Lasers keep greenhouse gases on the radar

Science & Technology Facilities Council

LiDAR telescope measures greenhouse gas concentrations in the atmosphere. Image Credit: Professor John Moncrieff

Whether its carbon dioxide (CO2) emissions from power stations, methane (CH4) leaks from natural gas wells or carbon credits, greenhouse gases (GHGs) keep hitting the headlines.

However they remain difficult to accurately measure, which makes the fight against man made climate change (which is caused by GHGs) more difficult.

University of Edinburgh Scientists have developed a laser based radar (LiDAR) system to measure the amount and location of GHGs in the atmosphere using STFC telescope technology and innovations Partnership Scheme (IPS) funding.

The LiDAR system could measure the quantity of GHGs given off at sources (factories, power stations, etc.) and taken up at sinks (forests, grassland etc.).Therefore the project has gained support from the European Union, the Natural Environment Research Council and Scottish Enterprise.

Emission monitoring could potentially improve the accuracy of carbon credit trading (where businesses buy permits to emit a limited amount of GHGs, and are fined if they exceed the limit).

The European carbon credit market was worth €56 billion in 2012 alone, and covers over 11,000 installations, therefore there is a large market for detectors such as the LiDAR system as businesses try to ensure they don't have to buy carbon credits for or pay fines on emissions they didn't produce.

Better understanding of where GHGs are being emitted and absorbed could also help reduce the amount of GHGs in the atmosphere and combat man made climate change.

> **With help from the IPS Scheme, our Carbon Telescope promises to be a game-changer in studying climate change's driving forces.**
>
> Professor John Moncrieff, University of Edinburgh.