Sustainability Technology Activity Index (excerpt)

DATA INSIGHTS

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Tech Market View
UK DEPTH GLOBAL TRENDS

SUSTAINABILITY TECHNOLOGY ACTIVITY INDEX

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ABOUT THIS REPORT

This report launches TechMarketView's new Sustainability Technology Activity Index research. It contains our analysis of the contribution that emerging and enabling technologies make across a range of environmental sustainability use case areas (globally, as well as with a look at the EMEA region and UK&I in particular), including trends and data covering key market sectors and supplier activity during Q4 2022 (and with a lookahead through 2023 and beyond).

It contains our market definition (i.e., what we mean by "sustainability" in the context of our research, and which technologies we're tracking), the methodology and approach we took when undertaking the research (i.e., which milestone events in the lifecycle of projects and products / services we logged—involving whom, why and when).

We present key facts and figures on the state of the market across sustainability-related use cases (namely, the most active suppliers in UK&I, EMEA and worldwide, the most common use cases and the most-commonly used technologies—with examples), and with insights into which technologies are being used in each use case activity, and which use cases each technology is being deployed in.

We also extend our coverage of examples with case studies that explore projects / product deployment in sustainability scenarios, with analysis of the benefits being seen.

Finally, we summarise key findings from the research in terms of market shaping trends, providing advice and recommendations for SITS suppliers on the challenges they face.

TechmarketView is grateful to the support provided by CGI and Ordnance Survey, and Foresight Group and Salesforce, in the research and production of their case studies.

MARKET DEFINITION

WHAT DO WE MEAN BY 'SUSTAINABILITY'?

We recognise that, whilst often synonymous with environmental concerns and greenhouse gas (GHG) reduction, the term "sustainability" does have a wide (and often unclear) remit. The UN's Sustainable Development Goals (SDGs), for instance, cover interests as wide-ranging as education, work and economic growth, poverty and hunger, infrastructure, health, equality, justice, and so on; as well as the more (explicitly) environmentally-focused issues around climate action, biodiversity, clean energy, and arguable cross-overs with clean water and sanitation, sustainable cities, etc.

For the purposes of this report, we've used the term sustainability to refer to activities which have a focus on environmental concerns (but nevertheless have still cast that net fairly wide). Consequentially some of the activities within our scope *do* have wider social implications—for example, the impact of habitat destruction on human health and wellbeing (addressed under *Nature monitoring & management*); how communities are able to benefit directly from targeted *Circular economy* initiatives, etc.

NB Even in those cross-over case, we're focusing mainly on *environmental* credentials for the Index; wider considerations of social value are addressed in our companion research—see Social value in UK central government. Nevertheless, the range of climate-conscious use case areas we've covered is still vast.

TAXONOMY

HOW DO WE CATEGORISE SUSTAINABILITY USE CASES?

For the *Sustainability Technology Activity Index*, we've developed a taxonomy that groups activities by over-arching area (as per the table overleaf), with examples ranging across specialist domains (such as GreenTech, AgriTech, FoodTech, FinTech, RegTech, PropTech, etc.). However, we're not interested in the niche technologies *per se* (e.g., how low-carbon concrete for construction projects is actually manufactured, or the machinery deployed in vertical farms, etc.). Rather, our focus is on the contributions a range of emerging and enabling technologies are making as essential tools for those working towards a more (environmentally) sustainable world.

Acknowledging that there are frequently cross-overs between use case areas which are often lost when attempting mono-classification, we've tagged the examples so that a single project or product could appear in more than one list (for instance, a project designed to safeguard biodiversity in agro-ecosystems would show up under *Nature monitoring & management* as well as under *Agriculture & food*; one that 3D-prints furniture using recycled plastic, lowering the GHG emissions associated with the manufacturing process, ticks boxes for *Industrial process innovation*, *Supply chain optimisation*, and *Circular economy*).

TAXONOMY

WHICH SUSTAINABILITY USE CASE ACTIVITIES DO WE TRACK?

AREA	ACTIVITY	DESCRIPTION / EXAMPLES
Data & decision-making	ESG Reporting	Data integration, extraction, and collection; carbon footprinting, reduction, and reporting
	Nature monitoring & management	Monitoring and verification of natural resources and their biodiversity; waterway clean-up
	Strategy & planning	Data-driven planning to integrate positive environmental policies into wide business ops
Goods & services	Agriculture & food	Regenerative carbon-friendly agriculture & aquiculture, vertical farms, alternative proteins
	Circular economy	Heat recovery; total product lifecycle management: returns, resale, recycling, etc.
	Green finance	Carbon trading, Regenerative Finance (ReFi)
	Green IT	Virtualising & optimising workloads to reduce energy usage; water & power policies
	Industrial process innovation	Electrification of heat sources, green manufacturing practices (e.g., reducing waste)
	Supply chain optimisation	Smart routing, tracking resources, provenance of sustainable goods; waste management
Lifestyle & logistics	Sustainable, smart buildings	Building utilisation, energy reduction; sustainable construction; smart city planning
	Transport & travel	Micromobility networks, EVs; logistics; sustainable air travel, road & rail infrastructure
Power & utilities	Carbon capture & removal	Direct air capture, carbon sinks (soil, rocks, ocean); biomass processing, etc.
	Energy generation	Renewables (solar, wind, tidal, hydrogen); geothermal, heat pumps; sustainable fuels
	Energy storage	Battery management, decentralised V2X EV 'battery cloud' power storage
	Energy supply	Smart grids, microgrids (prosumer networks)

Source: TechMarketView

TAXONOMY

WHICH EMERGING & ENABLING TECHNOLOGIES DO WE TRACK?

In defining what we count as 'emerging and enabling technologies' in sustainability use cases, we've expanded upon the TechMarketView software and IT services (SITS) 'New' technology definition used in our proprietary Digital Evolution Model (DEM) and added some with more hardware overtones (such as 5G, 3D-printing, robotics).

This is because we believe that they're key to the development of some of the innovations making inroads across our sustainability use cases. It's a wide range of tech, deployed across both traditional IT and OT (operating technology) scenarios—highlighting that there's often a rather blurry line between the two nowadays.

We're tracking how this tech helps to deliver the projects and products deployed across our range of sustainability-related scenarios; and we're doing so by capturing information about how these technologies are being used *in combination*. That's because it's rare to encounter, say, a pure-play blockchain project (unless you're just minting tokens or mining crypto).

Examples we see include AI and robotics assisting in solar panel maintenance (something that would be logged under *Energy supply*); using AI and IoT to develop an energy consumption model for smart buildings (which would be filed under *Strategy & planning, Energy supply*, and *Sustainable, smart buildings*), etc.

TECHNOLOGY	DESCRIPTION / CONTEXT
3D printing	Supports distributed manufacture, recycling
5G	Next-gen wireless tech; often private networks
AI & ML	Predictive & generative artificial intelligence, machine learning, and deep learning tools
Analytics	Predictive analytics, business intelligence
AR/VR	Augmented, virtual, and mixed reality
Automation	RPA & intelligent automation, low-/no-code
Blockchain	Distributed ledger technologies & immutable centralised ledgers, multi-party computing
Cloud platforms	SaaS, PaaS, IaaS
Edge computing	Distributed compute & storage, sited closer to data sources (away from enterprise core)
Geospatial	Spatial imagery and other Earth observation
IoT (Internet of Things)	Sensors & instrumented devices, messaging, data-gathering and control technologies
Quantum	Quantum computing (c/w classical compute)
Robotics	Robots, drones

Source: TechMarketView

METHODOLOGY

WHICH ORGANISATIONS DO WE WATCH?

In collecting data for the Sustainability Technology Activity Index we have established a 'watchlist' of over 1,300 organisations worldwide that we've identified as having an interest or stake in at least one of our sustainability use case scenarios.

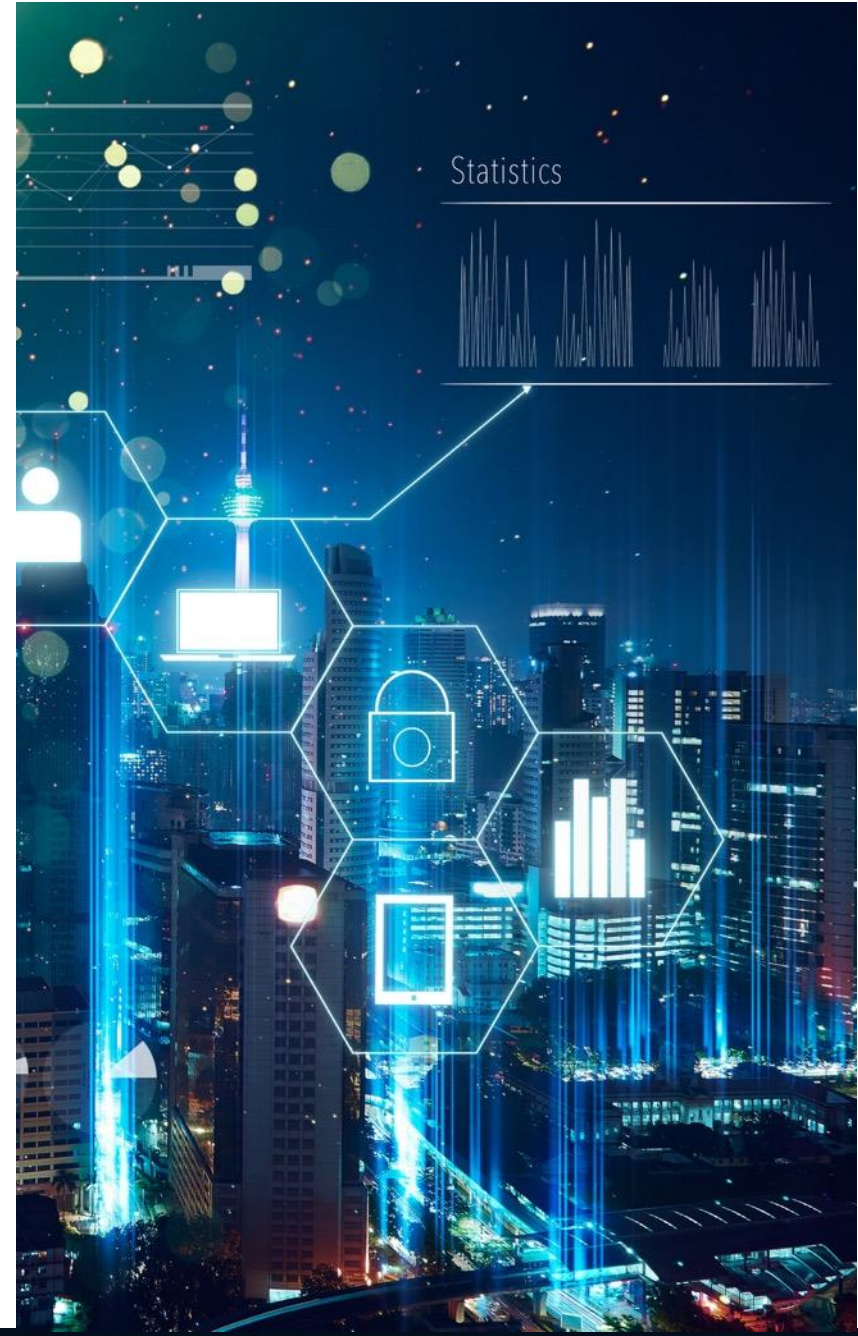
This list includes both software and IT services suppliers with a wide-ranging portfolio (where emerging technology offerings are being applied in sustainability-related contexts); and specialist players, focused on one or other sustainability use case area in particular.

In addition, to improve the breadth of the Index's coverage (capturing details of activities from a technology consumer perspective), our watchlist also includes end user organisations that make use of emerging and enabling technologies to drive a sustainability agenda in their own business (and for their own customers).

The global reach of our watchlist (reflecting the global nature of sustainability issues) has meant that we have been able to include details of supplier involvement in activities beyond the UK (TechMarketView's traditional market scope) in our charts and analysis.

Charts denoting the popularity of various use cases or involvement of technologies are taken at the *global* data level. However, we have split out data on supplier involvement to provide charts on the top 'most active' suppliers in UK&I, EMEA, and worldwide.

Please note that if an organisation on our watchlist didn't feature in the Index this time around, that doesn't necessarily mean that they're not involved in any sustainability-related activity—just that there wasn't an example of such an activity culminating in an announcement which met the qualifying criteria during the monitoring period. Their time will come in future iterations of the Index.



METHODOLOGY

WHICH ACTIVITIES ARE IN SCOPE?

The Sustainability Technology Activity Index is designed to track milestone events that indicate a 'state change' in the development and production of sustainability-related solutions. These can include the launch of a pilot project, the addition of a major consortium partner name at a new stage of development, the transitioning of a pilot into a (more widely-available) production service, scaling up a service and/or adding significant public reference customers, etc.

In each case, the occasion connotes some degree of momentum and ramping-up of the activity as it moves closer to mainstream adoption (or widens its existing appeal).

We've concentrated on milestones (in any of our use case areas and activities, involving any of our emerging and enabling technologies of interest) which were flagged during Q4 2022 (i.e., between 1st October and 31st December of that year). For this period, we logged information regarding use case types, technologies employed, suppliers and end users involved, dates, and countries/regions operated on over 340 qualifying examples of activity.

Individual entries were tagged to multiple use case activities, areas, technologies, suppliers, end user organisations, countries and regions (if relevant). We chose this methodology (rather than simpler one-to-one categorisation) to better capture the cross-over applicability of projects and products to service different customer needs (potentially addressing the requirements across multiple use cases), and the reality of putting a range of technologies to use in combination in order to get the job done.

If an activity fell outside of scope (for instance, because it didn't utilise any of the technologies of interest, or it achieved the relevant milestone status outside of the October—December 2022 monitoring period) then it didn't make the Index this time around. That's in no way a comment on the quality of a project or product itself by any other metric, just that the initiative in question didn't meet our criteria for inclusion (since we're looking to compare activity across a consistent timeframe to track use case area interests and technology deployments over time).

Note that our 'tagging' approach has the effect the percentages in charts may not add up to 100%—because a single entry may be tagged with multiple use cases and/or technologies.

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Craig Wentworth joined TechMarketView in April 2023 as a Principal Analyst across the TechSectorViews and PublicSectorViews research streams, with a focus on Education, Local & Regional Government, Sustainability, and Emerging Technologies.

He has 30 years of experience in technology and change across the commercial and public sectors, in a broad range of roles (including analyst research, consultancy, technology strategy, innovation, and service delivery).

Before joining TechMarketView Craig ran the UK-based analyst firm Independent Thought, where he focused on blockchain, IoT, AI, and innovation. Prior to that he held various analyst positions at IDC, MWD Advisors, and Ovum; as well as spending nearly 20 years in the UK Education sectors—working in universities and national bodies, managing IT services and leading large-scale innovation programmes.

Craig has an MEng (Hons) in Computer Systems & Software Engineering from the University of York.

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