



Green Maintenance: Sustaining the Rail Industry

- 🚂 The running gear on trains are heavy steel components that will wear out – but when



- 🚂 Wheelsets and bearings are being disposed of - on a timed schedule, not on-condition

🚂 1.8 tonnes of CO₂ is released for every 1 tonne of steel produced





Condition Maintenance



By continuously monitoring the condition of the components there is **no waste** – and no surprises!

A wireless (radio) system needs **no cabling**, ideal for this application

Power obtained from **Vibration Energy Harvesting** – i.e. the very parameter being measured! No chemicals

Wheel

Sensor



Showing sensor node bolted to train (OB right)



Results

Showing double outer race with 95mm Rolling Contact Fatigue damage on inboard raceway



Collaborative Research

🚂 Wheel axle sensors are correctly *identifying* failing bearings

🚂 The current research aims to correlate extent of damage to measured vibration

🚂 Opportunity to understand the rate, mechanism and **propagation of the failures**



Scale: 0.2mm/div

