Space and Green Finance – a major growth opportunity

As the world moves towards a Net Zero, decarbonised economy, significant amounts of public and private sector finance will be deployed. The McKinsey Global Institute estimates the transition to Net Zero will require capital spending on physical assets for energy and land use systems of $275 trillion between 2021 and 2050, nearly $9.2 trillion per annum.\(^1\)

Wise and effective deployment of ‘green finance’ will require significant due diligence, informed by a new generation of metrics and analysis much of which space technology is uniquely positioned to provide. Regulatory demand is rapidly evolving to enforce claims made by corporates and financial institutions. It is simply no longer going to be possible to claim to be green. Regulators, watchdogs and social activists are sharpening their teeth to demand that the “green” is demonstrable, verifiable and meaningful.

Satellites already play a significant role in the Net Zero story. Data from scientific missions, commercial satellites and operational weather programmes are central to our understanding of the changing Earth system. They inform public opinion, government policy and commercial operations. Demand for such data and the intelligence it can glean is increasing rapidly. For instance, the 2022 EU Space Agency/PwC market report forecasts that finance and insurance will represent 21% of the global market for Earth Observation (EO) data and services by 2031.\(^2\) This is over and above continued growth in use of EO data for academic research and public information services that, combined, yields a total global market for EO worth $2.7 trillion.\(^3\)

These positive trends mask a significant array of barriers and challenges to wider uptake and use of satellite-derived data and services in support of the Net Zero transition. Not least is the fact that emerging and future information needs are only just becoming clear. For instance, the wide acceptance of the Taskforce for Climate-related Financial Disclosure (TCFD) standards for corporate reporting on climate-related financial disclosure is driving a demand for market data and analytics that is not yet fully understood. Current data sources are unlikely to be adequate to meet all demands implying that those companies and investors that understand the new wave of demand will be in a prime position to capitalise on growth of the sector.\(^4\) In addition, few of these “new” consumers of data know where to go to find it: the need is not simply for data. There is a need for a new ecosystem of data providers, data aggregators and people who translate that data into usable information to help these consumers migrate to the new regulatory and operational environment. They need data to comply in the new world, but also help to understand how to collect and use the data that they need. Simply put, organisations recognise that they must move to comply with the requirements of TCFD or ESG, but they do not know how to do so. These complex, data centric, financial information systems are things that the UK has traditionally excelled at.

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\(^2\) Source: EUSPA EO and GNSS Market Report ISSUE 1, copyright © EU Agency for the Space Programme, 2022. Insurance and finance estimated to see rapid uptake of EO data services, growing from ~5% to 21% of global market between 2021-2031.

\(^3\) Australian Space Agency (2021), Earth Observation from Space Roadmap 2021-2030, November, available at space.gov.au. Figure includes all activities associated with the practice and science of EO.

Forging a new partnership

The UK National Space Partnership (NSP) believes that space data in support of the transition to Net Zero is a major opportunity for the UK. There are four key reasons for this:

1. UK is one of the first countries worldwide to commit to Net Zero transition, enshrined in the Climate Change Act 2019;
2. UK is home to world leading financial centres in London and Edinburgh that support as much as 20% of national GDP;
3. The UK has published ambitions to lead the world in Green Finance, with related ambition to grow businesses that excel in environmental and climate data analytics;
4. UK has a thriving space sector and strong supporting academic and research community that is ready to collaborate with the finance sector to build the required data solutions.
5. The UK has deep levels of expertise in data systems and analytics – within space and finance but also across other nationally significant sectors such as healthcare.

What does not yet exist is a forum that brings together the various stakeholder communities to establish an agreed view on the opportunity, the issues that remain to be addressed and the mechanisms that can be employed to tackle such issues in a manner that creates opportunity and advantage for UK space and finance stakeholders alike. With this in mind, the purpose of this document is to seek consensus on the following topics:

1. Need and opportunities for linking green finance with existing and new data and intelligence;
2. Issues and barriers to growth that need to be identified and addressed;
3. Options for a way forward to tackle those issues that is market led and represents growth opportunities for the space sector.

In stimulating this discussion, the NSP wishes to align support from a variety of relevant stakeholders that agree on the opportunity before us and are willing to join forces in taking action.

Green Finance – a world of opportunity

Green Finance is both a description of a system of finance and a category of transactions and funds that purport to meet green investment or sustainability criteria. As a system, Green Finance is a mirror of the normal investment chain (see Figure 1). Players in the green investment chain fall into a number of groups:

1. Financial economy: including:
   a. Institutional investors (asset owners)
   b. Investment managers (managers of assets on behalf of institutional and retail investors),
   c. Banks (debt finance providers and sometimes equity finance. Structuring, M&A etc. Some banks own asset managers)
   d. Insurance companies (insurers of assets, owners of assets and owners of asset managers)
   e. Development finance institutions (owners of assets and promoters of government objectives that may extend beyond purely financial returns into ESG, development and political goals)
2. Real economy: Companies that make corporate investments into SDG related goals. These companies are financed, owned, insured and lent to by the financial economy;
3. Foundations and philanthropic groups: making ‘social investments’ and seen as straddling the financial/real economy;

4. Government and public at large: including sovereign wealth funds, regulatory bodies and citizens.

Figure 1: Green Finance system (Source: Private Sector Investment and Sustainable Development UN Global Compact, 2015)

As a category of funds, Green Finance is witnessing unprecedented growth. For instance, the 2020 Global Sustainable Investment review suggests that global sustainable investment reached USD35.3 trillion in five major markets, a 15% increase in the past two years (2018-2020). However, there is considerable concern over the levels of transparency and accountability regarding definition of green investment and a worry of ‘greenwashing’. Savvy investors are seeking greater clarity on green finance investments and whether they meet expectations for investments that truly contribute to a Net Zero future. With such issues in mind, the HMG Greening Finance Strategy builds upon the twofold notion of:

- Greening finance: mainstreaming environmental and climate factors into the operations and activities of financial organizations.
- Financing green: mobilising public and private finance to meet the needs of Net Zero investments.

A central aspect of the Greening Finance Strategy is positioning the UK at the forefront of green financial innovation, data and analytics. This includes enhancing climate-related and environmental data and analytics and promoting dialogue with regulators and industry to support innovation. A major input to this process of innovation will include greater access to, use and provision of data acquired from the vantage point of space. This is critical to ensure that there is no loss of faith in Green Finance once green washing is identified, named and shamed. It will facilitate the implementation of effective investment and metrics to support – an area where the UK has all the tools needed to establish global leadership (and pre-eminence).

Defining the opportunity

There is much stated ambition, but, currently, no single or comprehensive definition of the Green Finance community requirements with respect to climate or environmental information exists to support the transition to Net Zero. A good starting place is the Spatial Finance Initiative report on Next Generation Climate and Environmental Analytics for Resilient Finance. The report distinguishes

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7 https://www.cgli.ac.uk/spatial-finance-initiative/
between use of geospatial data (including satellite imagery) for industry agnostic insights and industry specific insights:

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<th>Industry agnostic insights</th>
<th>Industry specific insights</th>
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<tr>
<td>Physical climate risk (heat stress, intense storms etc)</td>
<td>Commodity trading intelligence</td>
</tr>
<tr>
<td>Nature and biodiversity risk</td>
<td>Agricultural financial products</td>
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<tr>
<td>Natural catastrophe (re)insurance</td>
<td>ESG Risk and impact assessment</td>
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<tr>
<td>Supply chain monitoring</td>
<td>Parametric insurance products</td>
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These outline applications cover a wide range of data types and applications but are not easy to understand in terms of their contribution to climate mitigation (the reduction or removal of GHG emissions) or adaptation (increasing resilience to climate change driven shocks). Neither do they explicitly address the common language of finance and financial risk exposure. What is clear from the report is the growing demand for data-driven insights and the urgency for solutions that make a quantitative, demonstrable contribution to a Net Zero finance system. These solutions need to be integrated into real world use cases and to facilitate transition within the economy as it currently functions.

Barriers to market growth

In addition to a lack of clear expression of needs from the various sectors of the Green Finance community, NSP research has identified several challenges to the increased adoption of satellite and related data for Green Finance applications. For instance, a recent report by WWF and the World Bank assessed and supported the increased use of EO and other geospatial data in the domain of ‘spatial finance’\(^8\). The report identified a significant number of barriers to further progress including:

- lack of reliable asset level data at required granularity and regularity;
- lack of supply chain data at required granularity;
- poor adaptation of observational climate and environmental data in financial applications

The issue of poor asset level data arose multiple times in discussion with stakeholders wherein satellite imagery needs to be combined with other asset information (ownership, value, etc) to provide a better resource for portfolio analysis and physical risk assessment. The report calls for action to bring relevant stakeholders together to tackle these issues, guided by the needs of the Green Finance community but engaging an appropriate mix of data suppliers, sector experts and enabling technology providers.

In summary, the major factors inhibiting the growth of the ‘spatial finance’ sector include:

- Data confusion - complexity of data sources and suitability of specific datasets to particular analytical tasks;
- Lack of complete data records – data gaps and incomplete temporal/spatial datasets;
- Poor product fit – lack of product tailored to specific financial needs and demands;
- Inappropriate use of some spatial data products – such as using long term climate projections to establish short-medium term regional impact so climate change;
- Lack of a comprehensive ‘marketplace’ for data and solutions with known applications;
- Lack of standards to endorse the application of data to certain analytical tasks.

There are likely to be many more factors and NSP welcomes feedback and comment on those that are important to specific members of the Green Finance community.

A call to action

Many of the challenges set out here can be addressed by coordinated dialogue and targeted research and development. Others can be overcome with a clear focus on intended application by end users and value propositions shared by multiple potential customers. Some data gaps and capability limitations can be addressed by designing data acquisition and integration systems in partnership with customer communities – for example, satellites designed purely for the needs of insurers? Or could we combine EO with communication systems that send actionable information direct to end users? Much can be done to improve access, usability and suitability of available data particularly when combined with customer owned data within a comprehensive data sharing (open data?) framework. There is goodwill and clear intent amongst large and prestigious stakeholders, asset owners and financiers to find pathways to easier implementation and effective deployment. These stakeholders would respect and welcome the convening power of NSP and provide resource to support the dialogue envisaged in this document.

Questions to address

1. What are the highest priority applications and data needs of the Green Finance community and how could they be better articulated to solution providers?

2. What are the main barriers to increased uptake of satellite data solutions and how can they be overcome?

3. What gaps in observational capacity exist and can they be profitably met by deploying emerging, affordable satellite missions an constellations?

4. How should data and resulting information be monetised and captured by the market? From this, what is the optimal business model for service delivery?

5. What are the correct and appropriate ongoing roles for public and private stakeholders in the delivery of climate and environmental data solutions?

6. What is the best model for bringing key stakeholders together and who should be part of the dialogue?