting business processes to internalize the ESG reflex, particularly the net zero reflex. This means taking ESG and climate change into account across all endeavors: evaluating an asset acquisition (ESG due diligence), establishing investment plans, monitoring asset performance, contracting with property managers, attracting and welcoming new tenants, choosing qualified "net zero" project managers and general contractors, signing an energy and climate change performance contract, establishing reports for investors, complying with local regulations, arbitrating an asset, and more.

Keep your property managers close

One of the challenges in devising successful portfolio policies is aligning stakeholder interests. Whether in-house or external, property managers are the cornerstone of any strong net zero investment strategy, and they already play a key role in terms of building insights (type of heating energy, metering plans, technical history, etc.) and tenant relations (rental management, data access consent, etc.).
Paying close attention to the renegotiation of their contracts and/or incentivization plans is important for several purposes:

1. To allot more time to new responsibilities: information retrieval and sharing, raising awareness among tenants of issues such as decarbonization and its real-life impact on the building, negotiating leases that include environmental appendixes and negotiated conditions of property use, contracting and managing service providers to implement CO_2 saving actions, etc.
2. To negotiate the prices associated with these additional services.

3. To establish relevant KPIs and monitoring plans, in line with the objectives defined.
4. To define obligations and key success factors.

Once the best laid net zero investment plans are in place, asset managers must prioritize and monitor their implementation. The success of these strategies will then be gauged in terms of real impact.

Measuring impact and gaining momentum

ESG in real estate has evolved slowly but surely over the past two decades. In 2000, most "Sustainable Development" efforts were limited to one-off initiatives mentioned in annual report appendixes. Back then, we took pride in beehives on a rooftop, an organic cafeteria menu or solar shade blinds. Whether well-intentioned or green-posturing, these initiatives were anecdotal in that they failed to address the major issues and their scale.

Since 2005 we've seen the emergence of building labels, with almost every major economy adopting its own standard (BREEAM in Great Britain, HQE in France, LEED in the US, PASSIV'HAUSE and DGNB in Germany, Minergy in Switzerland, etc.). Initially geared toward construction, these labels have evolved to address building operation (BREEAM in use, HQE Exploitation, LEED Eprom, etc.). They've obviously been helpful in several ways: raising awareness within the real estate and construction sectors, promoting communication among actors and providing a readable reference for tenants (who are often more novice). But their broad scope and disparity, combined with inconsistent/unsustainable performance levels over time, have made them essentially a race for medals. Although constantly evolving and far from obsolete, these labels are now refocusing on less exhaustive goals.

Starting in 2010, the emergence of observatories for energy, climate, ESG and sustainable building performance has allowed market players to compare themselves to each other, to positive effect. The BBP in Great Britain, the OID in France, EnergyStar in the US, GRESB in the Netherlands, ECORE in Germany... These new groups offer a means for real estate actors looking to compare the performance of buildings or funds. Beyond the undeniable evangelizing role of their initiatives, these observatories have led to the market's first benchmarks. But with data that's annual, declarative and often not very representative, the limits of this system soon became apparent. It's hard to push for action when you're within the average, and even more so without knowing if different building types are taken into account. These observatories have adapted by federating the most committed actors (early-adopters), developing and sharing guidelines and practices, and representing real estate interests to government authorities.

Carbon reduction pathways: science doesn't lie

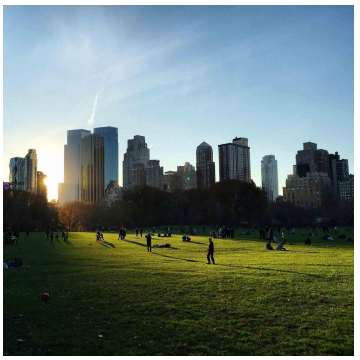
Since the late 2010s, new standards have emerged to encourage action: CRREM in Europe, the Climate Change Committee in Great Britain, the Tertiary Decree in France, the finance sector's SBTi initiative... Carbon reduction pathways are the irrefutable reference today, setting science-based standards based on a methodological approach:

- Establishing future projections of greenhouse gas emissions
- Objectifying the commitments made (KPIs are expressed as an absolute value, based on a known indicator for a given date)
- Objectifying each building's particularities; whatever its use, it must reach net zero by 2050

More than just a set of regulations to meet, or a way to appease and attract stakeholders, these new standards have a real impact on the value of assets and portfolios.

Markets expect that assets will be held to increasingly strict ESG requirements, and that straying from the path to decarbonization will lead to devaluation. The risk of this "brown discounting" and the associated "stranded assets" have begun to eclipse the issue of green premia.

Saving the planet and beyond



Since 2020, real estate actors have been getting to grips with the stakes of decarbonization and the need for climate change resilience. The sector is facing a real revolution, with uncharted territory ahead.

With all its demands and difficulties, today's reality represents an exceptional opportunity for the real estate sector as a whole. With the right efforts and smart investment, we can be a force for good around the world: creating millions of jobs, lowering the cost of living, improving energy independence and beyond.

About Vincent Bryant

Vincent Bryant is the CEO and co-founder of Deepki.
His passion for energy goes all the way back to his early professional days. Vincent began his career with an energy consulting firm, before spending eight years at ENGIE as Energy Efficiency Director.

In 2014 he created Deepki with Emmanuel Blanchet, driven by their shared vision: using data to make real estate more sustainable.

About Deepki

Founded in 2014, Deepki has developed a SaaS solution that uses data intelligence to guide real estate players in their Net Zero transition. The solution leverages customer data to improve assets' ESG (Environmental, Social and Governance) performance and maximize asset value. Deepki operates in 52 countries, with over 400 team members across offices in Paris, London, Berlin, Milan and Madrid. The company serves clients including Generali Real Estate, SwissLife Asset Managers and the French government, helping to make their real estate assets more sustainable at scale.

In March 2022 Deepki raised €150 million in a Series C round of funding which was jointly led by Highland Europe and One Peak Partners. Other investors include Bpifrance, through their Large Venture fund, and Revaia.

For further information about Deepki's end-to-end ESG solutions, visit: www.deepki.com