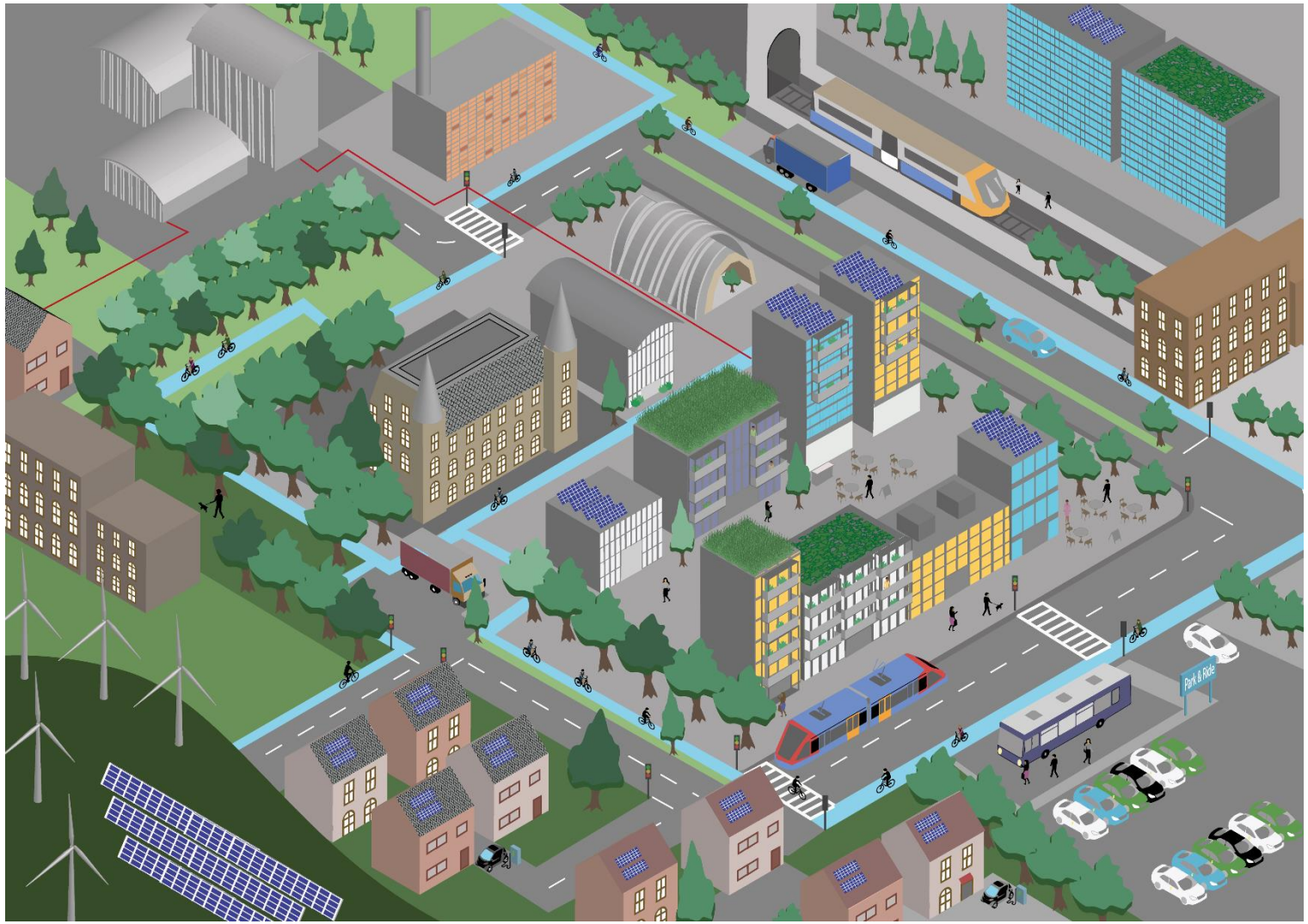
Zero Carbon Sheffield 2030

26th Jan 2021

Andy Sheppard



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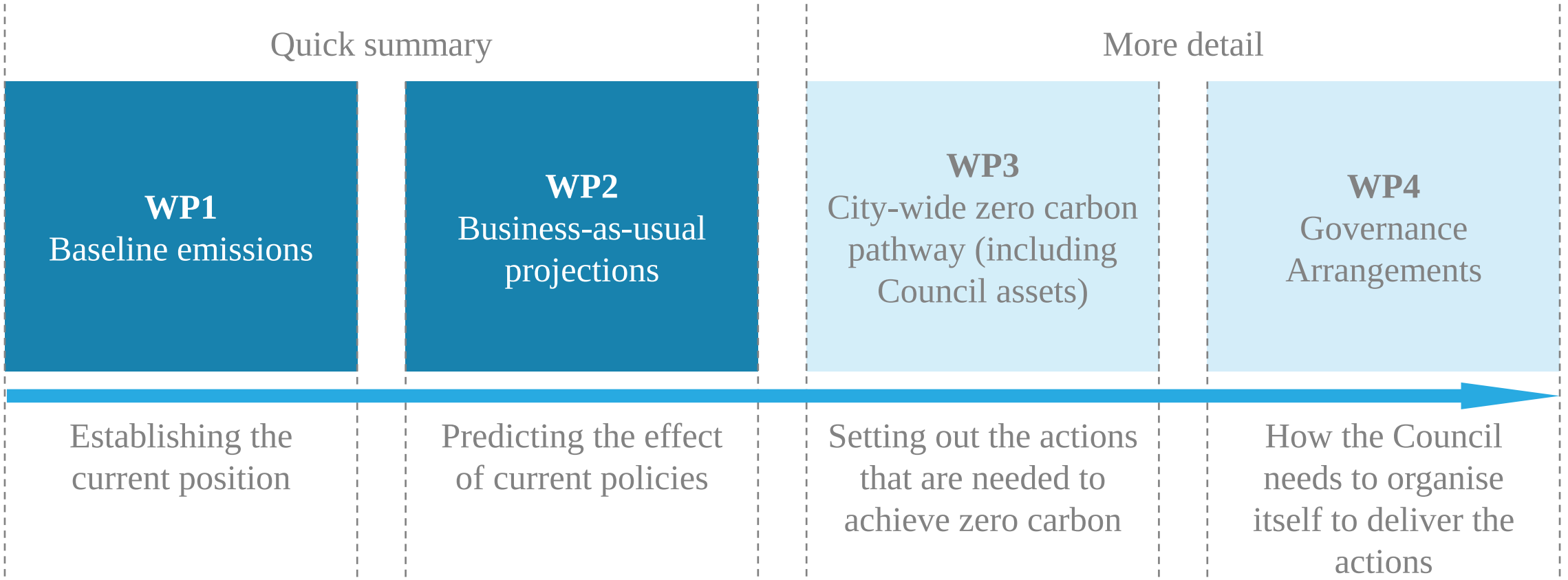
Work Structure



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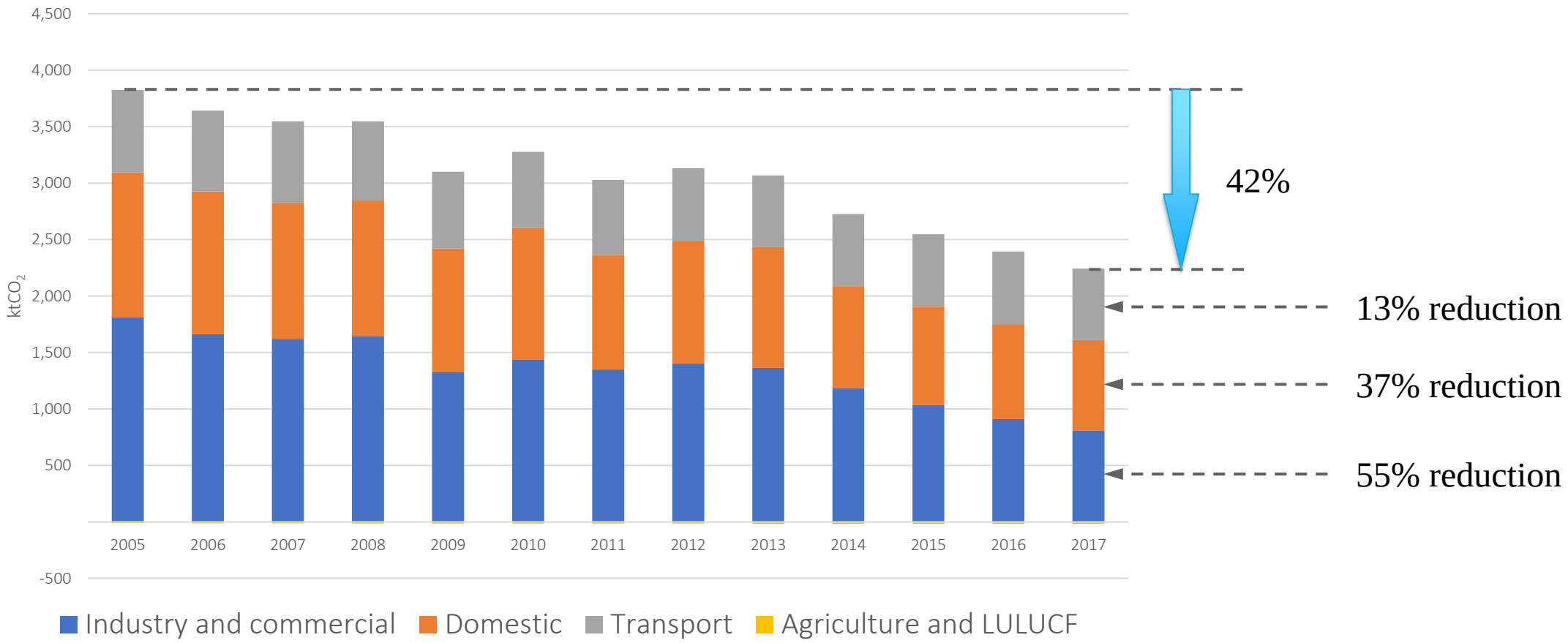
Baseline emissions

Progress has been made but variable across sectors



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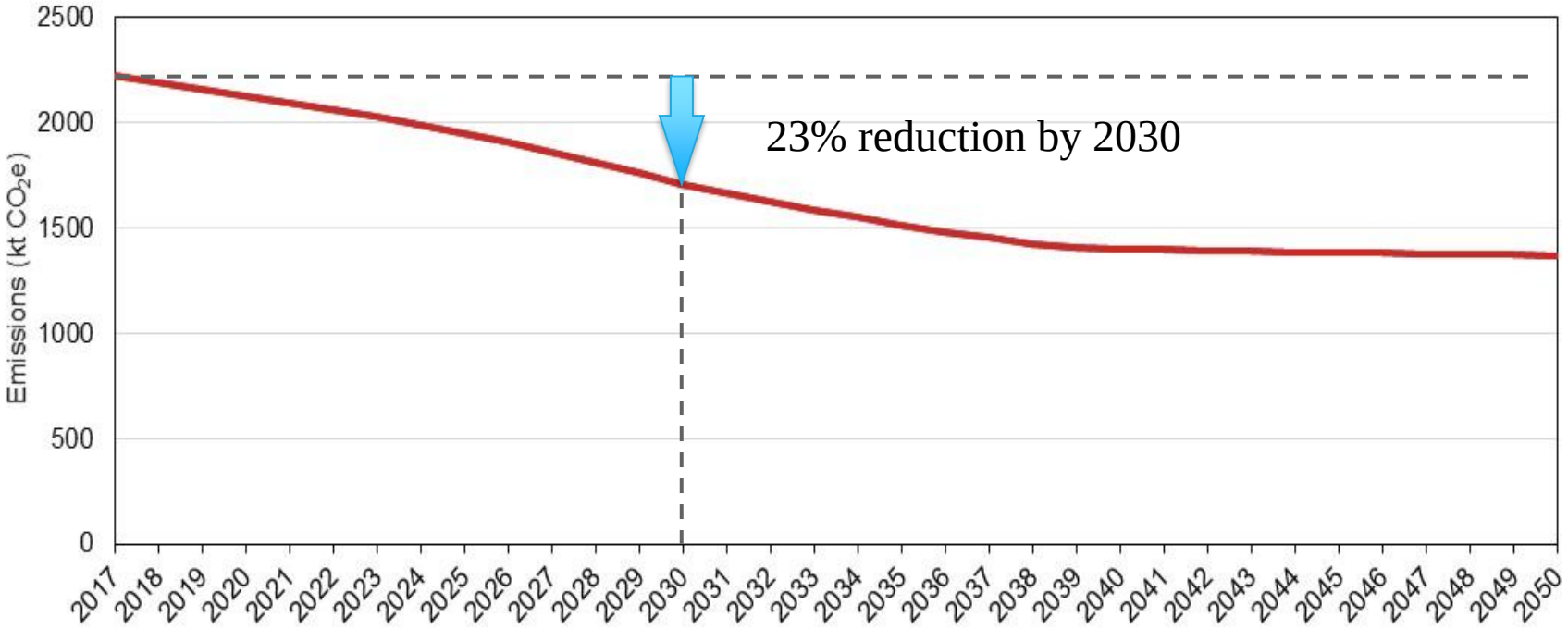
Business as usual (central) scenario

Policy landscape insufficient to reach net zero in 2030



- ✓ Grid Decarbonisations (BEIS)
- ✓ Transport projections (DfT)
- ✓ Growth (Sheffield-specific)
- ✓ Covid dip then bounce-back
- ✓ Future Homes Standard (2020, 2025)
- ✓ Ban on fossil-fuel cars (2040)

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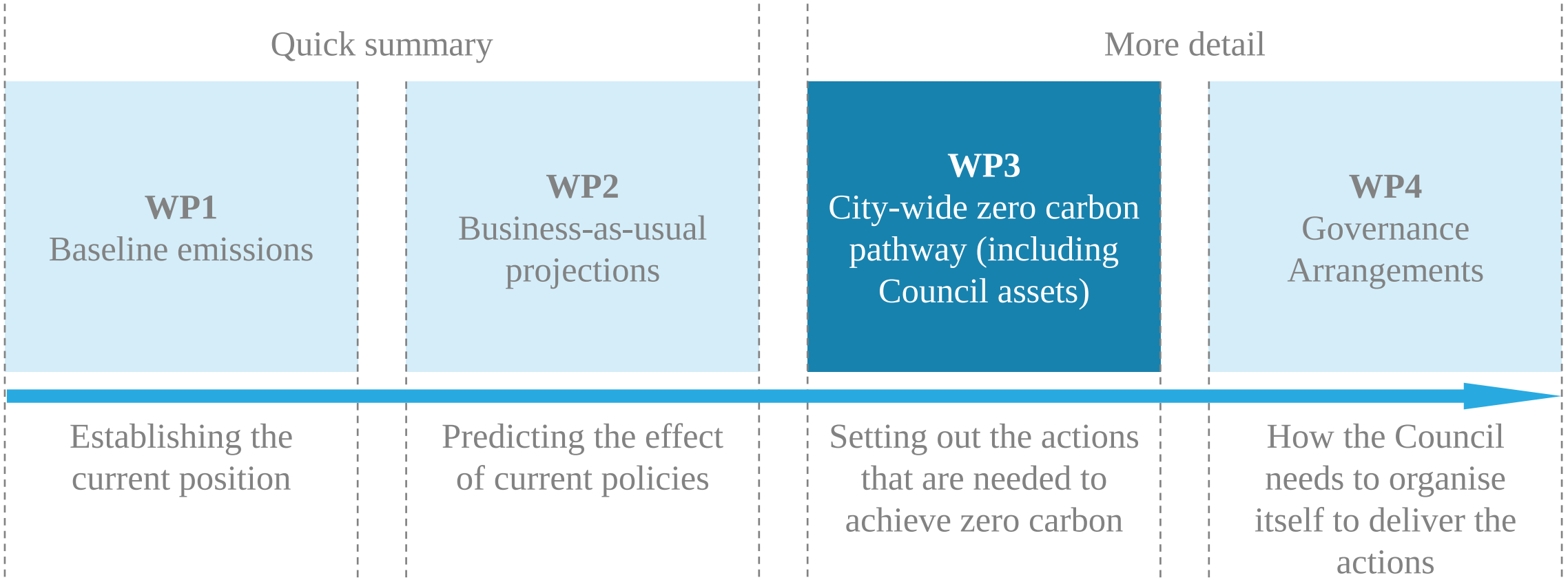

Note: this work is the first step – it cannot have all the detail for all actions needed to realise all interventions

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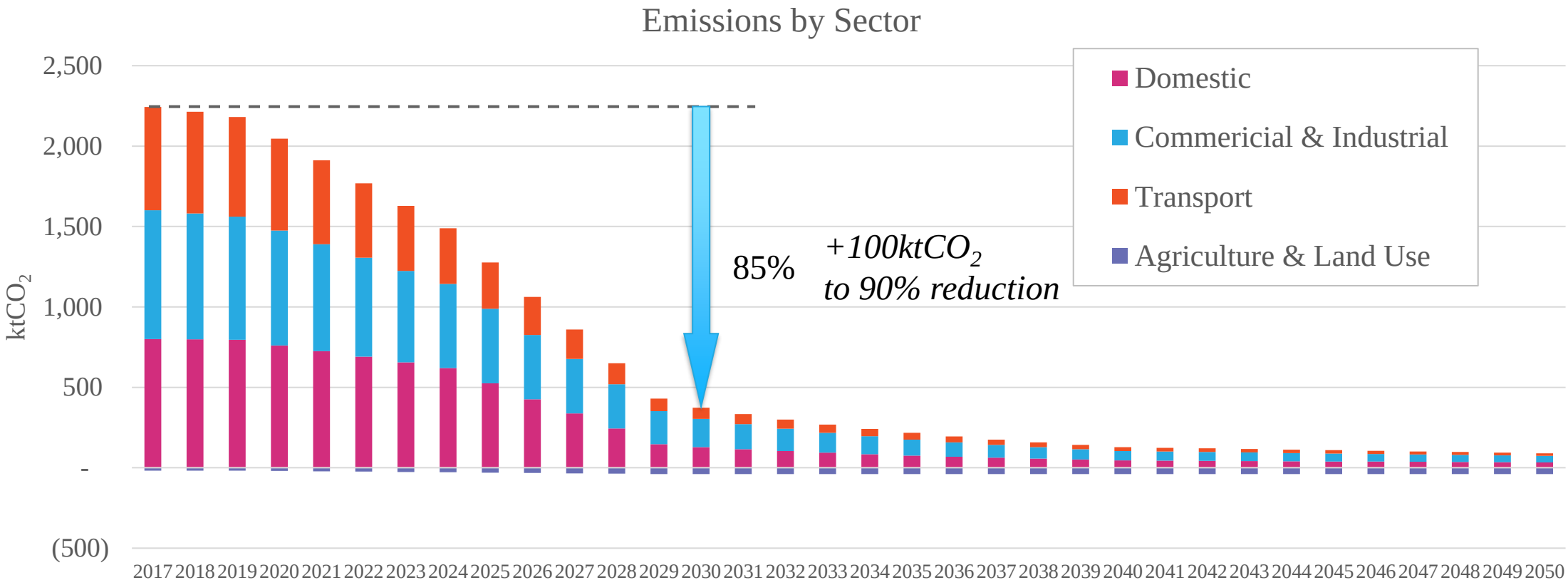
Trajectory – annual emissions to required reduction

Slightly backwards narrative – results first



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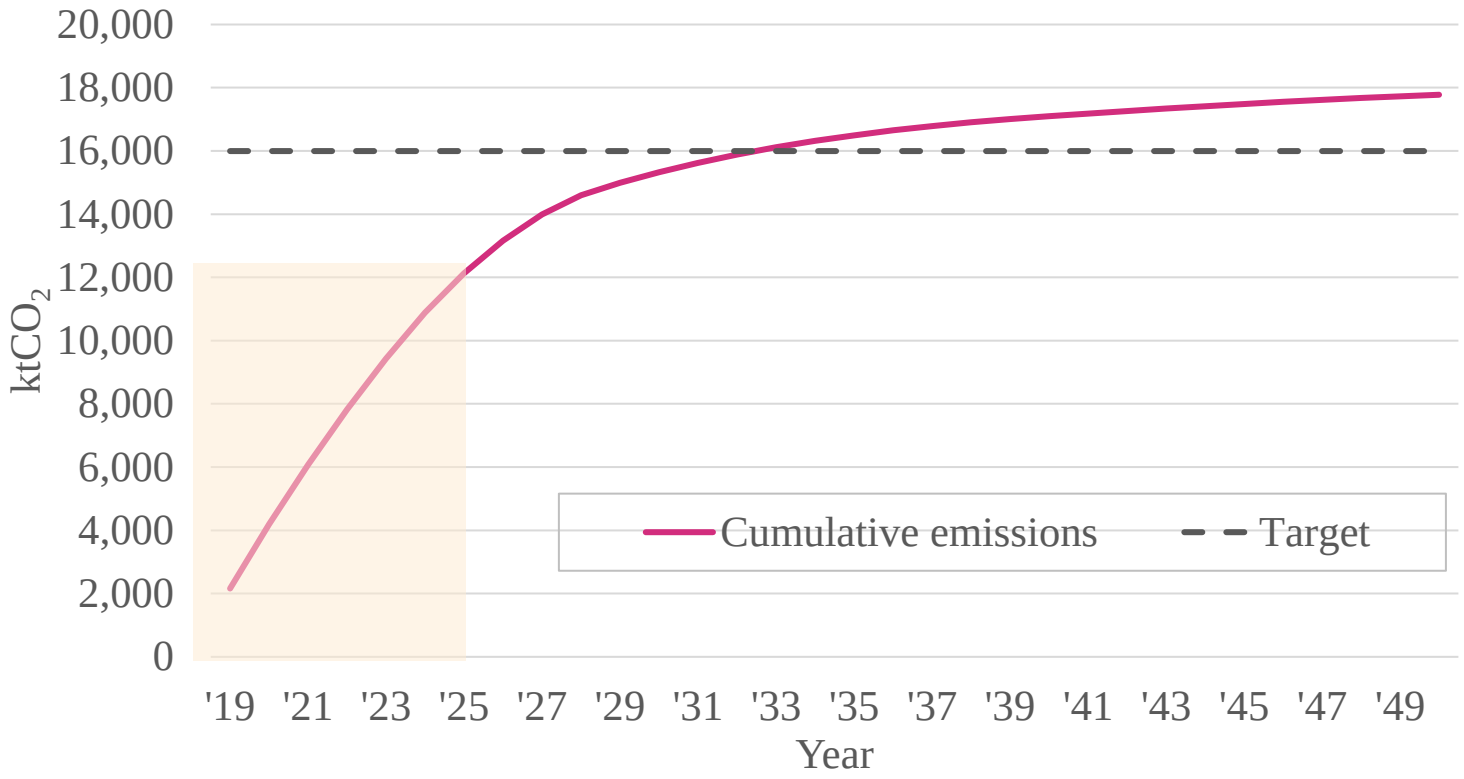
Trajectory – cumulative emissions to total budget



17.8ktCO_2 by 2050 vs target of 16.0ktCO_2

~75% of the budget is used up in the early years to 2025

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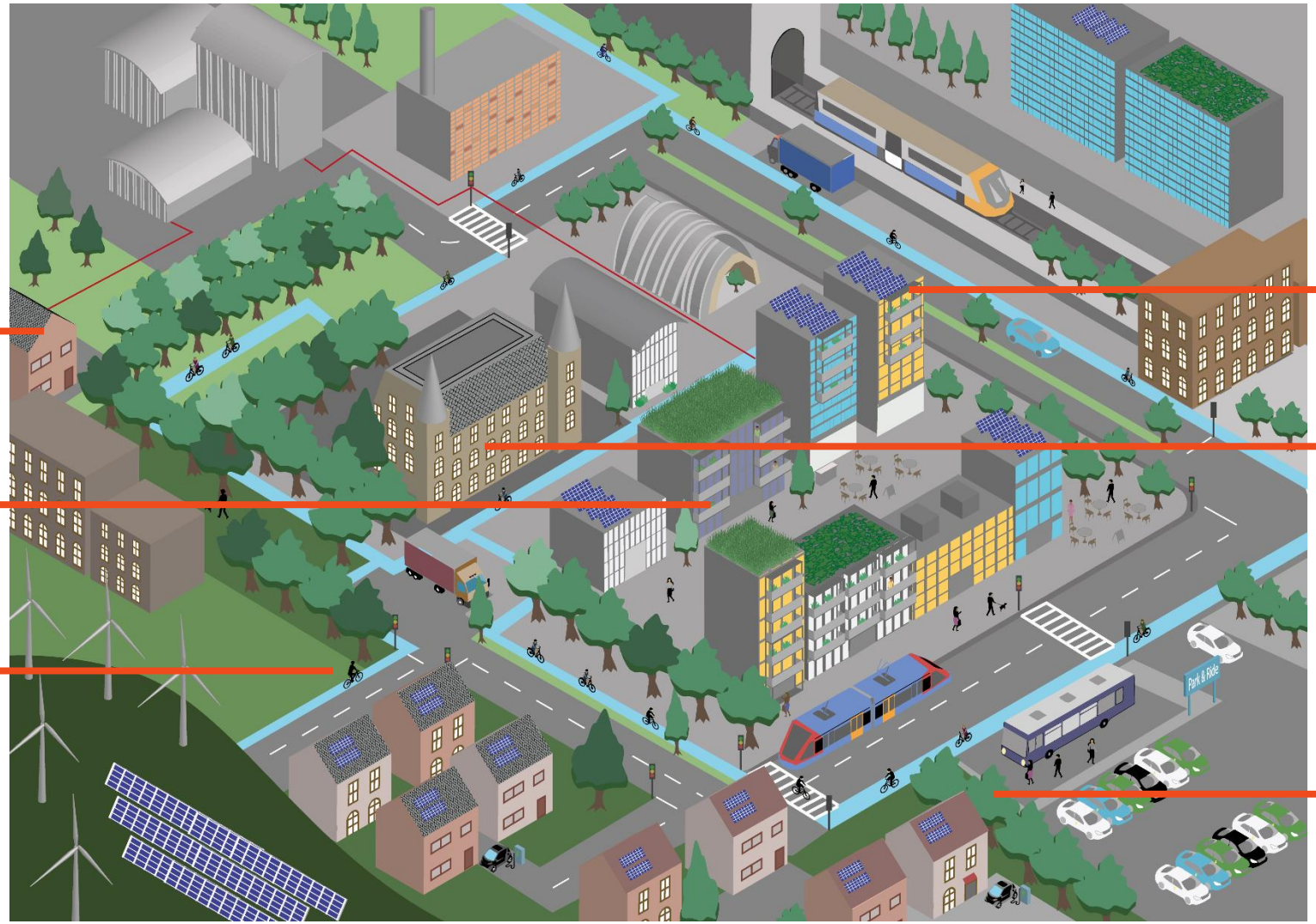
Overview - sectors



Domestic

Commercial & Industrial

Transport

Energy

Council-owned assets

Nature-based solutions

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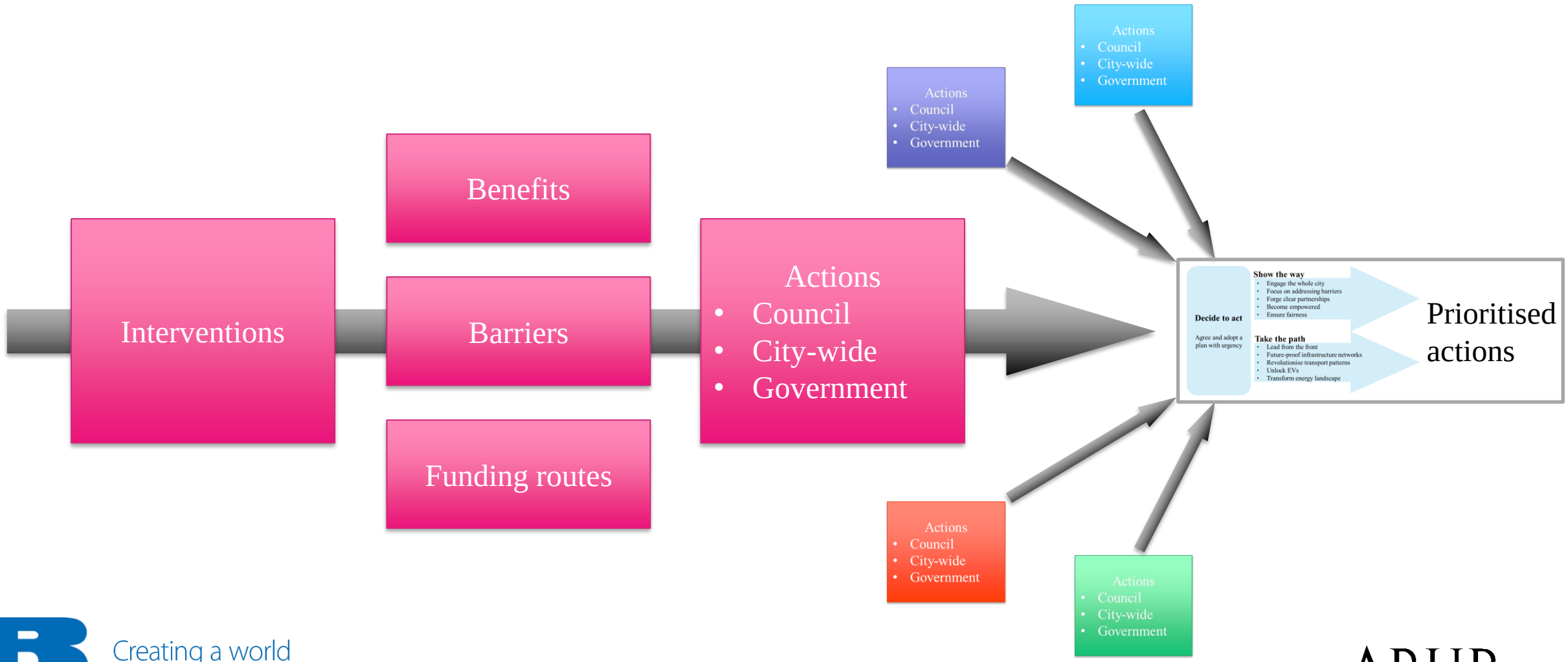
Sector structure



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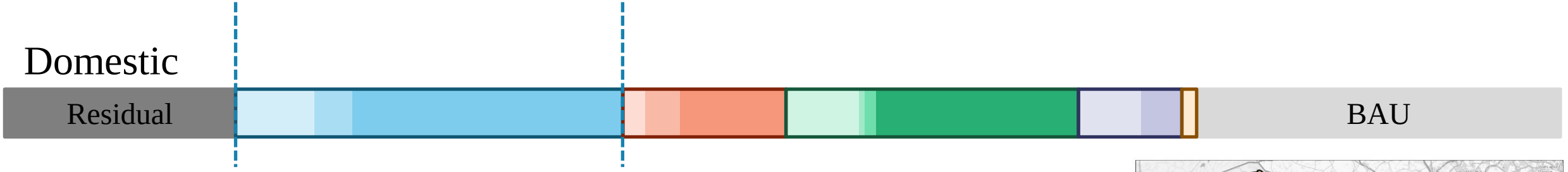
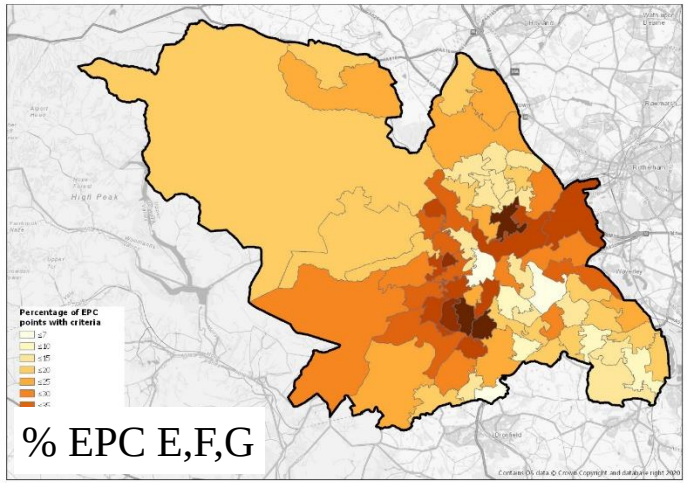
Domestic



Improve fabric
113
$ktCO_2$ reduction

2/3 energy consumption attributed to heating
Wall insulation (76,000 properties)
Roof insulation (47,000 properties)
Floor insulation (150,000 properties)



% EPC E,F,G

Reduce energy consumption
54
$ktCO_2$ reduction

Smart heating controls (220,000 properties)
LED lighting (200,000 properties)
(Behaviour change not modelled)

Remove fossil fuels
386
$ktCO_2$ reduction

Electric cooking (215,000 properties)
Electrified heating i.e. heat pumps (200,000 properties)
Fossil fuel-free district heating (19,000 properties)

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Effectively, every home will need a retrofit programme

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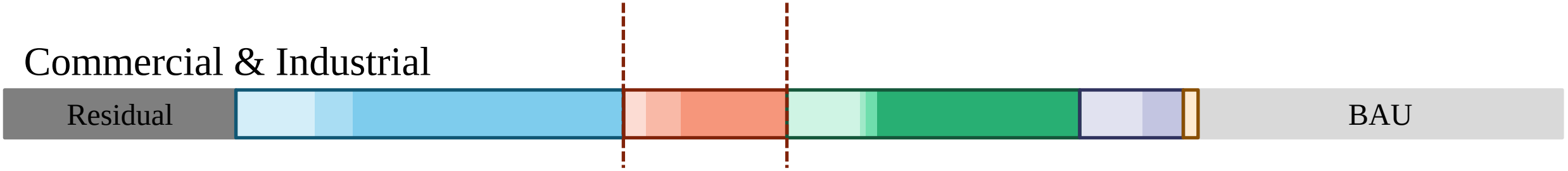
Commercial & Industrial



Improve fabric
33
ktCO₂ reduction

- Insulation
- Draught-proofing
- Glazing
- Doors

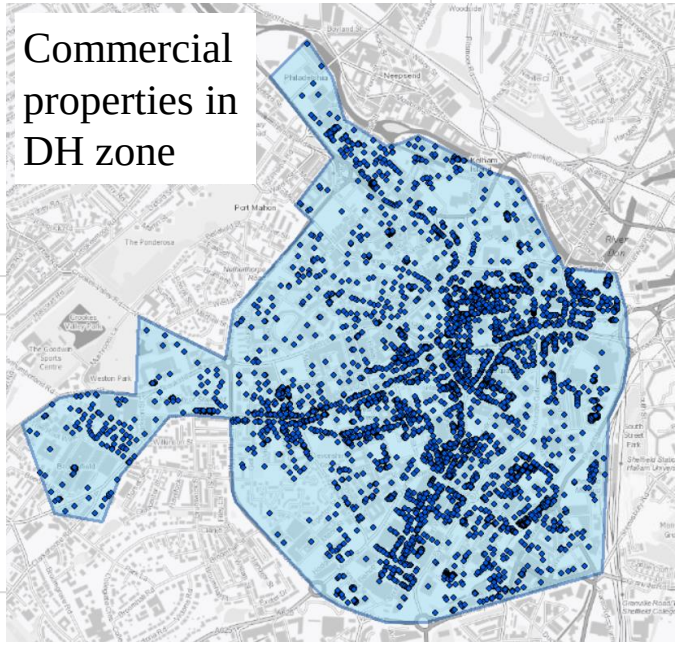
} 15% reduction in energy

Reduce energy consumption
50
ktCO₂ reduction

Smart heating controls (90% of properties)
LED lighting (75% of properties)
Building services and process upgrades

Remove fossil fuels
151
ktCO₂ reduction

Decarbonised processes (assumed 10% fossil fuel use)
Fossil fuel-free district heating (7,600 properties)
Heat pumps for remainder (estimated 15,000 properties)



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Effectively, every business will need a retrofit programme

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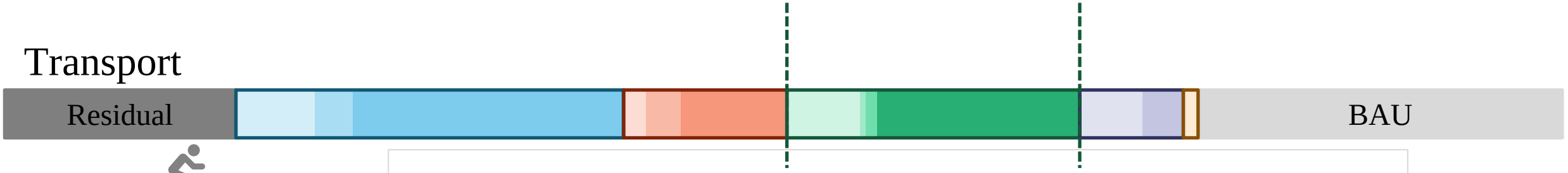
Transport



Increase active travel
104
$ktCO_2$ reduction

36% car trips switched to active travel (250% increase) by:
- Cycling infrastructure, parking and facilities
- Behaviour change

Increase public transport
9
$ktCO_2$ reduction

15% increase in public transport uptake by:
- Bus and tram infrastructure
- Park and ride facilities
- Road pricing and parking levies

Consolidate freight
16
$ktCO_2$ reduction

Freight trips reduced by 20% by:
- Distribution hubs
- Effective route planning
- Alternative vehicles for last-mile delivery

Decarbonise all vehicles
290
$ktCO_2$ reduction

All cars are electric and all larger vehicles are either electric or hydrogen (green)
This will need:
- Charging infrastructure
- Incentivisation

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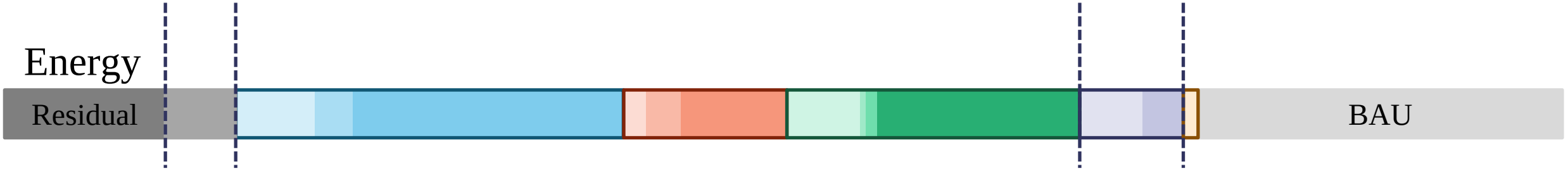
Energy



Decarbonise heat

91

ktCO$_2$ reduction

Expanded heat network zones – city centre and Don Valley.
Additional heat sources will be needed
80% uptake within these zones
Hydrogen a possibility but unlikely before 2030

Small-scale renewable energy

58

ktCO$_2$ reduction

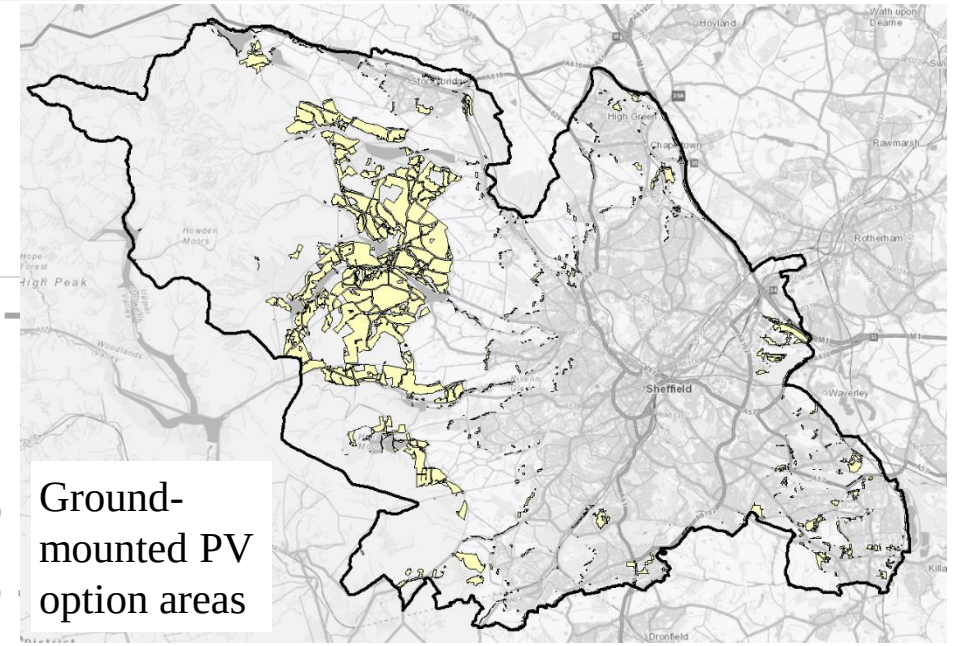
Building-mounted PV - 10-fold current levels
Installation on 20% of buildings
Solar thermal valid but relatively minor

Large-scale renewable energy

100

ktCO$_2$ reduction

Ground-mounted PV (98% of contribution)
Large-scale wind minimal
Energy storage considered (emissions marginal)



Ground-mounted PV option areas

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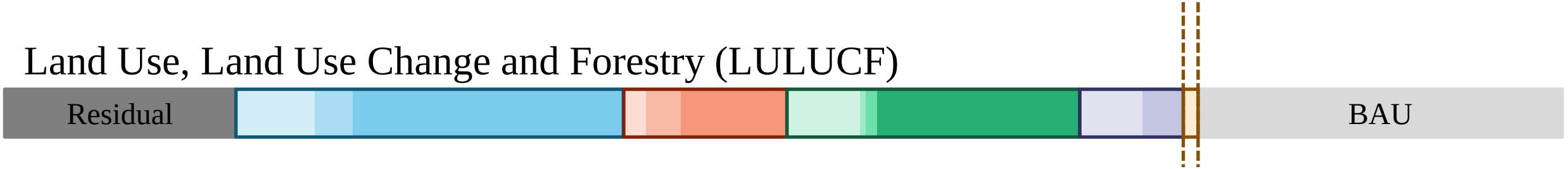
Land Use, Land Use Change and Forestry (LULUCF)



Double LULUCF savings

21

$ktCO_2$ reduction

Doubling sequestration is a reasonable aspiration but challenging
20-fold increase in tree-planting and other activities such as peat-bog restoration
Minor contribution overall (in pure carbon terms only)

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Costs

Sector	Estimated costs
Domestic	£2 billion - £5 billion
Commercial and industrial	£1 billion - £10 billion
Transport	• £1m - £1.5m per km for cycle superhighways • £0.45m - £0.9m per km for strategic cycle routes • £0.2m - £1.5m for junction modifications • £0.45m per km for bus lanes • £25,500 per space for a park and ride facility • £0.2m - £0.35m per electric bus • £075 - £1m per single track km for rail electrification
Energy	£1 billion
Land Use, Land-Use Change and Forestry	Small

The vast majority of these costs are not borne by the council

The Council has a role in enabling, facilitating and encouraging this action/spend in others

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Barriers – will always exist

Technical

Financial

Political

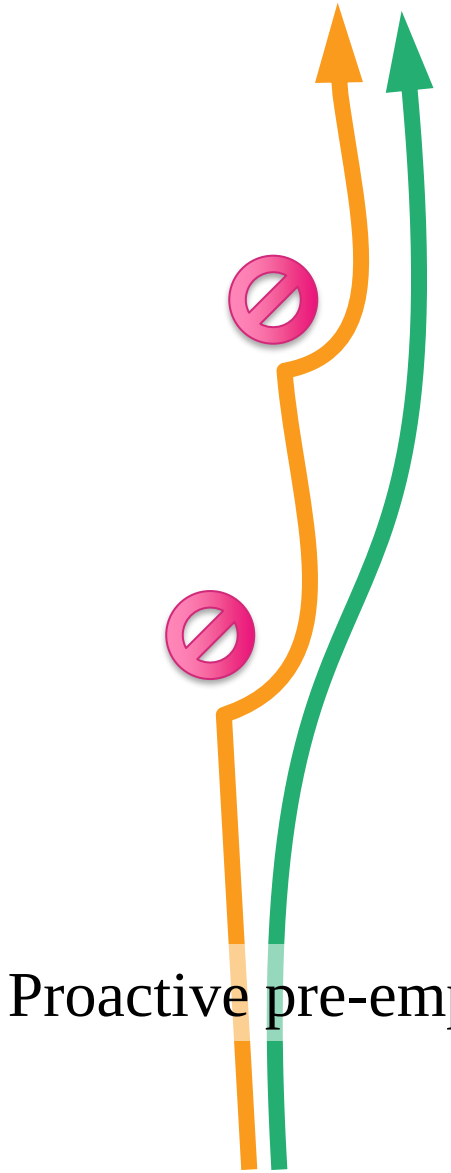
Societal

Delivery

Barrier innovation:

5% of work
unlocks
90% of interventions

SCC's role is almost
entirely barrier removal:
Enabling – Facilitating



Proactive pre-empting

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Benefits

Domestic	Commercial & Industrial	Transport	Energy	Nature-based
Reduced energy costs	Reduced energy costs	Health & wellbeing	Employment & skills	Climate resilience
Improved occupant comfort	Improved air quality	Air quality	Income generation	Political
Improved air quality	Employment and skills	Local economy	Air quality	Health & wellbeing
Employment & skills	Reputational	Wider economic	System resilience	Biodiversity
	Future-proofing			Flood alleviation

Not zero carbon in isolation – zero carbon as a driver for a thriving recovery

Transition is inevitable – benefits of being ahead of the curve

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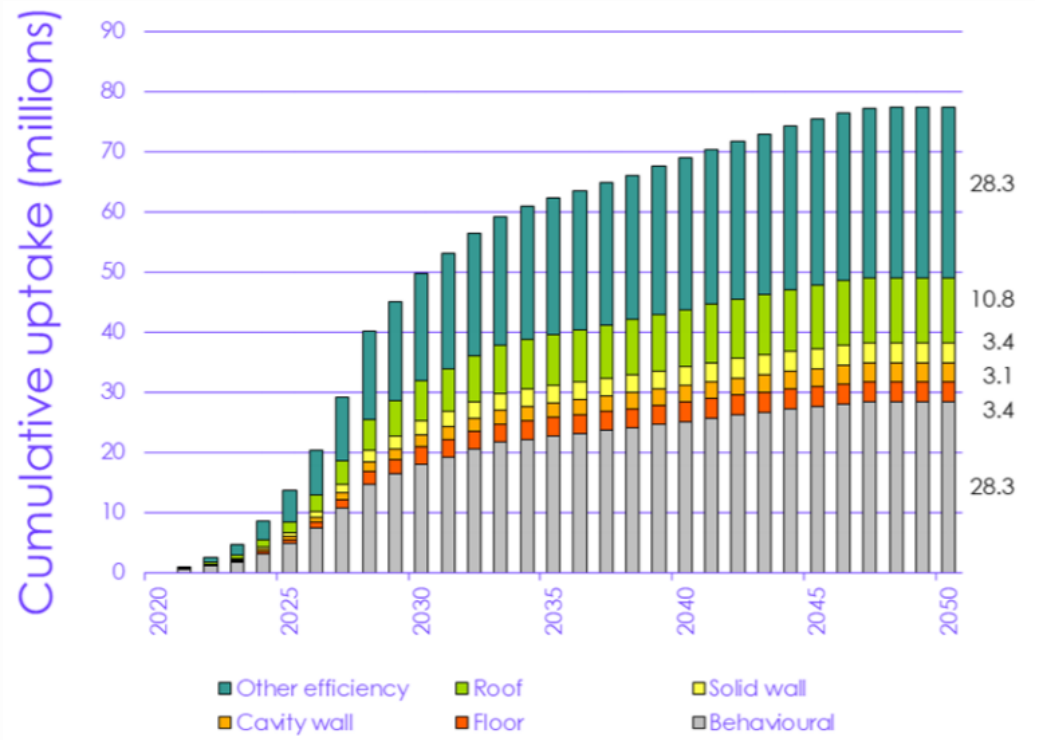
Largely from Ten-Point Plan and CCC Sixth Carbon Budget

A changing landscape

2020	2021	2025	2028
Non-EV cars banned from ~~2040~~ ~~2035~~ 2030 Green Homes Grant extended	Heat and Buildings Strategy expected 4,000 zero-emission buses delivered	National cycling rates doubled Fossil fuel replacements banned in non-domestic 250,000 annual solid-wall insulations targeted	1,000,000 residential heat pumps annually Rented homes EPC ‘C’



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Prioritised actions for the short term

Decide to act

Agree and adopt a plan with urgency

Includes instigating organisational changes to improve leading, resourcing and delivery of programmes

Show the way (enable)

- Engage the whole city
- Focus on addressing barriers
- Forge clear partnerships
- Become empowered
- Ensure fairness

Take the path (build momentum)

- Lead from the front
- Future-proof infrastructure networks
- Revolutionise transport patterns
- Unlock EVs
- Transform energy landscape

Majority of emissions reductions:
Wholesale retrofit
Reskilling
Electrification
Business transformation
Active travel shift
Vehicle changeover
Energy infrastructure
Renewable proliferation
Nature-restoration

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Prioritised actions for the short term – Show the Way (enable)

Engage the whole city	An intense and continuous programme of communication and engagement to drive awareness and change in all areas of life in Sheffield.
Focus on addressing barriers	A brave and purposeful attack on the most often quoted barriers, embracing them as identifiers of real potential change as opposed to being too difficult to address.
Forge clear partnerships	A series of key partnerships where the overall purpose and everyone's role is clearly understood and the Council takes a lead in providing direction and maintaining momentum.
Become empowered	A clear 'ask' on what new powers are required to maximise the impact of work towards zero carbon and their benefits – coordinated with other cities if possible.
Ensure fairness	A clear plan to highlight the synergies between climate action and the ability to address inequalities and a mechanism to ensure these are investigated and acted upon.

Prioritised actions for the short term – Take the Path (build momentum)

Lead from the front	An immediate and wide-ranging programme to convert all Council-controlled assets to a condition that is ready for Zero Carbon 2030.
Future-proof infrastructure networks	An identified set of critical networks, their vulnerabilities to the changes expected of them and a coordinated plan enabling a successful Zero Carbon 2030.
Revolutionise transport patterns	Local centres connected by a network of cycling and walking infrastructure that complements excellent public transport provision.
Unlock EVs	Charging infrastructure and solutions that remove a significant barrier to the uptake of EVs and a series of communication and policy initiatives to drive the transition away from fossil fuel vehicles.
Transform energy landscape	A network of renewables installations (likely focussing on building-and ground-mounted PV) and a series of expanded district heating networks future-proofed for zero-carbon heat sources.

Pragmatism vs positivity

Practicable Realistic Feasible

Conceivable Possible Plausible

Likely Achievable Attainable

Practical Workable Viable

Is 2030 possible?

Wrong question

Should we act to reduce emissions as quickly as possible?

Right question

Remember:

90% of progress yields 90% of benefit

(if not more!)

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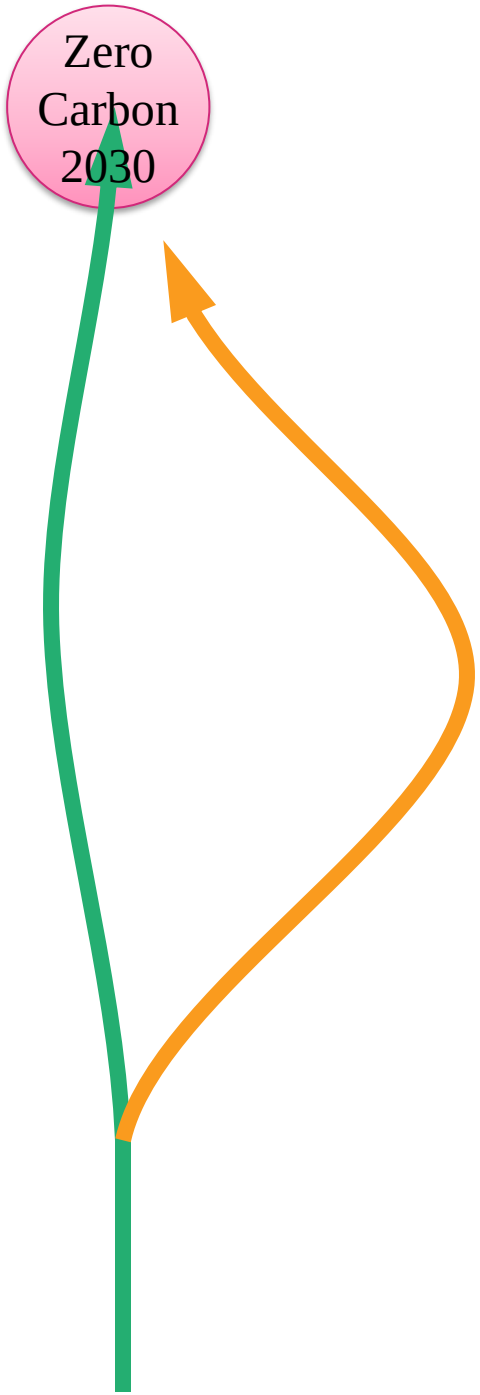
The first steps is the same



We don’t need to decide if and exactly how we’re going to make it to Zero Carbon 2030

We need to decide whether to take the first step.

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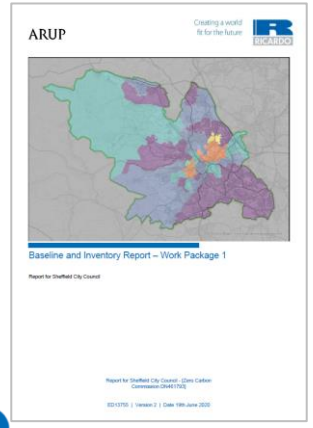
Questions?

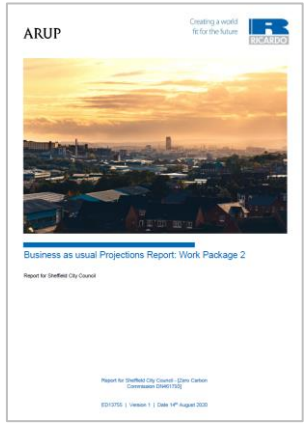
WP1
Baseline emissions

Establishing the current position



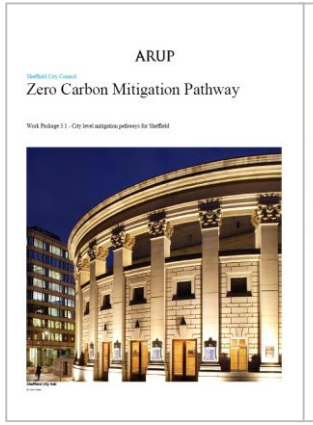
WP2
Business-as-usual projections

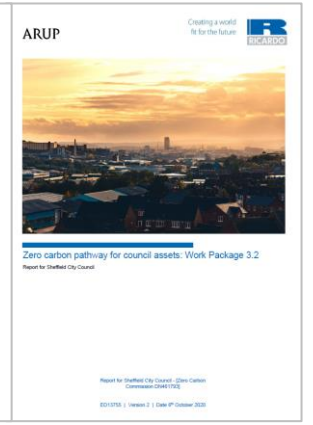
Predicting the effect of current policies



WP3
City-wide zero carbon pathway (including Council assets)

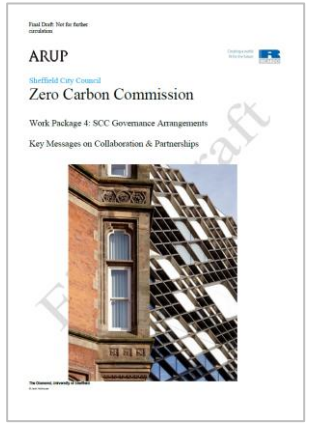
Setting out the actions that are needed to achieve zero carbon





WP4
Governance Arrangements

How the Council needs to organise itself to deliver the actions



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