Cheltenham's Climate Impact Assessment Tool

- In partnership with West Oxfordshire DC

Laura Tapping
Climate Emergency Programme Lead

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Agenda

- Aims of the tool & why it is needed
- Demonstration & examples
- Developing & embedding
- Where are we now
- Looking ahead

The tool should:

- help ensure projects and policies are **aligned to Council commitments to climate action,** as well as other council priorities.

- assess **social and environmental** impacts, under the assumption that financials are often automatically considered

- be completed as early as possible to highlight **climate positive areas and areas for improvement.**

- add weight to the environmental **implications in the Cabinet report.**

Why do we need an Impact Assessment Tool?

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20 CHELT ZERO 30

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CHELTENHAM BOROUGH COUNCIL'S

Climate Emergency Action Plan

Pathway to Net Zero

Our 2030 action framework to become a net zero Council and Borough

Follow CBC cheltenham.gov.uk

Before the Tool

- Finance first approach
- Social & Environmental implications considered last minute as a tick box exercise
- Climate impacts a concern for the Climate Team

Demonstration

Pilots

Ice Rink 2022: Diesel Generators

Thoughts:

- **Positives**: The ice rink provides ample opportunities for the community including health, education, cultural experience.
- **Where can we improve?** More accessible options, consider the impact of lighting on nature
- **Where must we look for alternatives?** The use of diesel generators, providing more sustainable transport options for visitors

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Pilots

Feedback

- Tool gives structure / framework to different aspects for consideration and makes climate questions more tangible by breaking them down into different elements
- Dashboard visual of Red/Amber/Green/Grey – helps to focus the mind on what the key impacts are

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The tool in decision making

- The tool should be used on any project/proposal that:
  - comes forward for approval
  - is presented to cabinet for a decision
- A number of **red** sections signifies that a project or policy will have severely negative impacts in the indicated areas. This may be cause for concern, but at this stage will not be reason enough to reject a proposal.
- To encourage transparent use of the tool, the project manager should take one of three routes, and should add this to any proposal or cabinet report:

1. Change
2. Mitigate
3. Justify

Developing the tool

- **Research** - Cornwall's Decision Wheel, Doughnut Economics
- **Focus groups** – value feedback during design phase
  - Adding in social elements – equalities impact assessment not used as well as it should be. Clear linkages between environment and social issues.
- **Excel design** – Lily Paulson, WODC

Feedback from focus group using Jamboard

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Embedding to tool

- Pitching to Senior Leaders
- 6 month pilot agreed by Cabinet
- Service managers sessions
- January demonstration day & training
- Part of Project Initiation process

Why it works for Cheltenham

- Allows for lots of unknowns
- Assumes limited climate knowledge
  - universal & accessible
- Simple and consistent structure to questions
- Visual output - allows for informed decision making at Cabinet/Council
- Developed in-house with officer input – helping with roll-out

- Social & Environmental implications considered at project design stage - by project mgrs.
- Greater awareness of wider impacts
- New climate conversations!!

Areas for improvement

- Subjectivity
- Relies on honesty and best guesses
- Excel – susceptible to format errors
- Requires more capacity to review and provide feedback, and monitor improvements

Next Steps

- Considering a County-wide approach
- Move to an online format
- Further embed into the project initiation phase
- Using at pre-procurement stage

Thank you

Laura Tapping

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JOE ELLWOOD – PRODUCT MARKETING SPECIALIST

EV charging considerations for Local Authorities

Why, what and where?

ABB and EV charging

ABB E-mobility:
The world leader in EV charging solutions

A pioneer of the green mobility revolution

$256 mn
Total investment by ABB from 2017 to 2021[1]

$323 mn
2021 revenue

61%
2017-2021 revenue CAGR

>800k
AC chargers sold

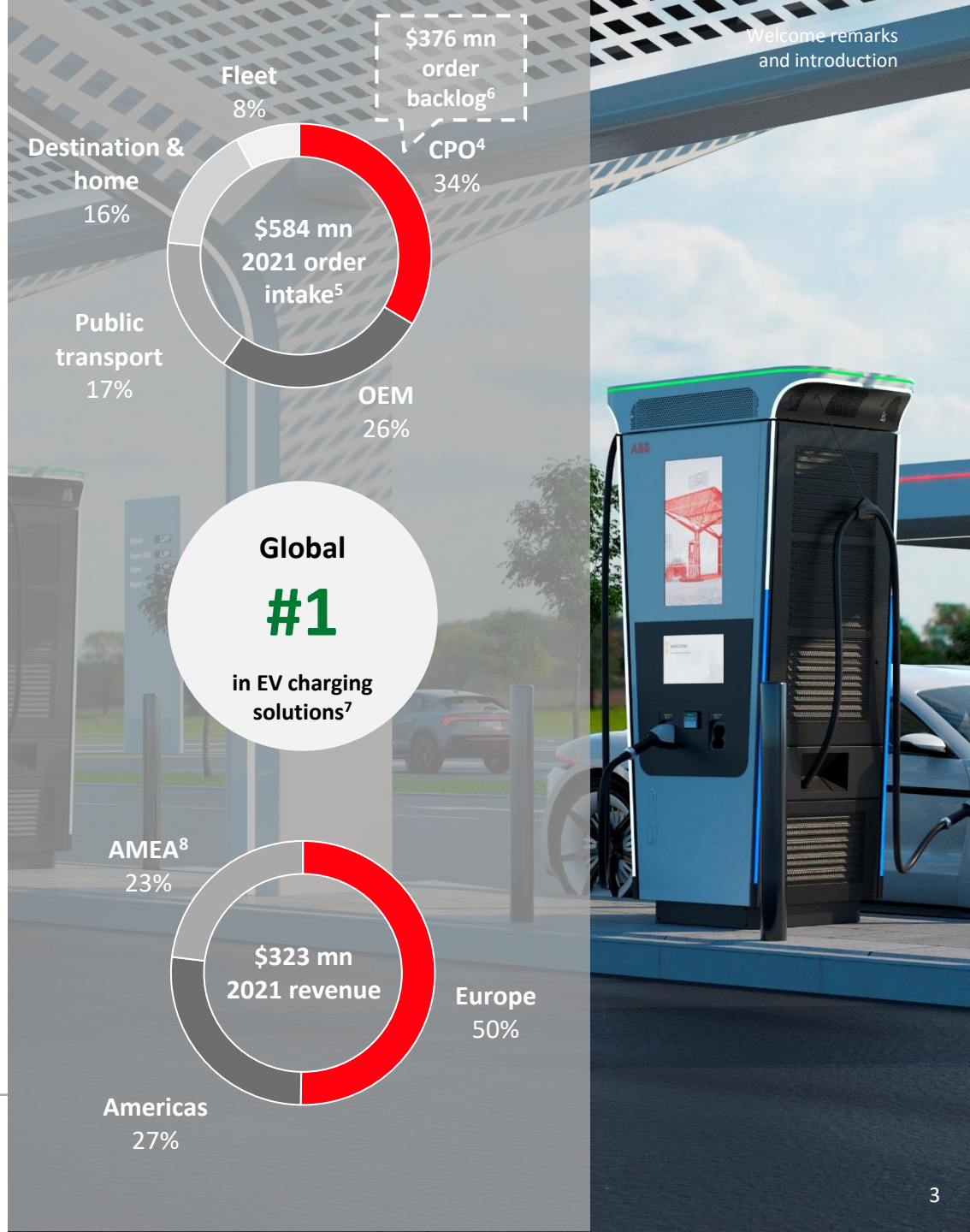
>40k
DC chargers sold

>350
Granted patents

>85
Markets served[2]

~1,000
Employees

>350
R&D experts[3]



Source: Company information
Note: Financial information is in draft form and is subject to completion and amendment; unless specified, figures are as of today

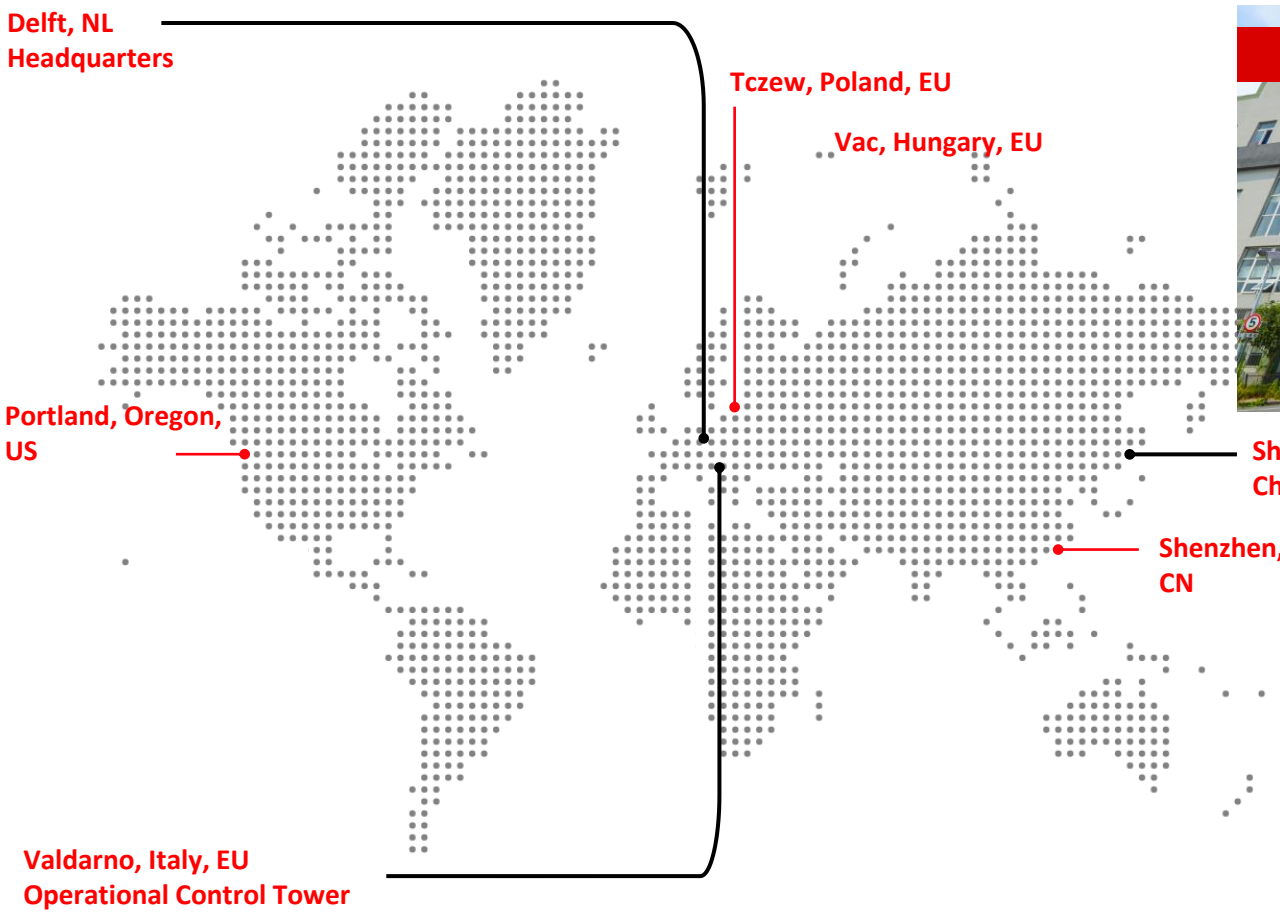
1. Total investment includes R&D expenses, capital expenditure, M&A and equity investments
2. Including via MDA (Master Distribution Agreement) with ABB Group
3. Includes contractors
4. Charge Point Operator
5. Order intake represents the order value of contracts awarded during the respective accounting period to design, engineer, manufacture and/or provide EV charging solutions, services and software; split excludes unassigned segments and sales via ABB given no visibility on end-market ($118 mn)
6. Order backlog for EV charging solutions, services and software represents the undiscounted value of future revenues that the Group expects to generate from our orders at any point in time; as of 31 December 2021
7. Based on ABB management assessment; Roland Berger conducted revenue, footprint and product breadth analysis
8. Asia, Middle East, Africa

ABB E-mobility solutions business

Positioned well for global growth

E-mobility Innovation Lab

Global footprint



Chargedot

ABB E-mobility Center of Excellence

EV fast charging and global standardization

ABB leading in major developments this decade

2010
Founding of CHAdeMO
ABB was involved from the start

2010
Launch Terra 51
50 kW CHAdeMO charger

2012
Founding of CCS alliance
ABB involved from the start, basis for IEC standard

2013
Launch CCS & multi-standard Terra 53
CCS + CHAdeMO + AC

2013-2015
Launch global variants Terra 53
China, USA, APAC

2016
First eBus chargers
Global partnerships with bus OEMs

2018
First eTruck chargers
Global partnerships with Truck OEMs

2019
DC Wallbox
24kWp, 920V

2020
Terra AC
7.4 - 22kW

2021
MCS
4MW

Pilots — **CHAdeMO** — **First EV's** — **CCS alliance** — **IEC 61851-23** — **Multi-standard** — **Global EV spread** — **E-bus** — **OppCharge** — **Higher power** — **High Voltage** — **Smart AC** — **Near future**

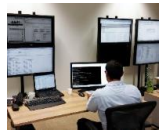
2010
First EU 50 kW charger
Proprietary standard, no consumer EV's available

2010
First EV's with DC charging
Nissan Leaf & Mitsubishi iMieV

2012
First demo of CCS charging
ABB & CCS alliance at EVS26 Los Angeles USA

2012 - 2013
First nationwide DC networks
ABB in Estonia, Denmark Netherlands

2012 >
ABB leading Connectivity & uptime
ABB has industry leading uptime by remote mnmnt



2014 >
DC networks spread globally
Europe, USA, Asia

2017
Launch of high power for cars
150-350kW charging for next generation EV's

2018
Gen2 charge post and Terra 54HV
Next steps in High Voltage charging

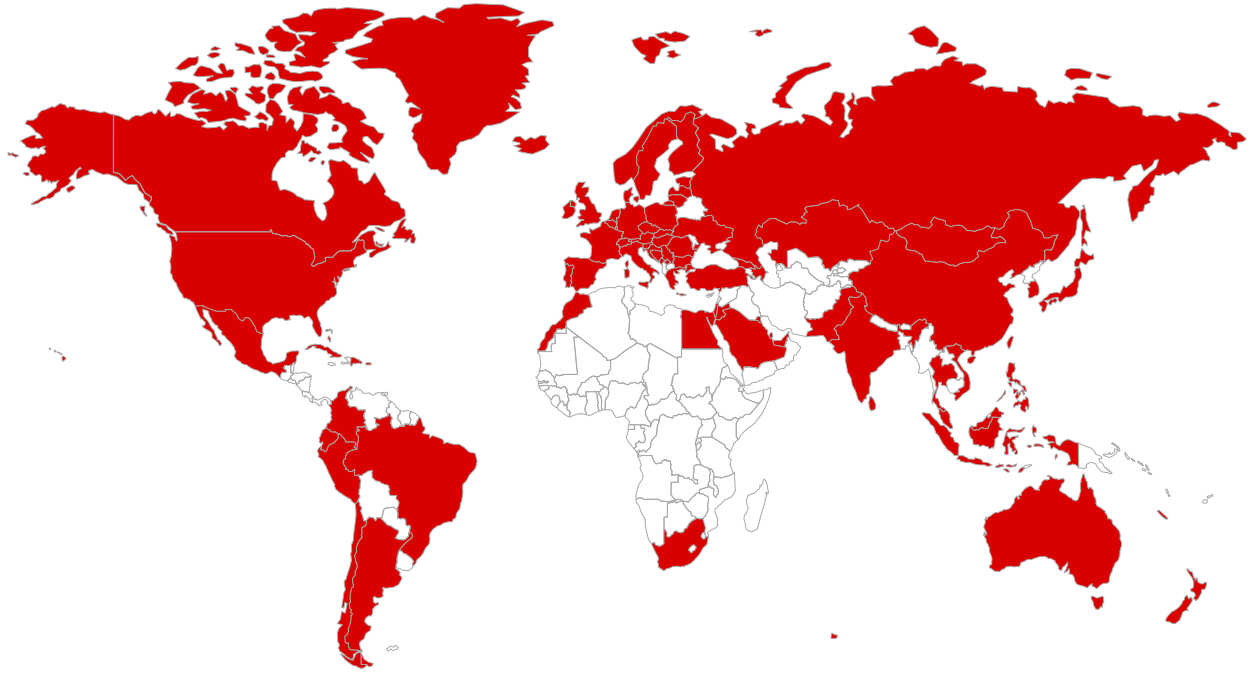
2020
Terra 184(HC), Terra 124(HC), Terra 94
Dual DC charging in Terra 184 and Terra 124. Up to 300A.

ABB DC fast charge installations

Proven technology in the field since May 2010, now in 85+ countries

Actual

Argentina, Australia, Austria, Azerbaijan, Bahamas, Barbados, Belgium, Bosnia Herzegovina, Brazil, Bulgaria, Canada, China, Chile, Colombia, Croatia, Cuba, Czech, Denmark, Dominican Republic, Ecuador, Egypt, Estonia, Faroe Islands, Finland, France, Germany, Georgia, Greece, Greenland, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Kosovo, Kuwait, Latvia, Liechtenstein, Lithuania, Luxembourg, Malaysia, Mexico, Monaco, Mongolia, Montenegro, Morocco, The Netherlands, New Zealand, Norway, Oman, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Qatar, Reunion Island, Romania, Russia, Rwanda, Saudi Arabia, Serbia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, Ukraine, United Kingdom, USA, and Vietnam



Total more than 30,000 pcs DC fast charging units sold (≥10 kW)

ABB is global charging partner for Car, Bus and Truck OEMs

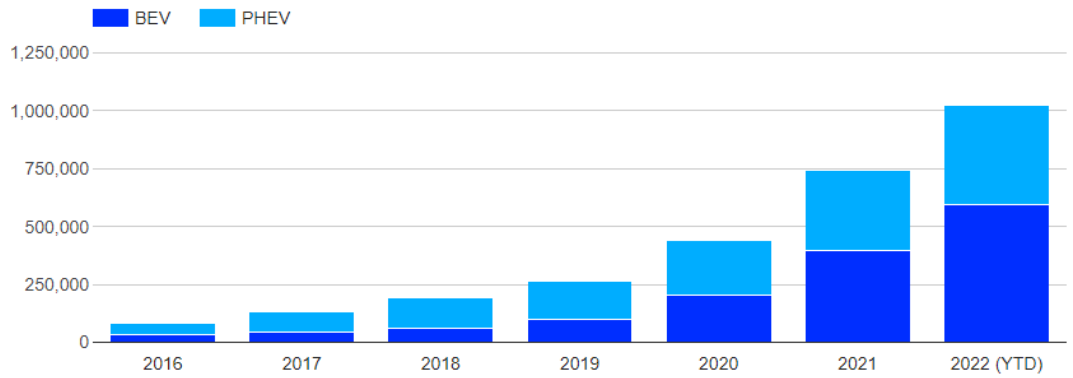
Strong presence in China, USA and Europe

UK outlook – why?

E Mobility – Where are we now and where are we headed?

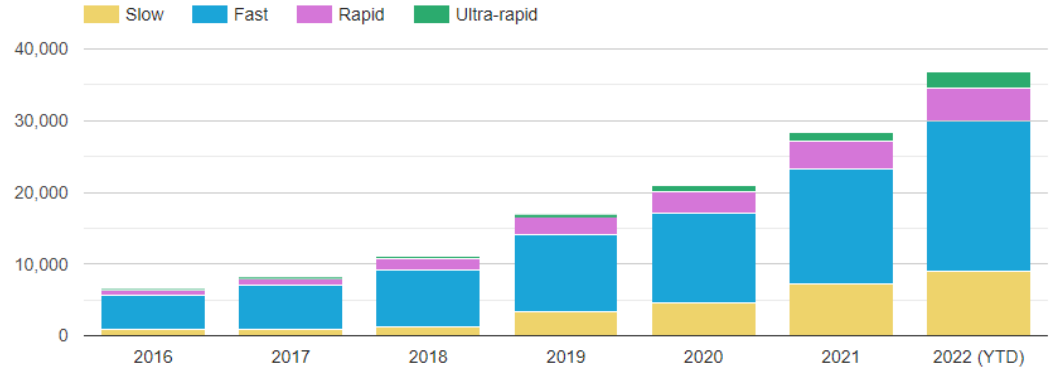
EV market

Cumulative number of plug-in cars registered in the UK (2016 to date)



Source: SMMT, October 2022

Number of public UK charging points by speed (2016 to date)



Source: Zap-Map database. Updated: 30th November 2022

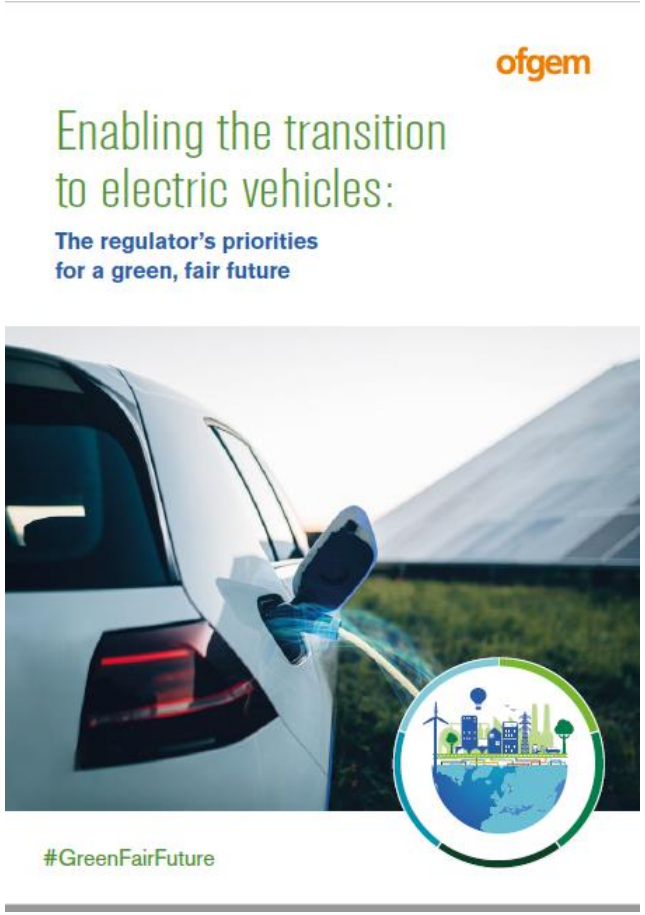
- >1,000,000 plug in cars on road in UK (590k BEV, 430k PHEV)
- 28,832 registrations in Sep 21 – market share of 20.4%
- BEVs now outselling PHEVs
- 70% growth in 2021 compared with 2020

E Mobility – Where are we now and where are we headed?

Ofgem report

Ofgem report

- Potentially 14 million EVs by 2030
- 19 million home chargers and 370,000 public chargers by 2035
- Need to spread demand
  - Smart charging tariffs
  - Vehicle to Grid (V2G), Vehicle to Home (V2H)



E Mobility – Where are we now and where are we headed?

Changes to building regs (published December 2021)

HM Government

INDUSTRIAL STRATEGY

Electric Vehicle Charging in Residential and Non-Residential Buildings

New residential buildings

- **C**harge point to be required for every dwelling with off-street parking
- Multi-dwelling buildings with more than 10 spaces to include cable routes for all spaces

New non-residential

- Every new non-residential building and every non-residential building undergoing major renovation with more than 10 car parking spaces to have one charge point and cable routes for a charger for one in five spaces. (In Scotland, this will be a chargepoint in 10% of spaces and cable routes in 50% of spaces)

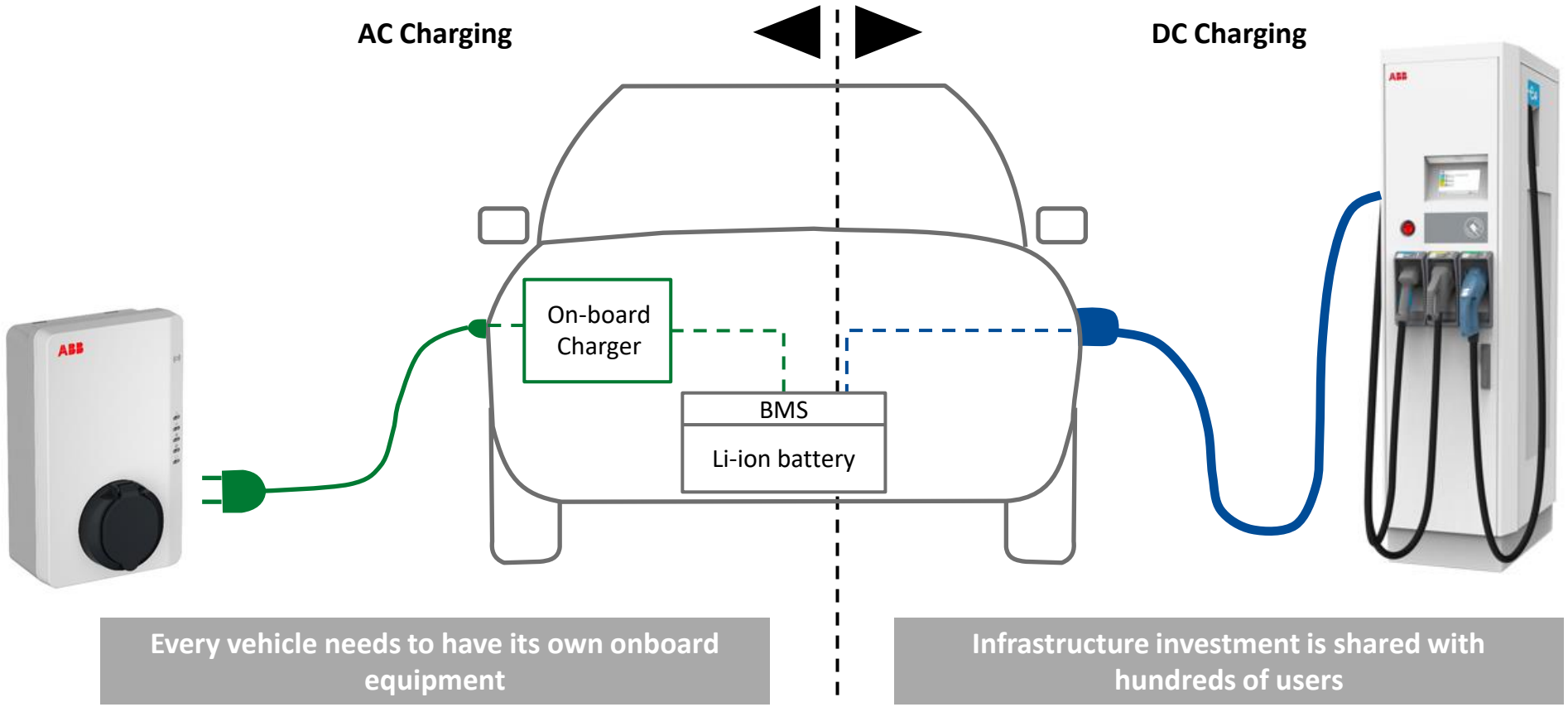
Smart charging (effective 30th June 2022)

- Chargers must require users to set a schedule during initial set up
- Default is to only charge at off-peak times

DC versus AC charging – what?

AC charging vs DC charging

On-board vs Off-board equipment



Public and commercial car charging – Use cases

Charging service should match charging application and demand

Public and commercial EV Charging

AC destination	DC destination	DC Fast	DC High Power
7-22 kW	20-25 kW	50-150 kW	150 to 350 kW+
4-16 hours	1-3 hours	20-90 min	10-20 min
			
– Office, workplace – Home – Multi family housing – Hotel and hospitality – Overnight fleet – Supplement at DC charging sites for PHEVs	– Office, workplace – Hotel and hospitality – Parking structures – Dealerships – Urban fleets – Public or private campus – Sensitive grid applications	– Retail, grocery, mall, big box, restaurant – High turnover parking – Convenience fueling stations – Highway truck stops and travel plazas – OEM R&D	– Highway corridor travel – Metro ‘charge and go’ – Highway rest stops – Petrol station area’s – City ring service stations – OEM R&D

Public and commercial car charging – Use cases

Charging service should match charging application and demand

Public and commercial EV Charging

AC destination	DC destination	DC Fast	DC High Power
7-22 kW	20-25 kW	50 to 150 kW	150 to 350 kW+
4-16 hours	1-3 hours	20-90 min	10-20 min
 Terra AC	 DC Wallbox 24	 Terra 54, Terra 94, Terra 124, Terra 184	 Terra HP

Connection to back-office & payment systems

Manage, monitor and connect to your business

Positioning connected services

Electric cars

Audi, BMW, Daimler, Ford, GM, Mitsubishi, Nissan, Peugeot, Porsche, Renault, Tesla, Volkswagen

Charging infrastructure

CCS
CHAdeMO
GB
AC

ABB

Connected Services

Microsoft Azure

ABB Ability™

Solutions to run a charger network

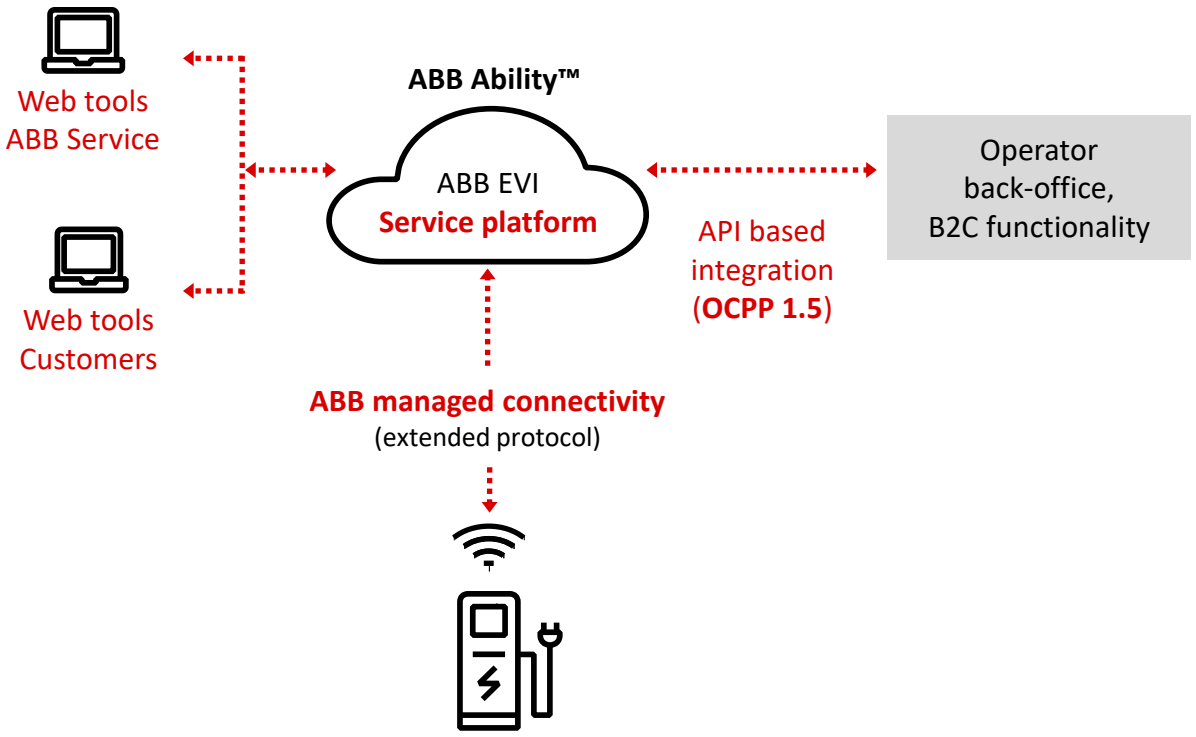
MasterCard, VISA, Virta, Bosch, Fortum, NTT DATA, GRIDPOINT, intercharge, CGI, has·to·be eMobility, chargecloud, pod POINT, Giant Leap Technologies, MOBI.E Mobilidade Eléctrica, greenlots, Ventyx An ABB Company

ABB does not have exclusive cooperation with any of the solutions

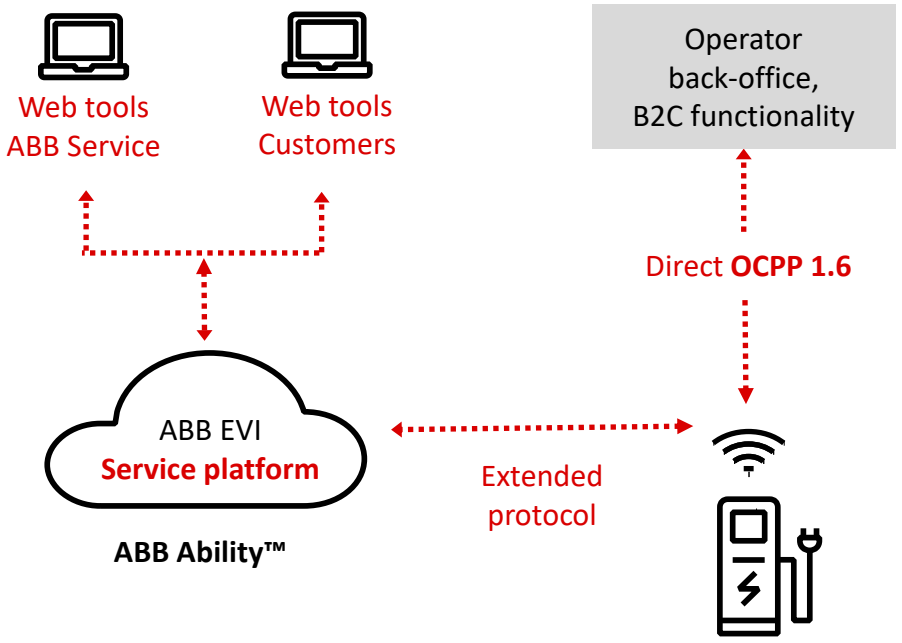
Digital integration of an ABB EV charger

OCPP 1.5 API compared to Direct OCPP 1.6

OCPP 1.5 API



Direct OCPP 1.6 via Dual Uplink



Local authority case studies – where?

Northumberland County Council

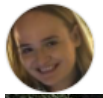
Terra 53 / 54 – 24 units

- Early adopter of public EV charging
- 37 x ABB 50 kW units deployed around the county
- 198 public chargers in total (June 2021)
- 61 chargers per 100,000 people compared with average of 31
- Initially on free vend, but payment terminals recently activated to raise funds to expand network – 62ppkWh (was 32p)

News

3rd March

Northumberland leading way on EV charging points



By Rebecca Curry | @CourantRebeccaC
Reporter

Sheffield City Council

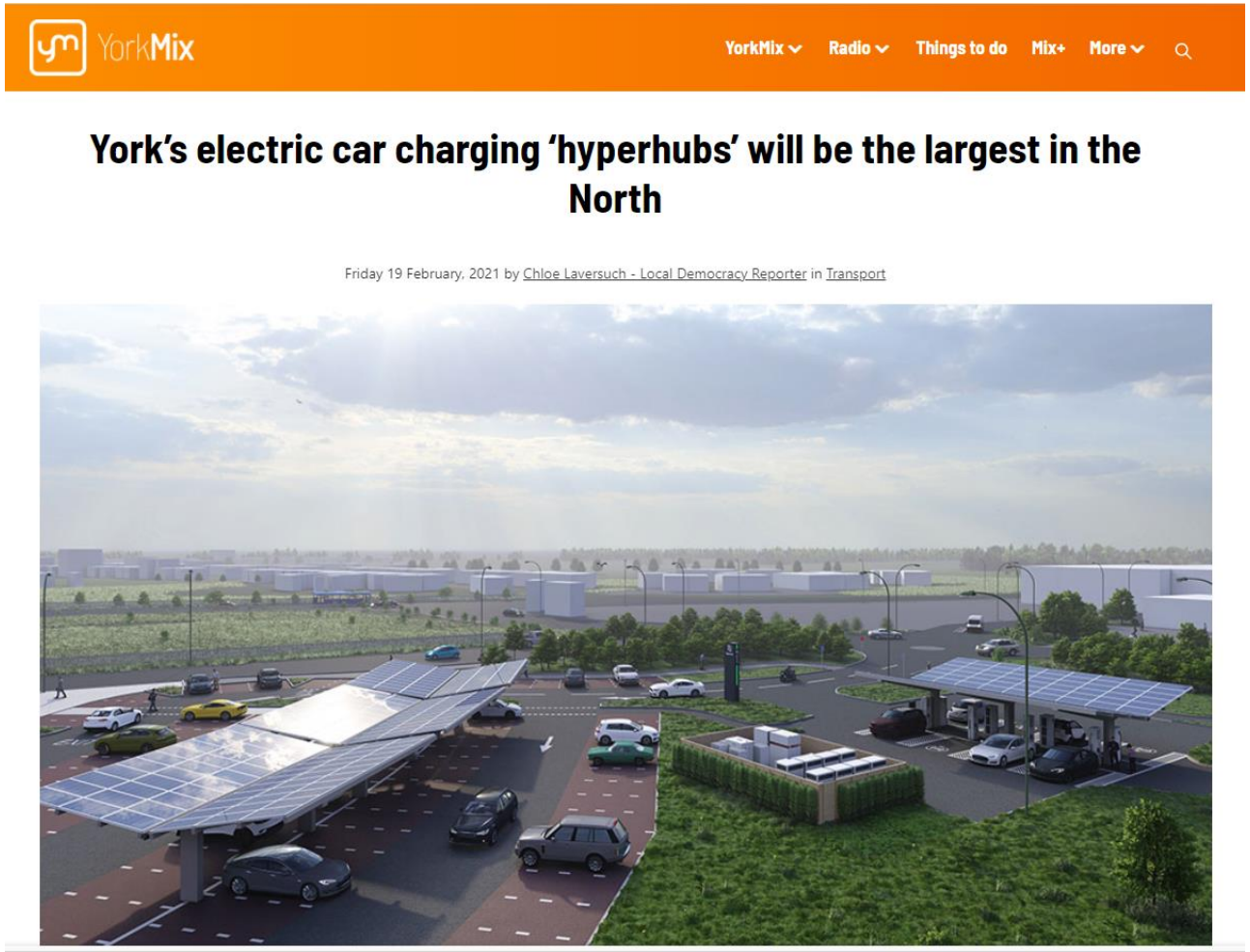
Terra 54 – 24 units

- New network of 18 x 50 kW units for public use in 7 locations across Sheffield
- Additional chargers installed for exclusive use by taxi drivers
- 30p per kWh – contactless or app
- Overstay charges after one hour to encourage drivers to move their car for others to use

City of York Council

Terra High Power, Terra 54HV and Terra AC

- Dual pricing (25p and 20p on launch, now 46p and 35p)



Electric buses

300 kW pantograph bus chargers

- Three at Harrogate Bus Stations were first “opportunity” bus chargers installed in UK
- Two in Kilmarnock – one at the bus station, one at the depot
- Bexleyheath – first panto installed for double-decker bus in UK


ABB

Association for Public Service Excellence

APSE Network Query
RENEW123 – Monitoring the Carbon Impact of Homeworking

Charlotte Banks
Principal Advisor
APSE Energy

RENEW123 - Monitoring the carbon impact of homeworking

This authority is looking to monitor the carbon impact of staff working from home. This includes matters such as extra electricity use for laptops or computers used at home, extra fuel for heating used at home and extra water used at home.

They would like to hear from others who have:

- Introduced methods of monitoring these and related activities; how well they are working; problems encountered; if / how these problems were overcome; if / how this is being reported internally; any definitions for performance indicators; any other thoughts or ideas related to this issue.

Darlington Borough Council

- Used the EcoAct Homeworking Emissions White Paper calculation to estimate homeworking emissions.
- Quick survey of homeworking staff to find out whether or not heating would have been on anyway.
- They had to use the power demand of a workstation from the paper as the data wasn't available for their workstations.
- There are a number of assumptions, for example the calculation assumes that if heating is on, it is heating the whole house not just one room.

Wolverhampton Homes

- Undertake a staff survey to get a sample of homeworking activity.
- For example: energy usage - understand type/number of devices staff use for homeworking (kwh per device multiplied by hours worked); understand subsidiary energy use e.g., lighting, heating, cooking; travel – understand the impact of not commuting to the office (mileage / vehicle type); water use (increase/decrease – there was a report that suggests that water use has decreased due to people taking less frequent showers while working from home; impact on waste (less waste as lunch is made fresh at home, less single use materials etc. and resources (less printing).

Bristol City Council

- Calculated commuting emissions alongside homeworking emissions, since staff will either commute, work from home, or be on leave each day.
- The council used data from the system that allows staff to access council workplaces using proximity cards. If a card is used to access one or more council buildings during a day, the card owner is counted as commuting that day. If it isn't, they are counted as homeworking that day.
- The findings from Bristol's commuting and homeworking emissions calculation were taken into account when setting their post-pandemic working strategy and they will also be included in the Council's public carbon reporting.

South Lakeland District Council

- Currently not monitoring carbon emissions from home working, but they are basing figures on the rough estimates from the carbon trust report written in 2014
- The report states that if you live 7 km or more away from work (and usually drive) you are saving carbon by working from home – but less than that you should go to the office to reduce your carbon footprint.

Rotherham Borough Council

- The electricity use at home for laptops and heating and water would be offset by the travel costs and time saved on commuting to an office. This would be largely dependent on the distance travelled; mode and mobile working requirements; home heating type and home energy efficiency.
- Energy / water consumption is monitored at all Council buildings and is being compared with pre-Covid data. The main office is actually using more gas with less people as the added body heat and laptop heat is no longer there.
- Commuter data isn't monitored but a voluntary data system will be set up in the future.

cl!mate
County Durham

Measuring Carbon Emissions from Home Working

Durham
County Council

Background

- This was a six month partnership project, undertaken January – June 2021, between Durham County Council and Durham University, funded by the LGA / UCL Net Zero Innovation Programme

- Competitive bids were invited for funding of up to £18k for a net zero partnership project between a university and a local authority

- Aim: to explore the impact on carbon emissions from the sudden transition to home working due to the Covid 19 lock down

Project Aims

- We aimed to enrol 100 staff volunteers from Durham University and Durham County Council who would be willing to share their home energy billing data for the year before lockdown (March 2019 – March 2020 and the year of lockdown (March 2020 – March 2021)
- We would compare this with half hourly gas and electricity consumption data from the 7 large office buildings in the University and the Council where these volunteers normally worked
- We would also collect data on each volunteer's normal commuting patterns, including vehicle details where appropriate
- The University would undertake detailed comparative data analysis. Accurate weather data for both years would be included

Challenges

We needed to devise a questionnaire to ensure that volunteers were eligible, to establish:

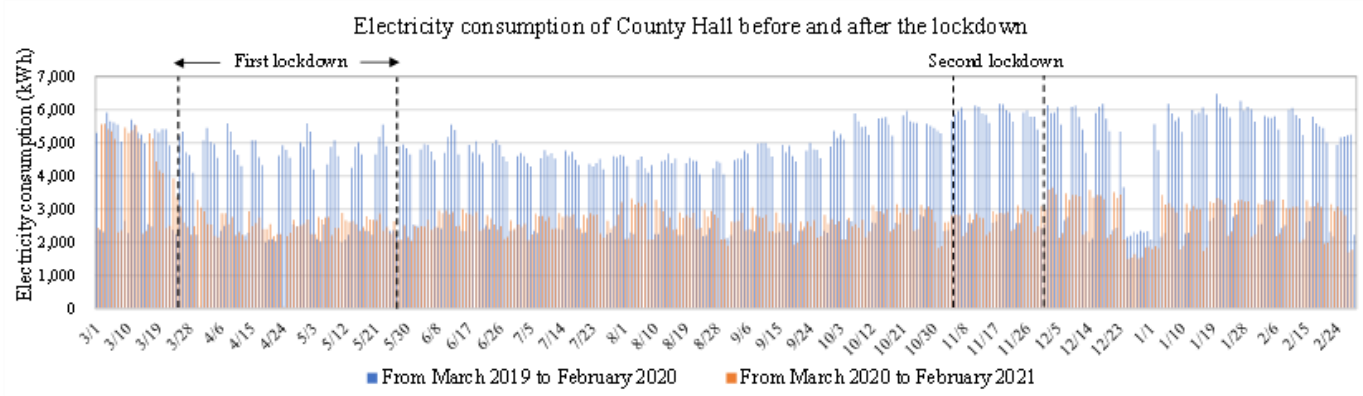
- Continuous residence at the same address for the two year period
- Continuous employment in the same place over the two years
- Whether other people living at the same address could impact the findings (eg school children at home during lockdown)
- Whether people could access their energy data, ideally via a smart meter

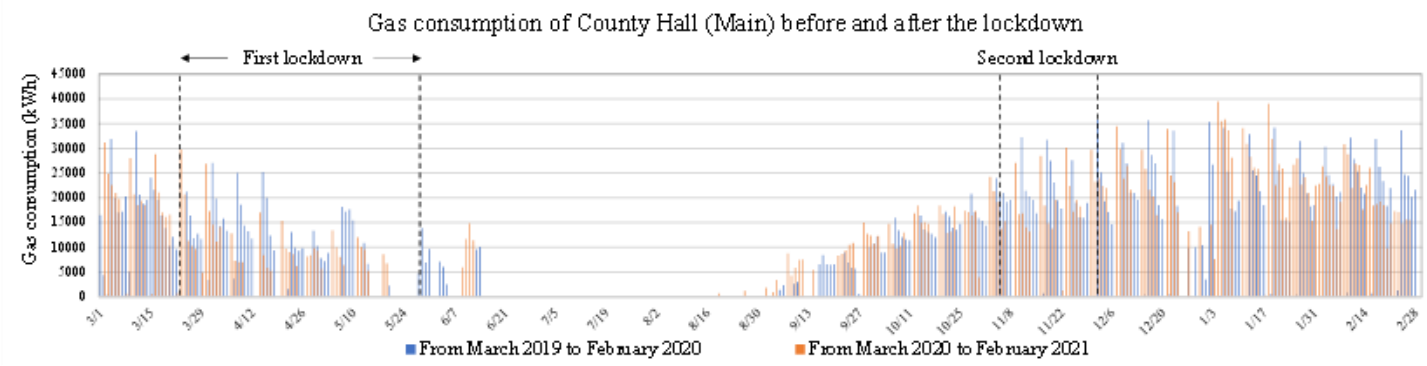
Smart meters: We were disappointed to find that most people who had switched energy supplier over the two years could not access their previous data and that first generation smart meters only stored one year's worth of data!

All these obstacles meant that only 42 volunteers were able to join the project and only 30 of those were able to supply a full data set.

Research Findings - Offices

- The office energy data was analysed in detail by Durham University. This is the two year comparative graph for Durham County Hall (blue is the pre-lockdown year and red is lockdown):
-





Research Findings - Offices

- Each of the 7 building's data analysis told its own unique story:
  - Reduction in electricity consumption over the full lockdown year varied from 8% (in the council's data centre) to 41% (an office) with an average 29% reduction
  - Reduction in gas consumption over the full lockdown year varied from 28% (council office building with simple on/off heating system for a skeleton staff) to 74% (university science building that closed to everyone) with an average of 45%

- Conclusion for office buildings:
  - Detailed understanding of each building is necessary
  - It's a myth that closing the building will stop all consumption
  - We need investment in zoning and more flexible ways of using office buildings to maximise carbon reduction as hybrid working evolves

Research Findings – Home

- The 30 volunteers who could provide their full data all showed some increase in energy consumption when working at home

- The highest individual electricity consumption increase was 141.4%; and the highest gas increase was 22.0%

- The average change in home energy consumptions was:
  - electricity consumption - 30.3% (689 kWh) increase
  - gas consumption - 23.3% (829kWh) increase

- We undertook more detailed dialogue and found many individual issues (eg purchase of an EV or heat pump). Weather data is also important

(the first lockdown took place during warm weather)

Research Findings - Home

- Our most significant finding was from the transport data. To our surprise, **reductions** in carbon emissions from staff not commuting to the office were on average five times greater than the increased emissions from home energy consumption

- We compared this with a study done by Cornwall County Council who found the same results.

- Obviously this varies by mode of travel, vehicle type for private car and
- the average distance commuted

What we have Learned (1)

- This was a project that can't ever be replicated because of the unique conditions (sudden lockdown when five day a week office working was still the norm)
- Don't underestimate how much time is needed to engage volunteers in a complex project like this!
- Smart meters are very disappointing as a tool for measuring long term home energy consumption
- There were significant reductions in energy consumption in all office buildings during lockdown but not as great as would be expected (baseload demand continues; intervention is needed to ensure controls are switched down or off; older heating systems stay on for the very small number of staff in the building, etc)

What we have Learned (2)

- Reducing staff travel from home to office can have a large reduction on overall CO2 emission. The longer the travel distance, the greater the reduction. *(Logically, to maximise carbon savings, staff who walk or cycle to work should be in the office every day and staff who live a long way from the office should work permanently at home!!)*

- Hybrid working is currently unlikely to reduce office emissions significantly because heating and lighting, etc will still be required for those staff working in the office. Consideration of zoning, smart controls and flexible use of office space is needed, to maximise energy efficiency when smaller numbers of staff attend on a daily basis.

- There's a lot more research to be done!

Over to you…

- Have you done any work in your authority on this?
- Have any of the considerations changed since the recent energy price rises?
- Any questions?

Contact details

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