

SPRINT funds collaborative projects with many companies across the UK, with the outcomes of many of these projects and the missions of companies leading them, helping to contribute to the UN's Sustainable Development Goals (SDGs). This was summarised in a previous [report](#) that identified and summarised the most frequent Goals, directly and indirectly linked to SPRINT projects.

The top three most frequent Goals were:

- **SDG#9** Industry, Innovation, and Infrastructure
- **SDG#12** Responsible Consumption and Production
- **SDG#13** Climate Action

This report will summarise SDG#12 and provides some examples of how SPRINT projects are supporting this Goal.

### **Sustainable Development Goal #12: Responsible Consumption and Production**

The definition sustainable consumption and production (SCP) from the Oslo Symposium is '*the use of services and related products, which respond to basic needs and bring a better quality of life while minimising the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardise the needs of future generations*'.

Due to the rapid growth of the global population and more demand for food, clothes and shelter, this means more exploitation of environmental and natural resources ([Rozina, 2017](#)). These have led to a rise in humanity's ecological footprint in last few decades. SDG#12 aims to ensure sustainable consumption and production patterns, and is about promoting resource and energy efficiency, sustainable infrastructures, and providing access to basic services, green and decent jobs, and a better quality of life for all.

According to [United Nations Space Affairs](#), space technologies can assist with:

- Natural resource management
- Smart Agriculture by combining Earth Observation (EO), Satellite Telecommunications and Global Navigation Satellite System (GNSS)

There are resources that humans regularly consume for a variety of purposes. Water resources are used most in agriculture, particularly for irrigation which now claims close to 70% of all fresh water for human use. It is becoming increasingly important to use water resources efficiently as only 3% of the world's water is fresh water (drinkable) and humans are using it faster than nature can replenish it. Therefore, it is necessary to maximise the efficiency of natural resources sustainably, not only the water resource, but also energy and materials should be emphasised as aspects that need to be sustainable.

### **SPRINT Case Studies**

In the previous report about [SPRINT and the SDGs](#), SDG#12: Responsible Consumption and Production appeared as the second most frequent goal from the project lists contributing to increases in net welfare gains from economic activities by reducing resource use, degradation and pollution along the whole production lifecycle, while increasing quality of life. Of the 87 projects investigated, 27 projects were assessed to contribute directly or indirectly to SDG#12.

The projects that SPRINT supports are diverse within SDG#12 but here, we highlight two: one to produce integrated ceramic fibre and metal composite to meet net-zero transport ambitions and another utilising the space-based Automatic Identification System (AIS).

## TISICS Metal Composites

TISICS is a world-leading supplier of lightweight Metal Matrix Composites (MMCs) for high performance industries. TISICS is collaborating with both the University of Surrey and the Open University on projects to develop technologies that will enable advanced lightweight tanks for spacecraft and the critical tanks needed for lightweight storage of hydrogen to approach zero emission transport. The project with the University of Surrey will develop standardised fracture mechanics testing methods, digitising a key process to demonstrate the safe use of fibre reinforced metal composites in spacecraft. Whereas the project with the Open University's Space Instrument Development (SID) group will enable TISICS to develop a system that can incorporate in-cycle control of an out-gassing manufacturing process leading to reduced cost and manufacturing energy consumption.



**FIGURE 1 DUAL FUEL VOLUME OPTIMISED TANK MODULES FOR HIGH THROUGHPUT INTEGRATION INTO SATELLITE PLATFORMS**

TISICS's innovative MMC technology offers 30% weight reduction and the potential for 70% mass reduction, enabling more efficient use of launcher capacity. Re-use of launchers will change the material performance requirements and open opportunities for fatigue tolerant materials to replace legacy technology that was designed for single use launchers. This potentially saves large amounts of energy consumption from operation and production process. Moreover, re-use of launchers prolongs the lifecycle span of the materials, which meets the targets of SDG#12.

According to the [Global Indicator Framework](#), the TISCIS project covers the following indicators:

- **12.2** By 2030, achieve the sustainable management and efficient use of natural resources
- **12.2.1** Material footprint, material footprint per capita and material footprint per GDP
- **12.5** By 2030, substantially reduce waste generation through prevention, reduction, recycling, and reuse



The outcomes of the TISCIS project could also make direct and indirect contributions to achieving other SDGs including:

- SDG#9: Industry, Innovation, and Infrastructure
- SDG#13: Climate Action

## **Redshift Associates**

Redshift Associates is a Leicestershire-based start-up company, collaborating with the University of Leicester and supported by the SPRINT business support programme to develop an innovative new service that will model and map air pollution for UK harbours and ports. This analytic solution extracts operational information on shipping from satellite remote sensing data from the marine Automatic Identification System (AIS). This enables the company to determine pollution emissions in real-time from shipping underway or in harbour. Within the project, the collaboration is also working with Belfast Harbour to evaluate pollution emissions from shipping and other industrial activity to assess the overall atmospheric emissions inventory within the Harbour Estate.

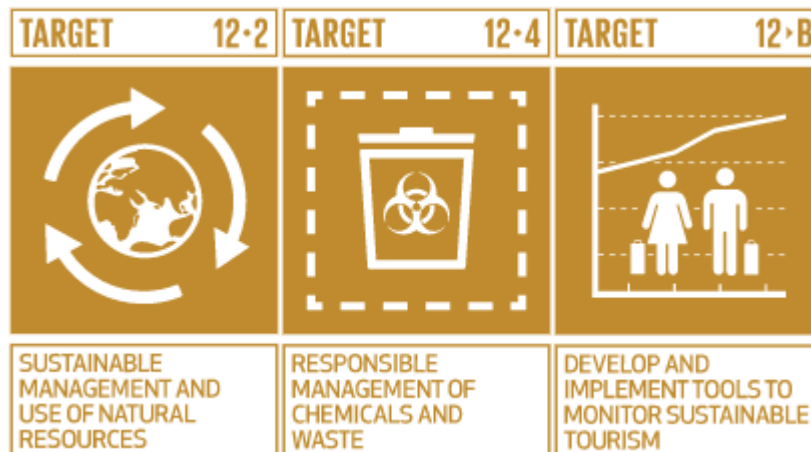


**FIGURE 2 HARBOUR SHIPPING & ESTATE ACTIVITIES**

This SPRINT project is contributing to the development of a space-enabled, commercial monitoring service for ports and harbours for maximising energy saving, pollution reduction, decarbonisation, and the transition to renewable energy options for port operations which directly influences SDG#12.

According to the [Global Indicator Framework](#), the Redshift project covers the following indicators:

- 12.2 By 2030, achieve the sustainable management and efficient use of natural resources
- 12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil to minimise their adverse impacts on human health and the environment
- 12.b Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products



The outcomes of the Redshift project could also make direct and indirect contributions to achieving other SDGs including:

- Goal 3: Good Health and Well-being
- Goal 9: Industry, Innovation, and Infrastructure
- Goal 11: Sustainable Cities and Communities
- Goal 13: Climate Action

## Conclusion

The United Nations' Sustainable Development Goals are to achieve economic growth and sustainable development around the world. In particular, sustainable consumption and production patterns can be achievable through these SPRINT projects, with the SDG#12 objectives partially achieved in a sustainable manner, especially the fuel consumption and life cycle of material. These SPRINT projects support the foundation of efforts to achieve the SDG#12 objectives which is the efficient management of our shared natural resources and the way we dispose of toxic waste and pollutants.

It is in the interest of business to find new solutions that enable sustainable consumption and production patterns, and a better understanding of environmental and social impacts of products

and services. It is therefore essential to encourage the potential capabilities of Small-Medium size Enterprises (SMEs) to expand their influences through collaborations and partnerships such as the SPRINT programme.