ESG DATA OPTIONS
Inside the Building

produced by Concrete Ventures

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How To Read This Report

WHO IS THIS FOR?

- RE owners, operators and occupiers who need to meet ESG targets or want to improve their environmental performance

- Property development and product development teams who are looking to innovate the construction process

- Executives and senior management who need to understand the subject broadly and the key areas they should consider focusing on

- Consultants who want to help RE clients meet their ESG targets

WHAT DO WE TRY TO COVER?

- We highlight the more interesting / illustrative examples we came across, and 'see also' others. They are not specific recommendations

- <u>Software</u> and <u>Product-centric</u> startups that produce data INSIDE a building that impact your ESG footprint & strategy. Less service businesses

- Who you should know about / think about / talk to

- Concrete partners have access to the full spreadsheet of research underpinning this

WHAT WE DO NOT COVER IN THIS REPORT

- Specific recommendations for your building / portfolio or 'who is the best'. That would require a deeper / different kind of work

- The big incumbents (Honeywell, Siemens, Johnson Controls, MRI, etc)

- Lots of other important ESG things that are not in-building data-producing technology, like; Construction, Carbon Offsetting, Novel materials for construction, Circular economy

How does Concrete think about this?

1. What kind of value do they primarily create?		**RECORD** Data gathering incl. some suggestions to improve	**REDUCE** Automated controls to drive down usage/cost	**REPORT** **Compliance** focussed reporting, benchmarking, long-term planning
	ELECTRICITY		▮	▮
	BMS		▮	
2. What system do they primarily deliver value through?	**HVAC**	▮	▮	
	LIGHTING		▮	
	IOT-ENVIRONMENT		▮	
	IOT-OCCUPANCY	▮		

Data Management & Reporting

"How do I calculate is my portfolio's environmental and social impact and how do I manage this data?"
– Owner & Operator

WHY?

This is where it starts and ends. Everything on the subsequent pages is driven by this and feeds back into this.

GRESB, WELL, BREEAM, LEED, EnergyStar, etc

Soon required for all insurance and debt.

You'll use consultants, or if internally run, one of the companies listed here.

CAVEAT : We are painfully aware that there is currently no data standard for this information in any individual country, much less across borders. Hence portability across providers, normalisation across countries, and 'handovers' are future problems to be solved.

VALUE PROPOSITION

✓ Data.

✓ Reporting.

✓ Benchmarking.

✓ Planning & tracking to Net Zero.

NOTABLE PLAYERS

Measurabl - SaaS platform for collecting, managing, disclosing and acting upon CRE ESG data. Acquired Hatch to deepen realtime in-building data-capture.
- *Global leader, active in over 80k commercial buildings across 90 countries.*
- *1.1BN sqm covered*

Deepki - Similar to Measurabl with added maintenance component.
- *Market leader in France*
- *400m sqm covered*

Building Minds – Schindler funded startup using Microsoft platform technology.
- *Well-funded DE reporting provider*
- *65m sqm covered.*

Others include: Lots of consulting companies like Evora, Switch Automation, Clarity.AI, Carbon Intelligence, ARbnCo, Envizi (IBM)

Photograph: Measurabl website

Electricity Management

"How do I best optimise the overall power I am producing / consuming in my building?"
– Owner & Operator

CONSUMPTION   < >

PURCHASE /
DEMAND-RESPONSE   < >

PRODUCTION

Measurable.Energy = "small power" smart 'plugs' / light / hub (40% of building energy) - reduced 36% in trial

Grid Beyond - Multi-level platform to track usage and optimize power purchasing

Blueprint Power - Turns buildings into power plants (acquired by BP) – software centric and connects via demand-response to provisioning partners

Grid Duck - Dashboard and suite of peripherals (sensors, plugs, etc) to monitor & control. Uses mesh-based Zigbee protocol

Aurora Solar - Uses Google Earth to assess solar projects at scale. Economical way to get a very large multi-asset estimate on PV installation for your portfolio

Also: Verv energy, Sapient, Verdigris, Vutility

Also: Pexapark, Zeigo, Next VPP

Others include: Voltus

The Building Management System

"What's the right BMS solution for this building? "
– Owner & Operator

WHAT IS IT?

Central to FM is the BMS which in most cases is not optimising what's happening in your building. This data-source is core to a wide range of technologies that optimise various aspect of a building's energy consumption

Siemens, Johnson Controls, etc are the IBM of the BMS world. Or nothing, lots of buildings have no central BMS

While 80-90% of buildings have something old which needs to be augmented, new-builds have the option of replacing the BMS with a new wave of players

General consensus is 'commissioning' the BMS is the source of most of the inefficiencies. Therefore, multi-input real-time optimisation seems to be the solution

VALUE PROPOSITION

✓ Full stack solutions promise (obviously) better interaction between systems, and a user-centric approach - instead of a list of faults that are unclear or unresolvable

✓ If you have bought IBM – you'll look at a range of add-on products to help it behave optimally

✓ If you have an 'old' one (that is, no Cat-6 cable connection) – reading it will require "the box" which is available from some players on the next (HVAC) page

RIP AND REPLACE UPSTARTS

75F - This is a full rip-and-replace BMS solution. They brand all their own hardware, including sensors.
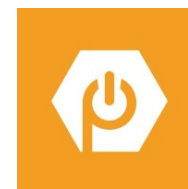
Passive Logic - Full-stack BMS replacement platform including own-brand monitors, boxes, control modules, etc. Recently raised $15m from Brookfield and others to a total of $62.5m to date.

HVAC – 40% of Energy

"How do I optimise my heating / cooling / environmental controls?"
– Owner & Operator

WHAT IS IT?

While not your first stop (install LED lights) HVAC is where the big initial wins will come from

Usually its realising that your building is running chillers and boilers at the same time

Then its from heating rooms that have no people

There are so many players in this space…

VISIBILITY (RECORD)

The below players gained ground with their ability to connect to older BMS platforms and move data to the cloud. This enabled new insights that the owner could act upon

Demand Logic – Hardware data capture from BMS (and some IOT) with a primary focus on identifying HVAC conflicts. No automation

Enertiv – Building data capture & improvement recommendation platform. Includes bill-scanning and a range of hardware installs like current measurement. Supports planning and maintenance modules

Aquicore - BMS data capture (and other sources) to produce operating recommendations

AUTOMATION (REDUCE)

Brainbox.ai HVAC automation platform to reduce energy and increase comfort. 25-30% in < 90 days. Also working on demand-response. $24m in Oct 2021 from ABB. Wide range of modules to meet operator needs including digital twin, maintenance scheduling, and tenex app. Office-centric product

Envio - Building data capture & control platform. Box connects to BMS, able to import IOT data, makes recommendations and automatic adjustments, enables remote login

GridEdge - HVAC AI platform (Edge2X) that uses external air temp to forecast energy demand. Also addresses load balancing with batteries. Raised £2m from BP, others

Others include: Turntide motors, ClevAir, R8, Enerbrain, Fabriq, Facilio, Aedifion

Lighting – 20% of Energy

"Once I install LEDs and turn off lights in unused spaces using smart PIR – what are my options to further optimise lighting?"
– Owner & Operator

WHAT IS IT?

Aside from hardware players like Philips smart lighting, this is a new domain where Concrete has not yet seen significant activity in startups

The ones we have seen all rely on installing network-capable controllers on nearly every lighting fixture – and providing a 'luminal twin' software solution to enable full programmability
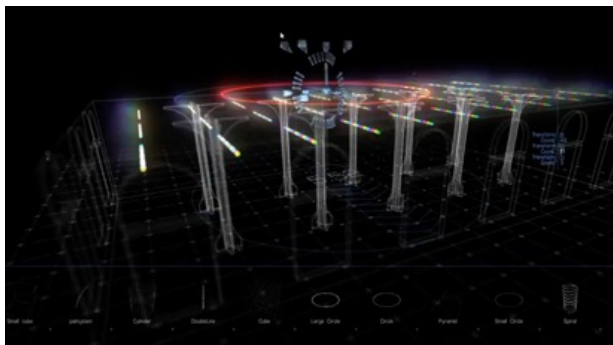
VALUE PROPOSITION

✓ Further energy savings

✓ Power and attractive new visual display

✓ Behaviour influence using light levels

NOTABLE PLAYERS

MyMesh - Dynamic lighting control to achieve targeted behaviours / savings (eg in parking garages). A bespoke service provider productising their solution.

View Smartwindows – Big caveat here – the company is struggling - but the premise is smart windows that optimise interior light levels and reduce energy usage dynamically.

Others include: BuildingOS (Atrius), Physee,

...

Environmental Sensor Data (Temp, Air, Sound, Light, Leaks)

"How do I effectively add this next level of data into my building management strategy?"
– Owner & Operator

WHAT IS IT?

There are a wide range of sensors for environmental measurements. Air quality is obviously at the top, whether pollution (particulate), productivity (CO_2), safety (VOC), or other metrics

There are thousands of sensor manufacturers. While there are some novel approaches (eg Disruptive Technologies very small tiles) we expect this technology evolution to undergo massive leaps in miniaturisation and cost reduction in the coming decade

Thus we focus on the aggregators of IOT data

VALUE PROPOSITION

✓ Tenant well-being

✓ Security

✓ Productivity (CO_2, workflow support)

✓ Energy savings (2nd order)

NOTABLE PLAYERS

INFOGRID

Infogrid researches the best for their clients and sells other peoples' sensors and binds the data streams into workflow-centric solutions. It's a no-touch no-engineer install generally, driving specific cost savings to clients. Cleaning, monitoring, etc.

MAPPED

Mapped - Data infrastructure for iOT (a secure API) BMS-connectable. Wide range of applications

4D monitoring

4D Monitoring is similar to Infogrid in that they deploy third-party sensors to a variety of problem sets, however their focus is on ESG-centric data. Working with Nuveen, Shaftesbury, Crown Estate, etc.

Others include: Disruptive Tech, Omni Systems, SkySpark / Haystack
Water: WINT, AquaGratis, SmartVatten
Air: Wynd, Airthings

Occupancy IOT

"What / where / when are people doing in my building?"
– Owner & Operator

WHAT IS IT?

The ability to track people movement in a building has created myriad new opportunities for differentiation. What once was a costly 'how many heads came into this shop' is now able to track a wider range of insights confidently which previously were only obtained through costly surveys

Beyond easy reach of GDPR lie tantalising insights into demographic and behavioural insights – we do not cover these here but would be happy to discuss

Your basic "is someone in this room" smart PIR is no longer novel, but innovation is happening in temperature, video, and even alternative electromagnetic frequency analysis

VALUE PROPOSITION

✓ Presence

✓ Dwell time

✓ Activity type (eg falling, fighting)

✓ Safety

✓ Cachement (where from?)

✓ Entity types (cars, scooters, prams, etc)

NOTABLE PLAYERS

VergeSense - A good example of a fairly common approach to occupancy analytics – using a non-intrusive camera – and focusing on strategy support for teams

Fyma is one of a number of AI / CCTV solutions – Fyma is a low cost video-feed analyser that will count many different entity types on demand

Xandar Kardian - A novel approach to occupancy using radar sensors in the building. It can detect things like heart-rate so probably more health-care centric

Others include: SimpliSafe, PointGrab, Unifi.ID
Other AI/CCTV: DeepNorth, Digeiz, Auravision,

Thank You

Our success revolves around our proven ability to connect the world's leading owners of real estate with the entrepreneurs and innovators who are redefining how we live, work, and interact with the built environment.

Concrete Ventures was created to respond to the need for a venture capital firm specialising in disruptive property technology in the UK, EMEA, and internationally.

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