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| **Local energy harvest for remote sensing** |
| **Project Outline** |
| One of the biggest factors limiting the wide scale uptake of remote monitoring of reliance on batteries and costs required for their replacement. This project will explore, develop and trial novel concepts for the development of local power scavenging technology to overcome this. This would unlock the potential for remote sensing of distributed infrastructure that is essential if we are to understand and make the best use of ageing infrastructure in meeting the combined pressures of climate change, population growth and the need to protect the environment.  The application of existing power scavenging technologies have been proven inappropriate, such a solar or wind due to cost, vandalism etc. or use of vibration harvesting from technology used in the London underground due to poor characterisation of the vibration source. The leading concept to be explore is the oscillating energy from pressure transients – the investigators have an internationally unique data set to drive this assessment. Other potential solutions could be found in the use of flow rate driven oscillating fluid devices. |
| **Primary supervisor** |
| Joby Boxall, Civil Eng, Theme 2, 3 and Hub. Expertise in hydraulics and potable water supply  j.b.boxall@Sheffield.ac.uk |
| **Other members of the supervisory** |
| Richard Collins, Civil Eng, Theme 3. Expertise in programming and systems analysis. |
| **how the proposed project adds value to TWENTY65** |
| An overarching theme of Twenty65 is better knowledge of systems and their performance. This project could unlock on the fundamental barriers to this. The solutions could be applicable to distributed fixed sensors as currently deployed or to mobile autonomous futures such as being envisioned in theme 3. |
| **Suggest titles and journals for two 4\* papers that you expect to arise from the project** |
| Power spectrum analysis of water distribution system transients – damage and energy potential.  Next generation power scavenging remote sensors. |