right solutions.
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Climate Change and Sustainability

Impacts and Innovations in Contaminated Land

A Laboratory Perspective

www.mentimeter.com

Code: 4552 5209

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OUR **VISION**

To be the global leader in the discipline of scientific analysis in pursuit of a better world for all.

OUR **MISSION**

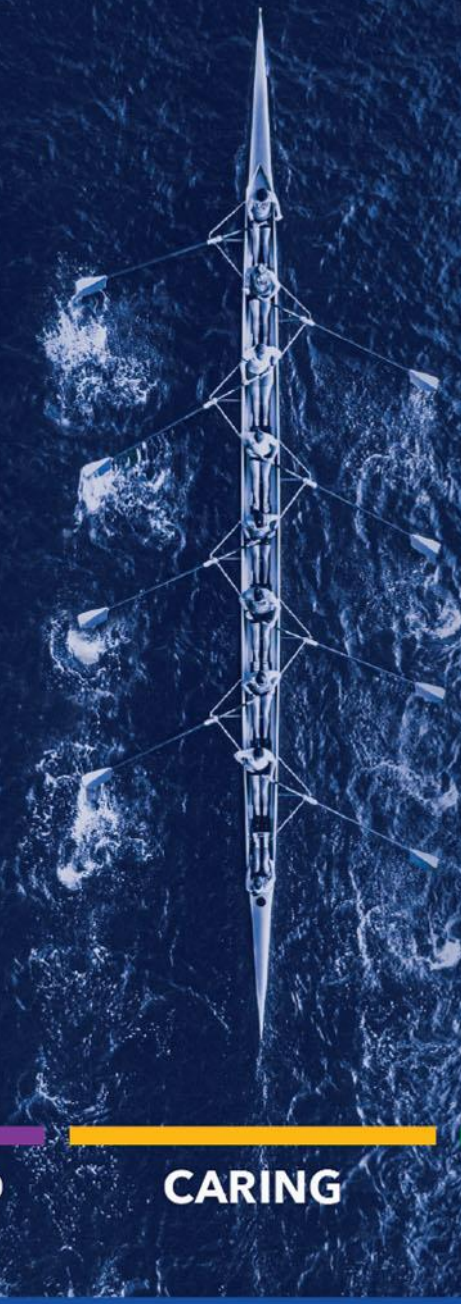
ALS is using the power of testing to solve complex challenges. With a passion for science, we serve clients with data-driven insights for a safer and healthier world.

OUR **PURPOSE**

SCIENCE. ASSURANCE. SUSTAINABILITY.

OUR **VALUES**

SAFE | RESILIENT | CURIOUS | COMMITTED | CARING | HONEST



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Our global scale

65+
Countries

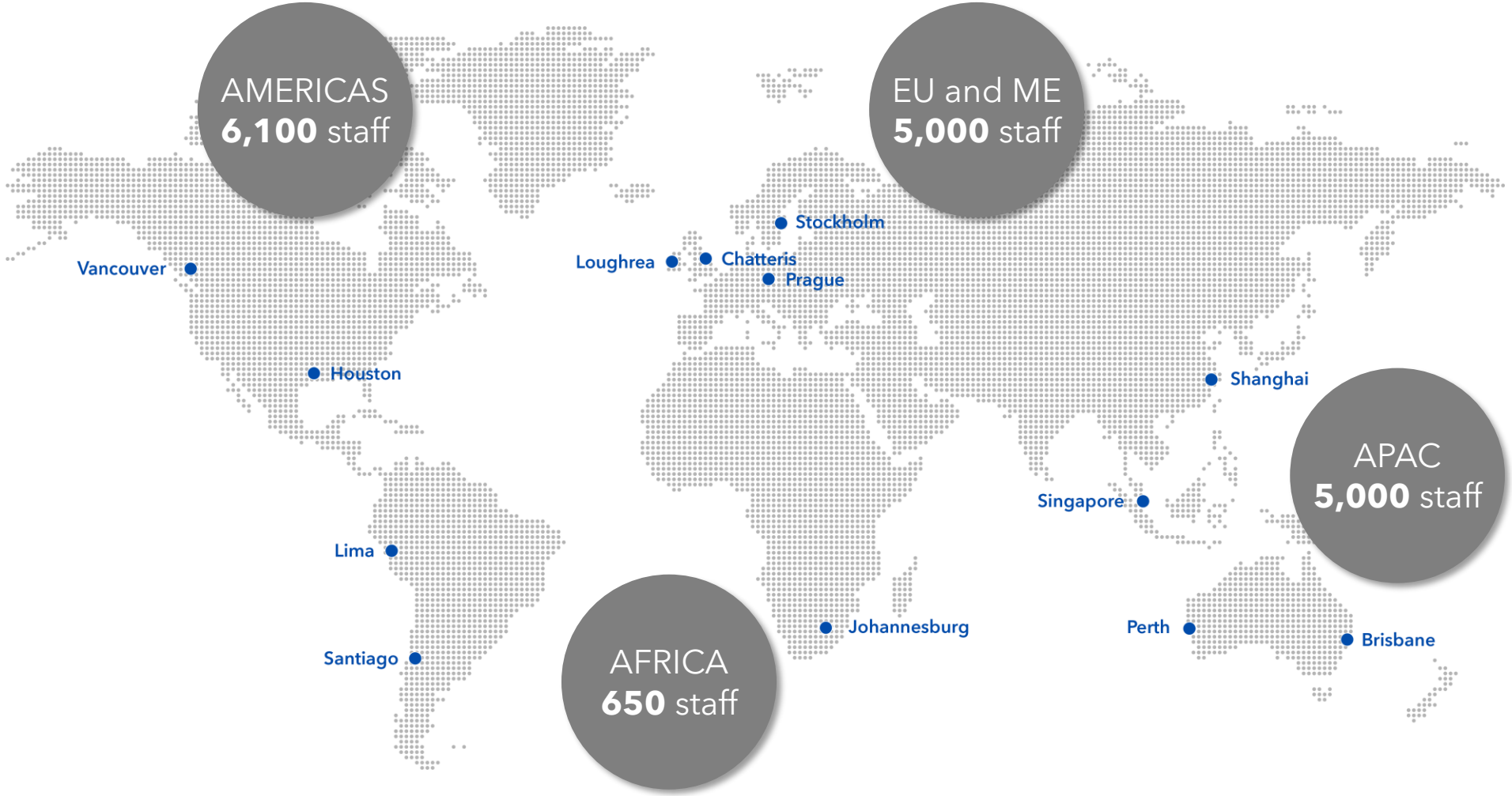
350+
Offices

40+
Years

17,000+
Staff Worldwide

40M+/yr.
Samples Processed

AU$1.8B
Global Revenue



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Our ESG Vision

People

Deliver world-class health and safety outcomes, and attract a diverse, capable and engaged workforce.

Society

Make a positive contribution to our local communities.

Environment

Minimise our environmental footprint and build our resilience to climate-related impacts.

Governance

Operate ethically and responsibly to deliver sustainable outcomes for our stakeholders.

Our ESG Focus Area for this presentation

Environment

Climate change
- CO_2 & Green House Gas emissions
- Task Force Climate Related Financial Disclosures (TCFD)
- Efficient buildings, plant & equipment

Waste reduction
- Resource conservation
- Regulated waste

Operational environmental performance
- Management of adverse environmental emissions
- Efficient operations

Water conservation
- Managing a scarce resource

TOWARDS CLIMATE NEUTRAL OPERATIONS

Environment – Some of our achievements so far

- Corporate Environmental Management System certified to ISO 14001 by DNV
- 8% reduction in energy intensity since 2018
- 27% reduction in carbon emission intensity related to electricity consumption since 2018 (Scope 2)
- 18.6% reduction in combined Scope 1 and 2 greenhouse gas emissions (UK)
- Strengthened climate change reporting using Task Force on Climate-related Financial Disclosures (TCFD) framework
- Green Building Standard adopted for all new builds and fit-outs
- Over 70% of top 50 energy consuming sites have adopted LED lighting

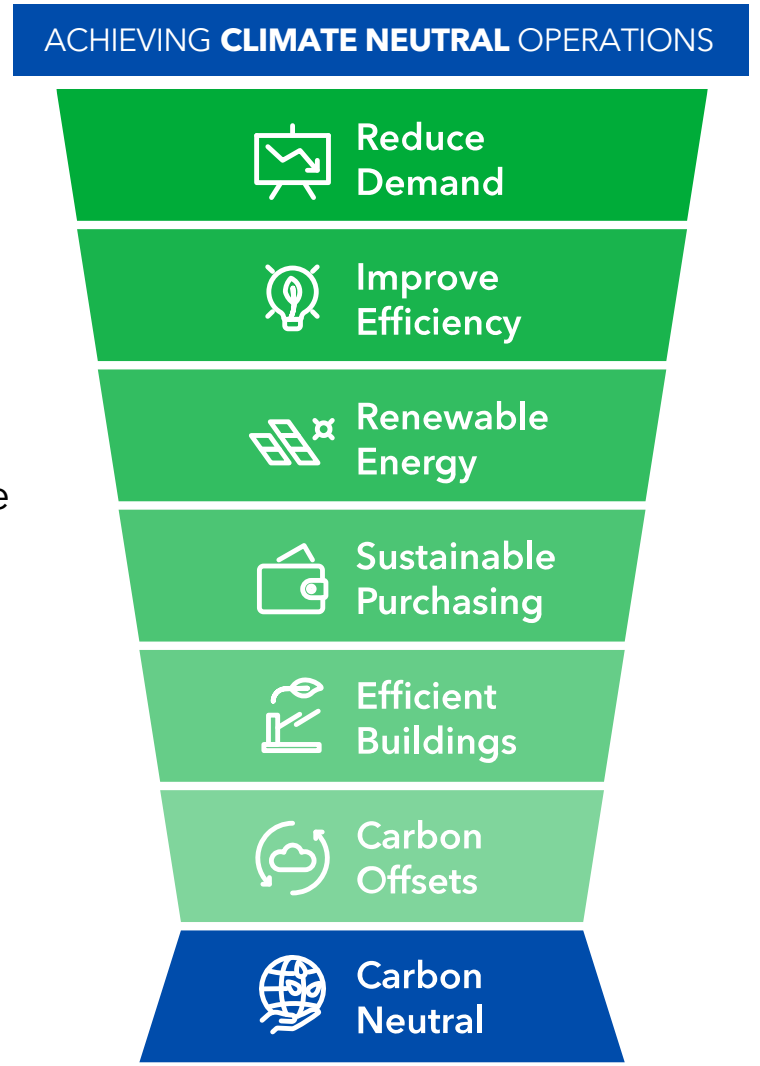
Environment – Our Future Targets

FY23 Targets

- Achieve carbon neutrality in FY23 on scope 1 and 2 emissions
- Achieve a 6% reduction in carbon intensity*
- >90% renewable electricity across ALS global operations
- During FY23, develop a roadmap to achieve net zero carbon emissions

Longer Term Targets

- Achieve 40% reduction in carbon intensity* for scope 1 & 2 GHGs by 2030
- 30% reduction on the average CO_2 emissions from our total motor vehicle fleet by 2027
- Full alignment with Task Force on Climate-related Financial Disclosures (TCFD) by 2027
- Continue waste reduction programs for most environmentally significant wastes in each business stream
- Invest in solar energy installations, LED lighting upgrades and sustainable building standards



* Carbon Intensity ratio based on FY2020 revenue baseline

Carbon Reporting

Scope 1 emissions

Direct emissions from sources that an organisation owns or controls

e.g, burning diesel fuel in a fleet of vehicles

Scope 2 emissions

Emissions caused indirectly through the purchased energy

e.g, any electricity we use on our laboratory sites

Reportable

Scope 3 emissions

Emissions that are not produced by the company itself, but by those that it's indirectly responsible for

e.g. Products bought and disposed of from suppliers

Not currently reportable

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UK performance in reducing scope 1 & 2 emissions over the last few years

UK Environmental	Total kWh	Total TCO_2e	Total TCO_2e/$1m AUS
FY20	12,457,808	3021.5	138.08
FY21	11,604,808 (-6.9%)	2736.7 (-9.4%)	42.85 (-28%)
FY22	11,674,286 (+0.6%)	2517.2 (-8.0%)	33.66 (-21.5%)

UK Food & Pharmaceutical	Total kWh	Total TCO_2e	Total TCO_2e/$1m AUS
FY20	9,452,989	2370.3	31.10
FY21	8,507,063 (-10%)	1,988.5 (-16.1%)	29.96 (-3.7%)
FY22	8,013,579 (-5.8%)	1,793 (-9.8%)	24.38 (-18.6%)

UK Enviro, F&P	Total kWh	Total TCO_2e	Total TCO_2e/$1m AUS
FY20	21,910,797	5,391.8	37.32
FY21	20,111,871 (-8.21%)	4,725.2 (-12.36%)	36.28 (-3.31%)
FY22	19,687,865 (-2.1%)	4310.2 (-8.78%)	29.05 (-19.93%)

- Bracketed figures are difference on previous year
- Total TCO_2e have had a conversion rate applied
- Total TCO_2e/$1m AUS is a ratio based on revenue

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Employee engagement - Action Leading to Sustainability

- ALS programme “Action Leading to Sustainability” rolled out
- Monthly energy checklists are completed on all sites
- Completed by different employees on each occasion
- Data collated and remedial actions identified
- By the end of the first year there were over 60 individual actions
- Toolbox talks on sustainability and energy awareness
- Regular communication on performance in team briefs and on noticeboards

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Cold Store Size Reduction

- ALS Hawarden uses around 1,664,000 kWh electricity per year, which is equivalent to 388 TCO_2
- The largest energy consumer at Hawarden is the main coldstore which uses 149,000 kWh per year
- The cold store is 17.5m x 11m x 8m and holds up to 10,000 crates
- 37% crates were older than 2 months, 26% had no disposal date at all
- 42% of crates contained <5 samples
- Standard storage terms are 30 days after report but some clients get longer. Average is 50 days
- Majority of contaminant holding times are 14 days
- In last 6 months, data checks were raised on 782 out of 278,182. That's 0.28% of all samples.
- 68% of data checks were raised within 10 days, 24.7% between 10 and 30 days and 7.7% after 30 days **<0.1%**

Reduce	Combine	Review	Manage
Reduce standard storage time to 15 days after final report issued.	Combine bottles from different SDG's into individual crates.	Review sample store temperature and keep it around 5°C, instead 3°C as we do now.	Better manage coldstore crates to ensure disposal dates are adhered to.

Cold Store Size Reduction - Benefits

- Use of new refrigerant can achieve a 65% lower GWP* compared to the current one.
- Modern cooling units are better able to manage temperature.
- Reduction in energy consumption from 164,065 kWh to 22,981 kWh per year
- Reduction in coldstore carbon footprint from 38.2 to 5.4 TCO_2e per year (86% reduction)

*Global warming potential (GWP) is a measure of the relative global warming effects of different gases.

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Cold Store Size Reduction – The Risk

- If a client needs us to re-test a sample 15 days after reporting, it'll be gone!

Question:

Should our clients be prepared to change their practices help facilitate this change?

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Energy Reduction Initiatives

Voltage Optimisation

- UK electrical equipment works at 220V
- The Chatteris site average input voltage is 241.1V
- Excess voltage is rejected and returned to the Grid
- Estimated 50,000 Kg CO_2e carbon emission reduction per annum
- VO system also installed in Ely - c12,000 Kg CO_2e reduction per annum

Energy Reduction Initiatives

Triple Switchover Pump System installed in Coventry

- A new pump system installed for moving cold water around the building.
- Energy saving due to the pumps not running 24/7, the pumps only run when the system needs boosting.

Energy Reduction Initiatives

New Microbiology incubator at Coventry

- A large walk-in 22°C incubator has replaced the 9 old ones.
- Energy saving is estimated at 673 kWh or 130 Kg CO_2e per year.
- Quality benefits of temperature control, i.e its much easier to control the temperature of one incubator instead of nine!

Energy Reduction Initiatives

High efficiency boilers at Coventry

- The bank of boilers providing heating to most of the Coventry site have been replaced
- Gas usage at the site reduced by 35-40%
- Coventry consumption for 2021-22 was 1.2million kWh of gas and we can be optimistic of taking a huge chunk out of that this coming winter

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Energy Reduction Initiatives

Heat transfer

- 350 °C heat generated by Wakefield GC instrument ovens was previously vented directly into the lab, making it very hot, especially in summer
- This was uncomfortable for the staff and caused slow running of the instruments
- Air conditioning was required to keep the area at a tolerable temperature
- Waste heat is now drawn out of the lab
- In summer excess heat is vented outside. In winter we redirect this heat into the sample reception area.

Heat recovery

- Heat recovery coils have been fitted to the extraction system at the Chatteris site.
- The system captures any residual heat from the extracted air and it's fed back in to the air handling system that balances the air temperature in the lab.

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Water Saving Initiatives

- Waterless urinals are being installed across all our sites as an alternative to flushable water urinals
- Estimations of water saved at each site are around 1000 m³ each year
- A water saving of 1000 m³ per year of water equates to a carbon reduction of 175 Kg of CO_2 emissions

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Water Saving Initiatives

Rainwater Harvesting

- Rain water from the roof at Chatteris is captured and stored in a 25,000 litre underground tank
- Captured water is pumped to the plant room where it is processed for use in laboratory glass washers
- The six washers that are supplied use 75 litres of water per cycle and are in operation 6 times a day on average
- Providing the UK weather co-operates, the site can reduce mains water usage by over 840,000 litres per annum
- A water saving of 840,000 litres per year equates to a carbon reduction of 147 Kg of CO_2 emissions

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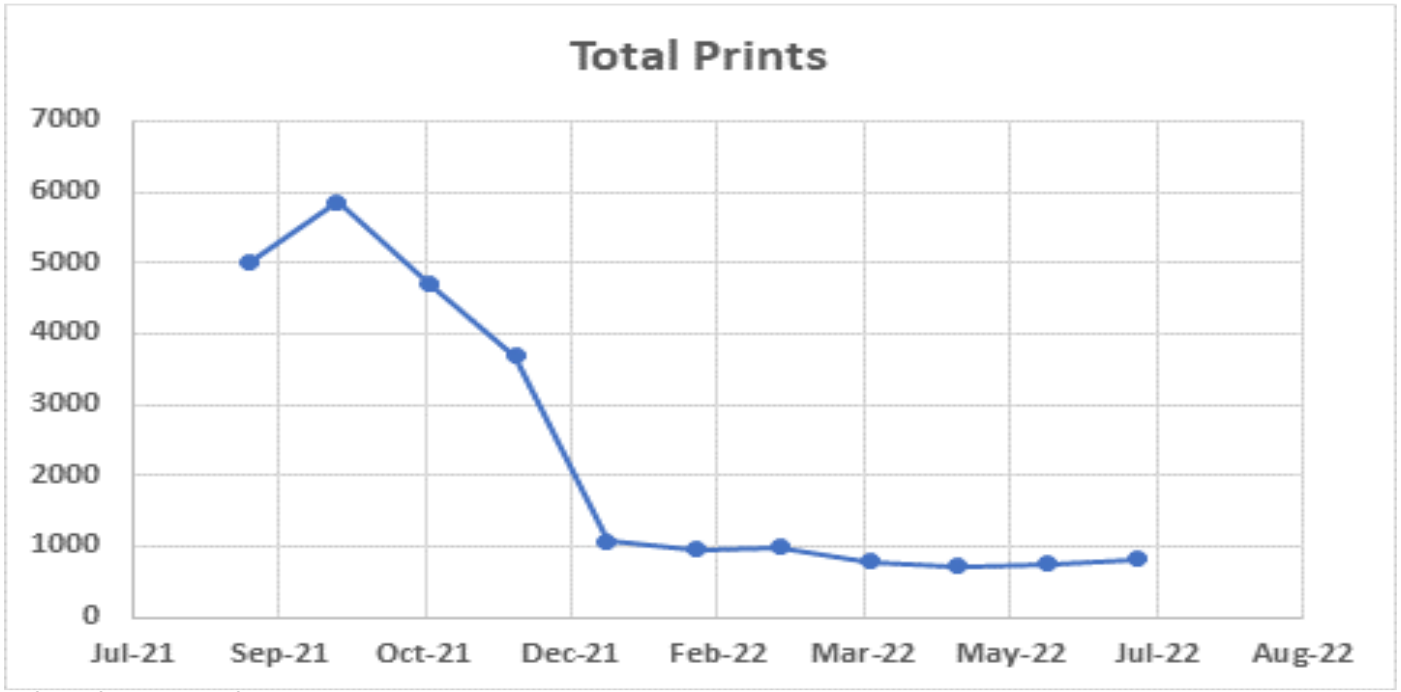
Paper reduction in the finance team

The finance teams have reduced their paper usage by going digital.

- Invoices are now paperless
- Signature approvals managed via Docusign
- Total prints reduced from 6000 to 1000, as shown in the graph.



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Recycling

- ALS work closely with suppliers in an attempt to recycle as much plastic, glass and packaging material as possible

- With just one of our major consumables suppliers, each year we recycle in excess of…
  - 40,000 cardboard boxes
  - 20,000 2.5 litre glass bottles
  - 8,000 5 litre plastic bottles

Recycling Initiatives in Hawarden

- Aluminium trays are crushed into ingots on site sold.
- Since starting this initiative we have collected 38kg of aluminium and the sale proceeds are donated to a good cause.

- 25t of uncontaminated glass waste diverted from landfill to recycling
- 33.6t of glass recycled per year compared with previous figure of 8.6t
- Equivalent saving of 10 t of CO_2 per year

- Introduction of non-toxic LED lights in crypto microscopes
- Mercury bulbs have been phased out for non-toxic LED lights
- This reduces energy costs, and eliminates the production of hazardous waste.

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Miniaturisation Projects

- Increased sensitivity of new instruments enables lower sample volumes
- lower volumes allow automation of the sample prep stage
- Machines less prone to human error, therefore:
  - less repeated work
  - fewer quality investigations
  - improved productivity
- Sample bottles have been reduced from 250ml to 2x40ml vials
  Therefore:
  - Less glass waste
  - Reduced transportation costs
  - Reduced storage costs
  - Much less trade effluent waste going down the sewer
  - Less extraction solvent required, therefore reduction in the amount of hazardous waste produced

Agilent GCMS for PAH/SVOCs

New sample preparation automater

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New Sustainable Eco boxes to replace plastic tubs

- Biodegradable
- 100% compostable
- Waterproof polylactic acid (PLA) lining
- Container has passed all QC testing
- 60,000 plastic tubs could be removed from circulation
- Reduce Plastic waste by up to 2,800kg per year

Change to Recycled Cool Bags

- By replacing plastic cool boxes with fabric cool bags and using cardboard inserts instead of bubble wrap bags for internal packaging, ALS Hawarden has **removed 23.5T of plastic** from our operations.

Measuring Scope 3 emission reductions

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Removing Plastics from the process chain

- Metaldehyde is an organic pesticide (banned in March 2022) used to kill slugs and snails
- Method re-written and validated to remove unneeded filtration from the prep stage
- 16,500 syringes and filters removed from the process

- This method is to test for Phosphorous, a key nutrient in soils.
- The three-stage process - shaking, filtering and a reaction
- Two out of the three stages now use glass rather than plastic
- Now validation is complete we estimate that we will use 39,500 fewer plastic pots per year

- We test for a broad range of water pollutants at our potable water lab in Wakefield.
- Quite simply, the single use plastic petri dishes in this lab have been replaced by washable glass ones.

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Scope 3 emission calculations

- 16,500 Syringes/filters per year removed from metaldehyde method at Wakefield
- 39,500 fewer single use plastic Maff P filtering pots per year in Hawarden
- 365 thamno single use plastic petri dishes removed per year in Wakefield

	Counts	Weight	Material	Processing	Emission factor*	Kg CO_2e
Syringe	16,500	6.66	Polypropylene	Blow Moulding	2.75	302
Filter	16,500	3	PMMA	Injection Moulding	15.15	750
Maff P	39,500	10.7	Polypropylene	Blow Moulding	2.75	1,162
Petri dish	365	5	LDPE	Injection Moulding	2.87	5
					Total	**2,220**

- This initiative saves 2.2 Tonnes CO_2 per year. That's 0.1% of our Scope 1 and 2 emissions in UK Enviro.

*Emission factors from EcoInvent 3.8 – Subscriber database. Including assessment of transport impact.

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Should we invest in an Electric Fleet?

- Electric vans have zero emissions and a lower carbon cost
- Cheaper to run
- Issues with range
- Lack of charging stations
- Can't get electric refrigerated vans

- Energy needed to power a van = ~3 miles per kWh
- Total miles FY22 = 2,682,797
- Total energy = 894,266 kWh
- Electricity conversion factor = 0.19338 Kg CO_2e
- Estimated CO_2e emissions for Electric van = **172,933 Kg CO_2e**
- That's 84% lower than Diesel

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HVO100 Biofuel

- Hydrotreated vegetable oil (HVO) is a paraffinic diesel fuel that can be used as a direct replacement for diesel.
- HVO is synthesised from 100% renewable raw materials such as vegetable oils, animal oils and fats, which reduces net CO_2 greenhouse gas emissions by as much as 90%.
- Already widely used in some European countries such as Sweden and Denmark.
- ALS Denmark has a current target of 20% HVO100 usage in their fleet.
- HVO100 not widely available in the UK …yet.

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HVO100 - Some calculations

Diesel used in UK FY22 = 429,040 litres

Diesel Conversion factor is 2.51233 L to Kg CO_2e
HVO100 Conversion factor is 0.35 L to Kg CO_2e

Annual Carbon emissions for Diesel = 1,077,890 Kg CO_2e
Annual Carbon emissions for HVO100 = **150,164 Kg CO_2e** That's an 86% reduction!

Cost of Diesel (Oct 2022) = £1.48 per litre -> £634,979
Cost of HVO100 (Oct 2022) = £2.05 per litre -> £879,532

Annual cost difference = £244,533* -> 39% increase
*Assumes similar efficiency

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Some questions

1. Do you believe that this kind of emission reduction is important to you and your clients?

2. Do you believe that this would be considered when choosing laboratory provider for a specific project?

3. Do you believe that you would be able to accept/get your client to accept a surcharge of, say, 1% to cover the cost of this emission reduction?

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