On-street Residential Induction Charging

Phase 2 - Demonstrator

char.gy

The Open University

iPT Technology

WMG THE UNIVERSITY OF WARWICK

London Borough of Redbridge

Buckinghamshire County Council

milton keynes council

News story

Government launches Road to Zero Strategy to lead the world in zero emission vehicle technology

Government confirms ambition to see at least half of new cars to be ultra low emission by 2030 as Road to Zero Strategy released.

- strategy sets out ambition for at least 50% — and as many as 70% — of new car sales to be ultra low emission by 2030, alongside up to 40% of new vans
- government will take steps to enable massive roll-out of infrastructure to support electric vehicle revolution
- strategy sets the stage for the biggest technology advancement to hit UK roads since the invention of the combustion engine

Published 9 July 2018
From: Department for Transport, Office for Low Emission Vehicles, and The Rt Hon Chris Grayling MP

Challenges with how we currently charge EVs

© BBC Look East (10 July, 2019)

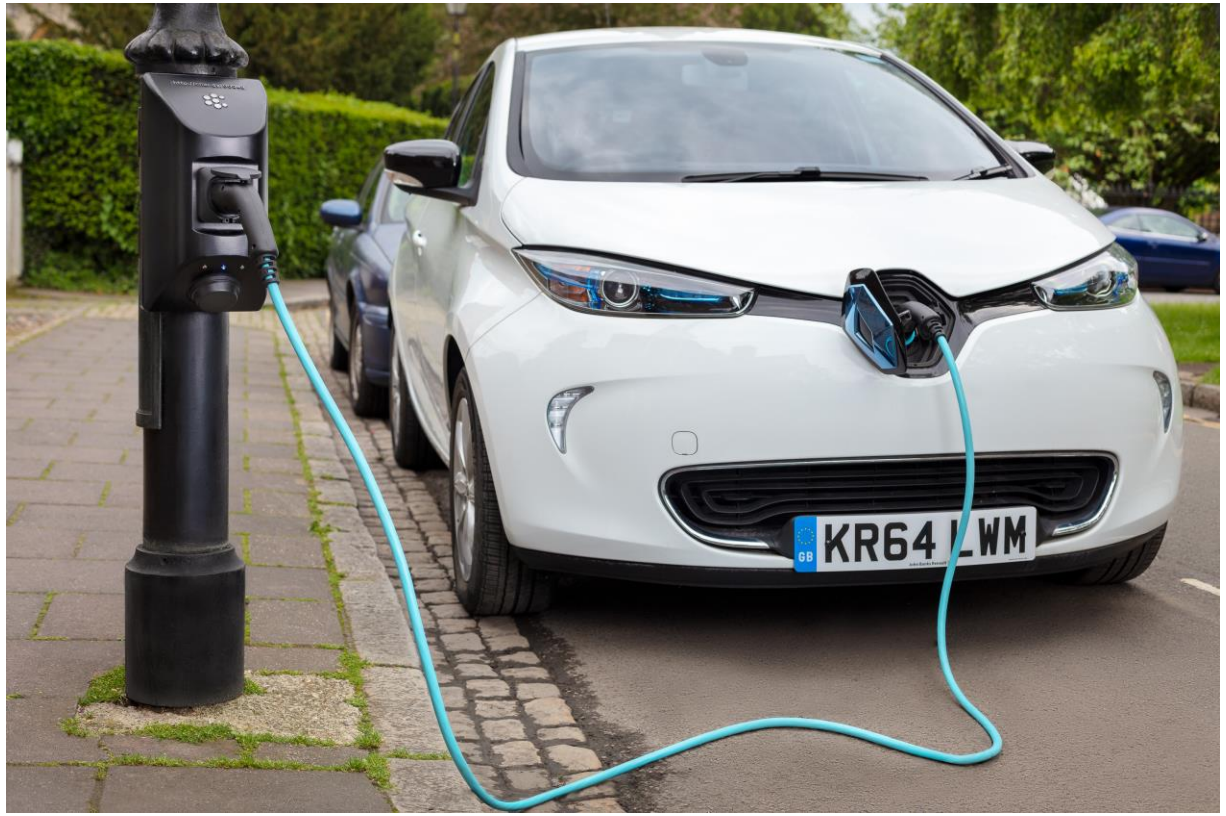
Challenges facing EV drivers with how the charging infrastructure is presently developing

- Destination-charging and rapid-charging at motorway services and petrol stations isn’t a workable solution for everyday charging
  - Inconvenient to have to include ‘time to charge’ in busy, daily routine
- 30% of drivers don’t have off-street parking – higher with lower-income drivers
  - % without off-street parking much higher in some areas
  - Many potential EV drivers dissuaded by ability to charge conveniently near home

What our streetscapes could look like with charge points everywhere

On-street EV Charging from Lampposts

- On-street charging from lampposts in residential areas helps address EV-charging requirements for EV drivers no no off-street parking
- Cost-effective option



Challenges facing On-street EV Charging from Lampposts

- As uptake increases, # parking bays reachable from the lampposts will not suffice
- Heavy cables, hassle of plugging in, dirty hands, long cables in car
- Not all streets have the right sort of lampposts in the right locations
- Increased use of lampposts will introduce more cables on the pavement and contention (competition) for sockets

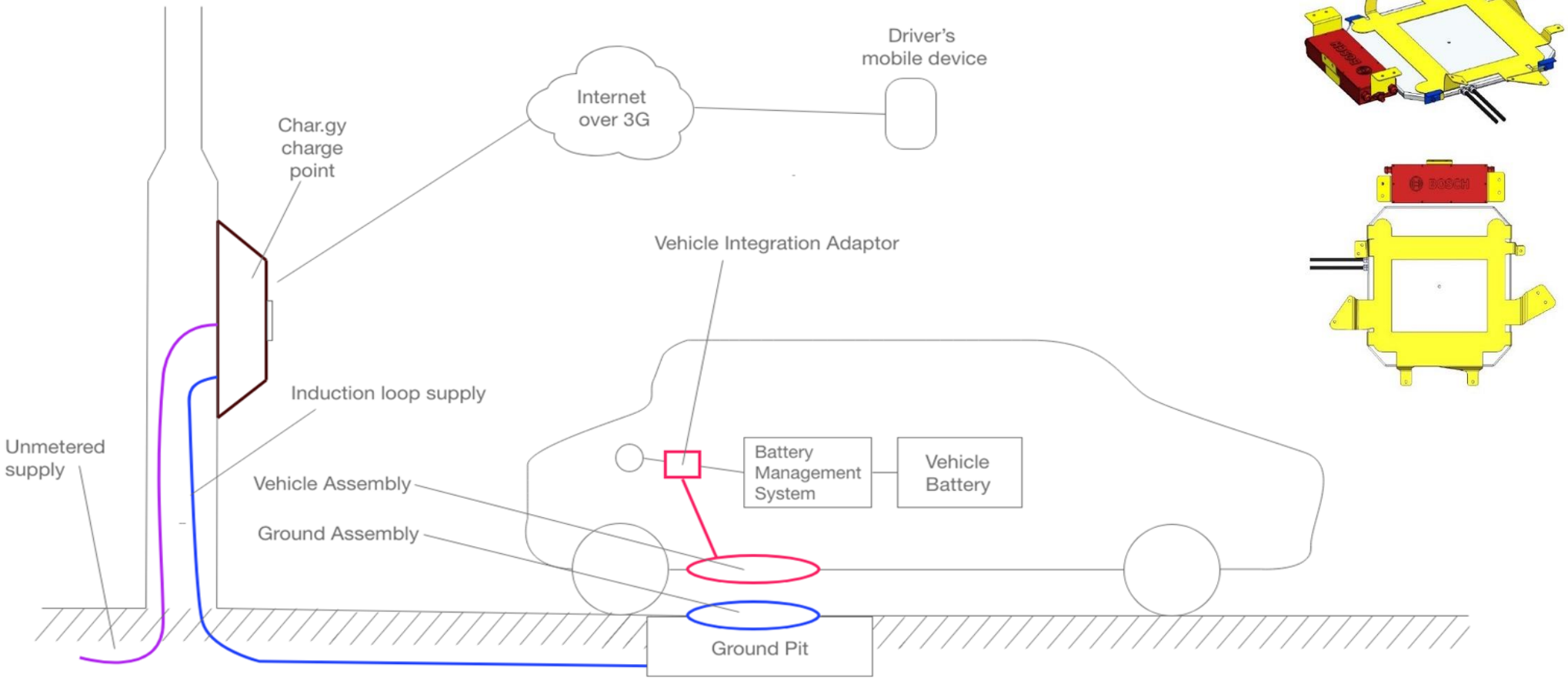
Solution – Induction Charging of EVs

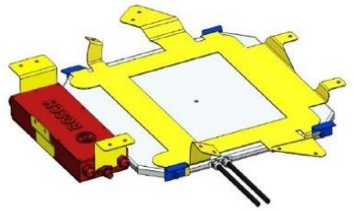
- If the challenges of induction charging can be met, it is an elegant solution
- Convenient – no cables to carry around, plug in and trip over
- No additional street clutter – no additional street furniture required
- Lower cost – no additional power required on streets
- Scalable – ground pads can be added as demand increases
- Seamless integration into the streetscape

Challenges – Induction Charging of EVs

- Interoperability of technology between different manufacturers
  - e.g. EV fitted with induction coil from Manufacturer A parks and wants to charge with a ground induction coil from Manufacturer B
- Cost of vehicle unit & retrofitting
  - Common design to fit the highest proportion of EVs in the market will enable lower unit cost and ease of retrofitting
- Cost and durability of ground unit
  - Durable materials and ease of installation and maintenance designed in

Technology Schematic





On-street Residential Induction Charging (OSRIC) project (1)

- Innovate UK funded, 18-month project
  - £3m total (Char.gy self-financing £700k)
- Project Objective
  - To demonstrate the effectiveness of using induction charging to charge automotive EVs in public, on-street residential parking environments
- Lead Party & Role
  - Char.gy: adapt present EV lamppost-charging system to power and control an induction-charging system (both vehicle & ground units)

On-street Residential Induction Charging (OSRIC) project (2)

- Partners & Role:
  - University of Warwick (Warwick Manufacturing Group):
    - Design and manufacture ground & vehicle hardware for induction charging
  - IPT:
    - Design and manufacture a competing design of ground & vehicle hardware for induction charging
      - Currently manufacture commercial-scale systems
  - Open University:
    - Investigate sociological & industrial barriers to technology adoption
  - 3 x Local Authorities:
    - Provide locations for suitably-equipped car clubs to operate to gather operational data
    - London Borough of Redbridge, Milton Keynes City Council, Buckinghamshire County Council

OSRIC in the News (1)

- https://eandt.theiet.org/content/articles/2019/07/ev-wireless-charging-set-to-benefit-from-37m-government-funding/

By Jack Loughran

Published Tuesday, July 9, 2019

The Government has granted £37m to 12 projects designed to improve the experience of electric car drivers in the UK, including a firm planning to install wireless charging systems on residential streets.

Char.gy was awarded £2.3m to deploy wireless charging technology on residential streets without the need for trailing cables and additional infrastructure.

The firm will trial the technology in Milton Keynes, the London Borough of Redbridge and Buckinghamshire County and the developers say existing electric vehicles can be retrofitted to make use of it.

OSRIC in the News (2)

- https://www.bbc.co.uk/news/business-48913028?intlink_from_url=&link_location=live-reporting-story

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Wireless electric car charging gets cash boost

9 July 2019 | Share

The government is pumping nearly £40m into improving the infrastructure for electric vehicles despite a sharp drop in hybrid car sales.

The Department for Transport will invest in UK engineering to "transform" the network of electric charge points.

Wireless charging and "pop-up" pavement technology are among the investments being made.

OSRIC in the News (3)

- https://www.theguardian.com/money/2019/oct/05/electric-car-ways-to-charge?CMP=Share_iOSApp_Other

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Motoring

Powering ahead: six new ways to charge an electric car

Patrick Collinson *and* Rupert Jones

Sat 5 Oct 2019 07.00 BST

219 1

▲ Char.gy installed the UK's first lamp-post electric car charging units in Marlow. Photograph: Chargy

Live in a flat or terraced house, and feel you can't buy an electric vehicle? Think again

Questions?


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COUNTY COUNCIL


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Climate Emergency Update

The background to the Climate Emergency and its relevance and examples in vehicle maintenance & transport

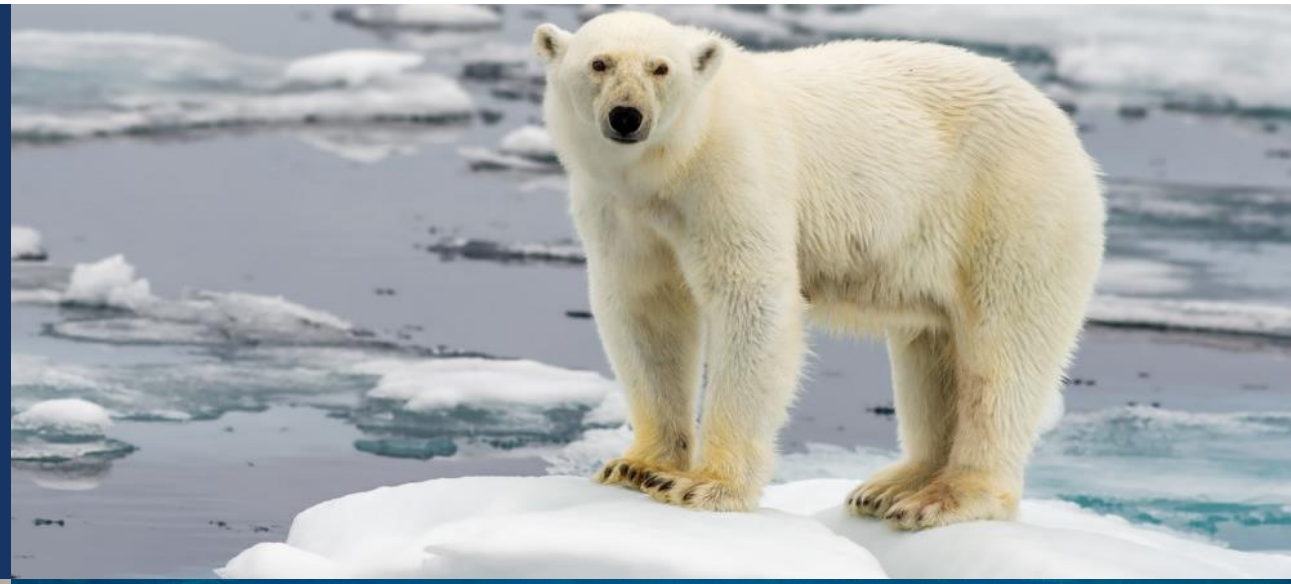
Charlotte Banks

Energy Research and Project Officer

APSE Energy

Background


ipcc
INTERGOVERNMENTAL PANEL ON climate change
WMO UNEP
Global Warming of 1.5 °C
An IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty.



Purpose

- A major motivator for declaring a Climate Emergency is to galvanise support for the climate change agenda and set a clear target by which the council and/or locality will be carbon neutral
- In emergency situations dealing with the problem becomes a top priority, people temporarily set aside business-as-usual and focus intently on determining the safest course of action and doing whatever is required to deal effectively with a threat
- It will empower communities, encourage other councils to follow suit and generally help all of us treat the climate crisis as the emergency that it is
- GREENPEACE oll - Two-thirds of people in the UK recognise there is a Climate Emergency

Examples

Examples

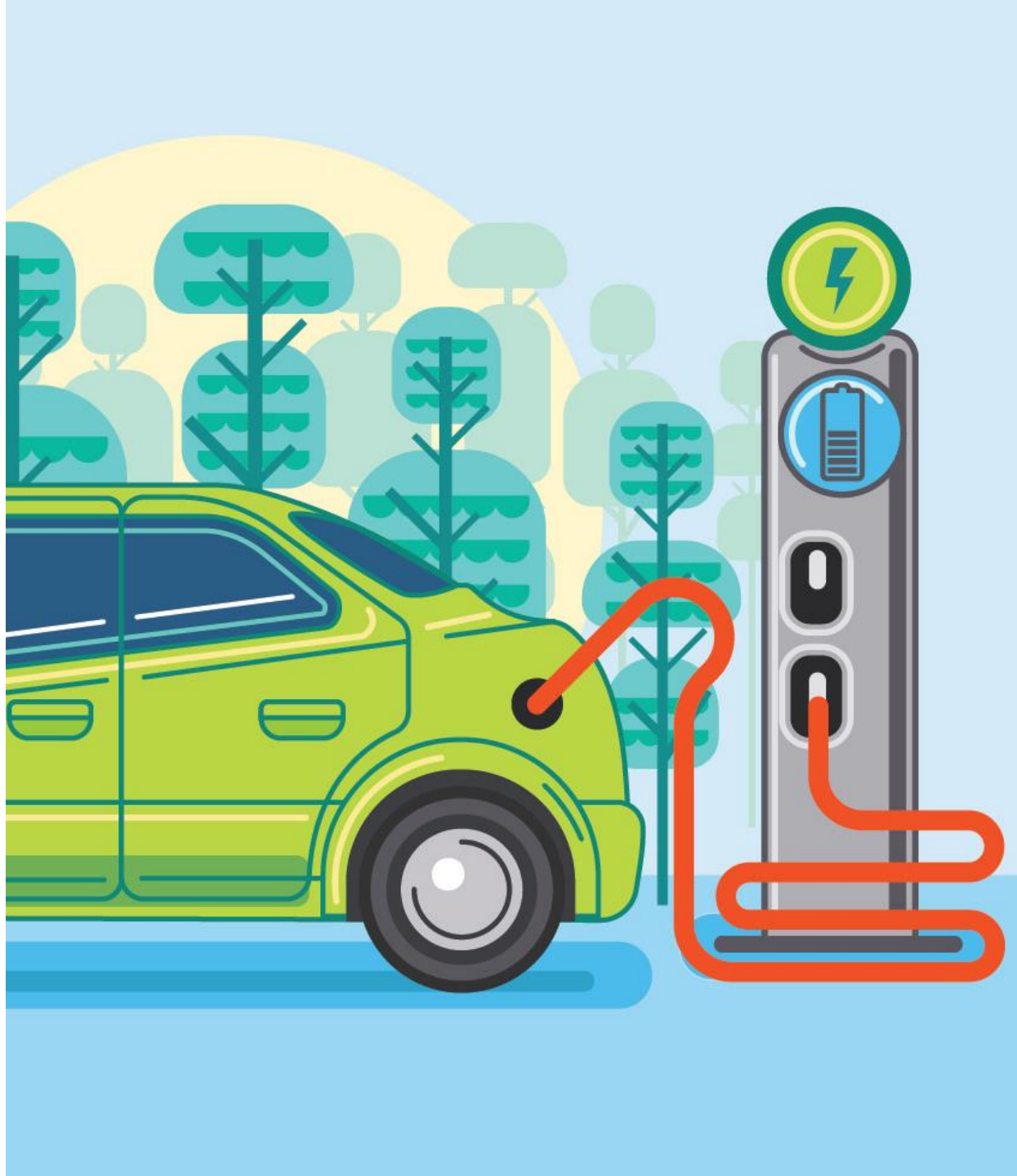
Oxford City Council

- Dangerous levels of air pollution
- Go Ultra Low Oxford
- Lamppost charging pilot APSE Energy publication
- First publication covers design, procurement and installation
- EV purchase scheme
- 3 depots combining to single depot with solar farm & batteries
- Selling current depot land for housing

Examples

Leeds City Council

- June Leeds EV statistics
  - fleet of 1083 vehicles
  - 95 EV's in the fleet
  - 102 EV's on order
  - more out to tender
  - total number of EV when on line 269
- Ambition to fully transition the fleet to zero or ultra-low emission by 2025
- Clean Air Leeds
- Free parking for residents with ULEVs at all Council car parks
- Case study in Energy Across the Authority 2019



Vehicles & Climate Change

- Services heavily reliant on vehicles – significant emissions
- Despite cleaner fuels, vehicle emissions globally have barely changed in last decade
- Ban all diesel and petrol vehicles in UK by 2040
- Road to Zero Strategy

- Main point to reduce & efficiency
- Car free cities
- The Active Wellbeing Society - Birmingham
- Rural, urban issues bin collections etc.
- Innovation, other projects
- APSE Energy event tomorrow - hydrogen

APSE Energy

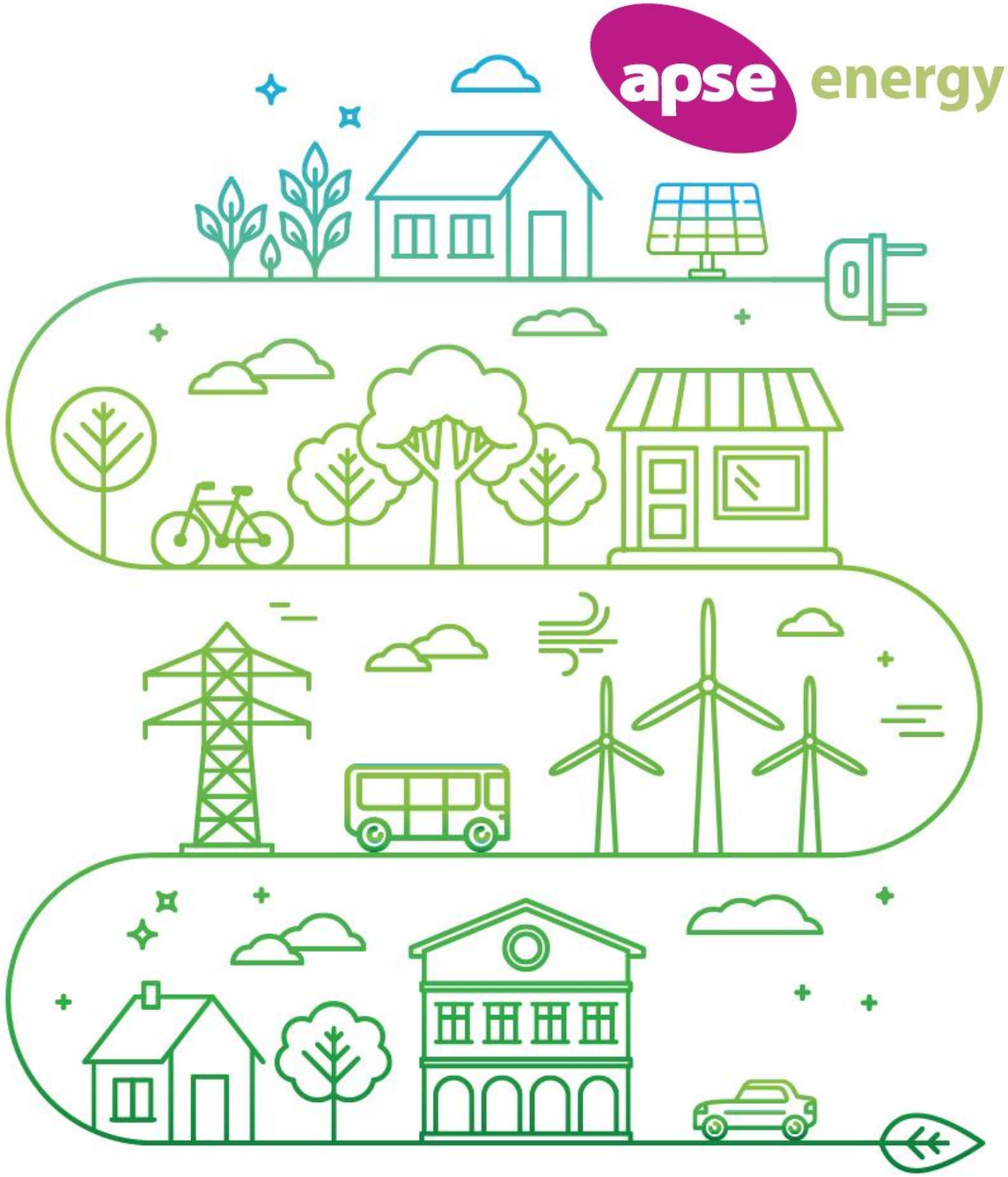
4 Main Areas

- Advocacy
- Knowledge
- Learning
- Consultancy

Support

- Has your council declared a climate emergency?
- Do you have a plan to address it?
- Do you have the staff, capacity and expertise to put your plan into action?

APSE Energy was established to help inform and support local authorities in exactly this kind of situation



APSE Energy Publications

apse energy

apse energy

Local Authority Climate Emergency Declarations

Strategic and practical considerations for climate emergency declarations, targets and action plans

apse energy

How APSE Energy can help local authorities meet the climate emergency challenge

apse energy

YES energy solutions

How ECO3 funding can benefit local authorities

A simple guide to the Government's ECO scheme for energy saving home improvements

Discussion

1. Has your council declared a Climate Emergency?

2. Has your authority set a carbon neutrality target? Do you have a plan in place?

3. What are your plans for greening the fleet?

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Climate Emergency
&
Carbon Neutrality

Alex Minshull
Sustainable City and Climate Change Manager
Bristol City Council

Escalating Targets

2000 – Local Agenda 21

2004 – First Climate Change Strategy – 60% by 2050

2008 – The Big Ask – Climate Change Act

– 40% by 2020 and 80% by 2050

2015 – European Green Capital – 100% by 2050

2018 – Climate Emergency - 100% - All scope - 2030

The Council Motion

Full Council calls on the Mayor to:

1. ***Declare a 'Climate Emergency';***
2. ***Pledge to make the city of Bristol carbon neutral by 2030, taking into account both production and consumption emissions***
3. ***Call on Westminster*** *to provide the powers and resources to make the 2030 target possible;*
4. ***Work with other governments*** *(both within the UK and internationally) to determine and implement best practice methods to limit Global Warming to less than 1.5°C;*
5. ***Continue to work with partners across the city and region*** *to deliver this new goal through all relevant strategies and plans;*
6. ***Report to Full Council*** *within six months with the actions the Mayor/Council will take to address this emergency.*

Managing an Emergency

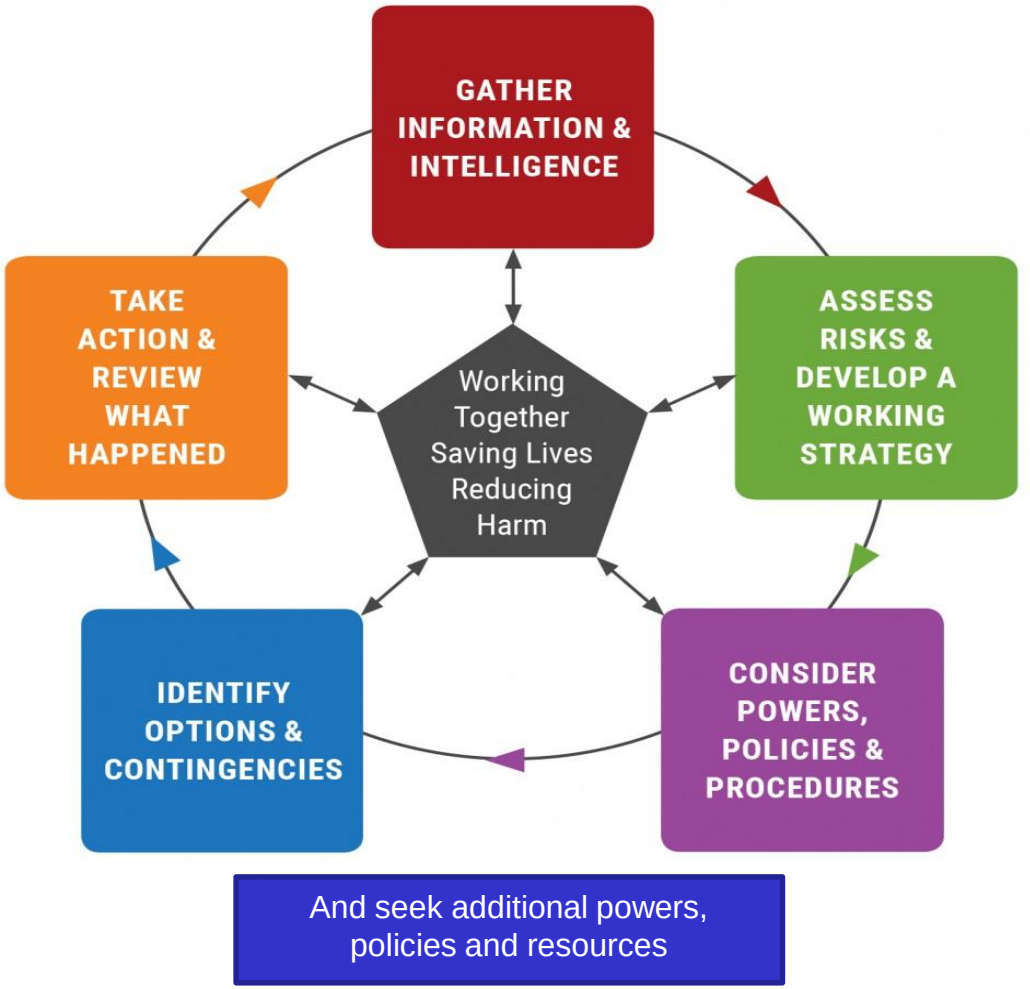
Co-locate
Co-locate with commanders as soon as practicably possible at a single, safe and easily identified location near to the scene.

Communicate
Communicate clearly using plain English.

Co-ordinate
Co-ordinate by agreeing the lead service. Identify priorities, resources and capabilities for an effective response, including the timing of further meetings.

Jointly understand risk
Jointly understand risk by sharing information about the likelihood and potential impact of threats and hazards to agree potential control measures.

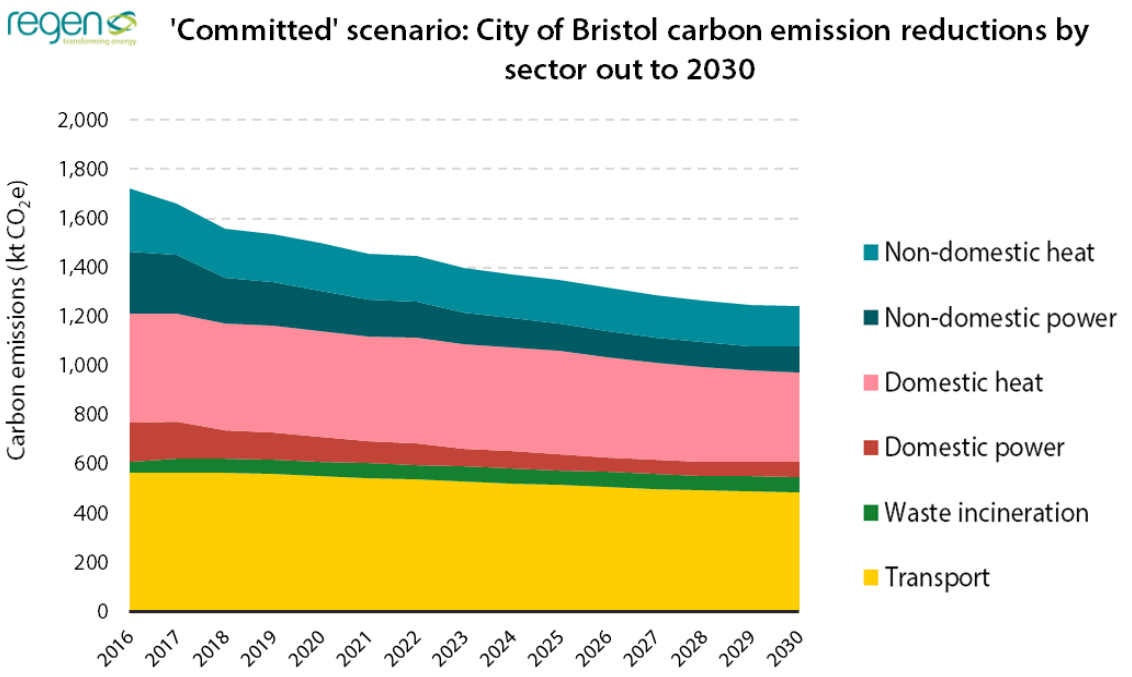
Shared situational awareness
Shared Situational Awareness established by using METHANE and the Joint Decision Model.

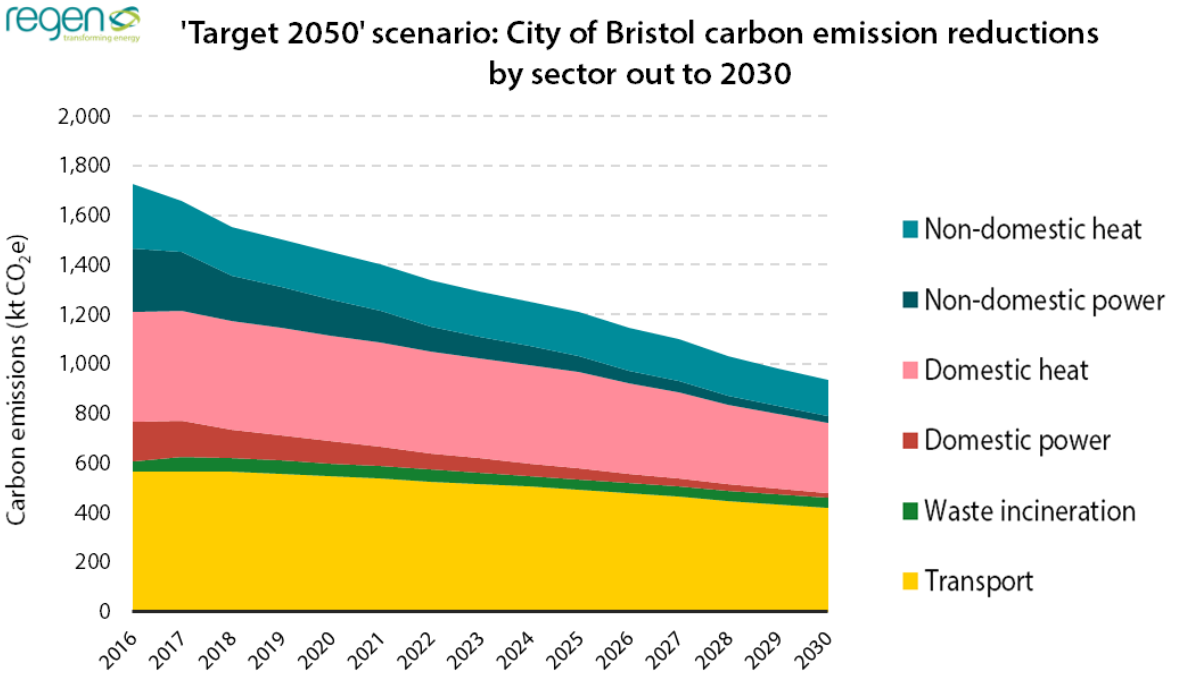


First 6 months

- **“One City” approach** building governance, consensus and support across institutions to create a Strategy and mobilise action – Environmental Sustainability Board – Strategic Co-ordinating Group
- **Building an initial evidence base** to create basis for shared situational awareness
- **Review existing plans and commitments** to demonstrate what is already happening and understand which we can accelerate/ amend
- **Developing political consensus on the action needed -** Cross Party Councillor Working Group
- **Understanding Scope 3 emissions** widening the discussion from energy and transport
- Developing with the Core Cities a **clear “Ask”** for Government and for Investors
- Securing £250k budget for 2019/20

Current ambition - CO_2 falls between 26-45% by 2030





- **The 'Committed' trajectory reduces carbon emissions by 28% and 'Target 2050' by 46%**
- Zero carbon by 2030 would need reductions of approximately 90%, doubling the outcomes from Target 2050
- The lowest reduction is from Transport. The highest is expected from non-domestic energy demand

% reduction in carbon by 2030	'Committed'	'Target 2050'
Domestic	30%	50%
Non-domestic	47%	66%
Transport	14%	26%
Overall reduction	28%	46%

Mayor's Action Plan – Continue to:

- Deliver existing **energy programme** – heat networks, domestic retrofit
- Develop our **City Leap Energy Partnership** – to secure £1bn of investment in efficiency, renewable generation and smart grids etc
- Work with our LEP and Combined Authority to implement the **Energy Strategy**
- Implement new **planning policy** for Zero Carbon buildings
- Expand our **Electric Vehicle** charging network
- Create a new **recycling centre** for residents and Clean Streets Campaign
- Consult on a **Clean Air Zone**
- Develop **flood defences** to protect against sea level rise/ storms
- And more…

Mayor’s Action Plan – Call to Action

- Declare the climate emergency
- Call on all city organisations to recognise that emergency and set targets to rapidly reduce emissions
- Adopt Carbon Neutrality by 2030 as a formal Goal for the city council
- Commit to work to increase the climate resilience of the city

Mayor’s Action Plan – Leading by example

- New target **City Council Carbon Neutrality by 2025** (Scope 1&2)
- **Quantify Scope 3** emissions for City Council
- **Assess all new major plans, policies and projects** re emissions and climate resilience – creating a Carbon Impact Budget
- **Report City Council emissions** to internationally recognised standards through the Carbon Disclosure Project
- **Climate Change Training** for the Mayor, city leaders, City Council senior managers, key staff and Cllrs.

Mayor’s Action Plan – Involving Citizens

- Citywide **86% of citizens** are concerned or very concerned about the impacts of climate change
- We will deliver a **climate change public engagement programme** to engage and empower citizens, understanding the barriers and enabling everyone to contribute.
- Work with the **Youth Council and young people** to involve them in creating the future climate strategy

Mayor’s Action Plan – Creating a city strategy

- The newly created Environmental Sustainability Board, chaired by the Mayor, will lead the creation of a **One City Climate Strategy for Bristol**.
- Mayor has asked the universities to create an **Advisory Committee on Climate Change** to provide this to the Boards, City Office and Council.
- Initial City Council resources have been allocated

Full Report at:
https://democracy.bristol.gov.uk/documents/s34127/Climate%20Emergency%20-%20The%20Mayors%20Response.pdf

Thank You!

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