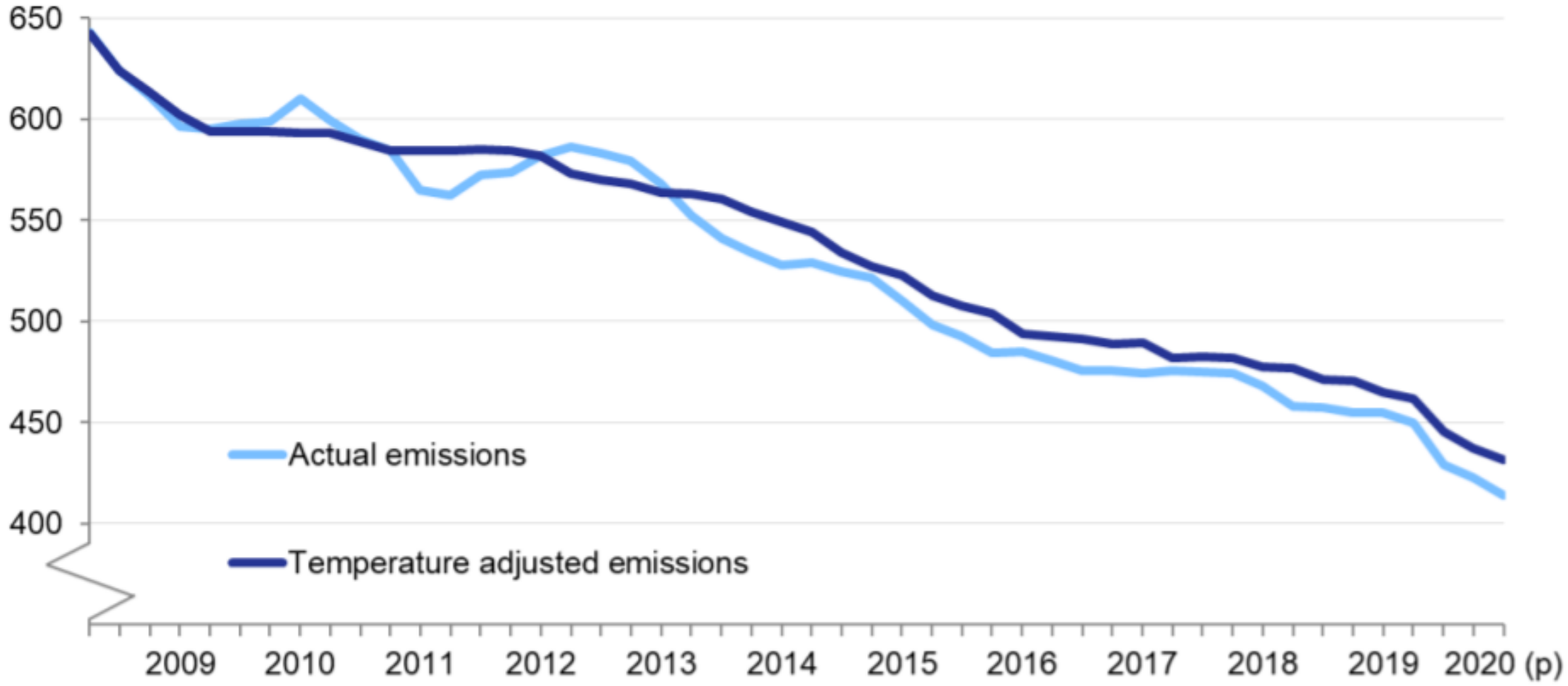
The Ten Point Plan for a Green Industrial Revolution

The plan (issued Nov 2020) focuses on increasing ambition in the following areas:

1. advancing offshore wind
2. driving the growth of low carbon hydrogen
3. delivering new and advanced nuclear power
4. accelerating the shift to zero emission vehicles
5. green public transport, cycling and walking
6. ‘jet zero’ and green ships
7. greener buildings
8. investing in carbon capture, usage and storage
9. protecting our natural environment
10. green finance and innovation

The ten point plan will mobilise £12 billion of government investment, and potentially 3 times as much from the private sector, to create and support up to 250,000 green jobs

Figure 2: Actual and temperature adjusted territorial greenhouse gas emissions, UK, Year to Q1 2009 - Year to Q4 2020 ($MtCO_2$)



Source: Tables 3 & 4, Provisional UK territorial greenhouse gas emissions national statistics 1990-2020 Excel data tables

Table 1: Percentage changes in territorial carbon dioxide emissions by sector between 2018 and 2020 based on the temperature adjusted emissions and actual emissions

	Temperature adjusted emissions			Actual emissions		
	2019 ($MtCO_2$)	2020 ($MtCO_2$)	**Percentage change**	2019 ($MtCO_2$)	2020 ($MtCO_2$)	**Percentage change**
Energy supply	92.6	84.1	**-9.3%**	89.6	79.0	**-11.9%**
Business	66.7	62.1	**-7.0%**	65.1	59.4	**-8.7%**
Transport	120.8	97.2	**-19.6%**	120.8	97.2	**-19.6%**
Public	8.3	8.4	**1.3%**	7.9	7.7	**-2.0%**
Residential	71.8	76.6	**6.7%**	66.5	67.7	**1.8%**
Other	15.1	15.0	**-0.1%**	15.1	15.0	**-0.1%**
Total CO_2	**375.3**	**343.4**	**-8.5%**	**365.1**	**326.1**	**-10.7%**

Source: Tables 3 & 4, Provisional UK territorial greenhouse gas emissions national statistics 1990-2020 Excel data tables

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Point 4: Accelerating the shift to zero emission vehicles

Andrew Webb 10th January 2022

Policy Impacts

- Carbon savings of 300Mt CO2 to 2050
- Thousands more ultra low and zero emissions cars and vans on UK roads
- Supported by additional funding for plug in vehicle grants
- Thousands more charge points in homes, workplaces, residential streets and along motorways and major A Roads

Major milestones

2030

End of sales of new petrol and diesel cars and vans

The network of charge points on England’s motorways and major A road to be extensive with more than 2,500 high powered charge points that can charge your car so it can drive over 100 miles, all in the time in the time it takes to have a cup of coffee

2035

All new cars and vans will be zero-emission from the tailpipe leading to cleaner, greener vehicles on UK roads. England’s motorways and major A roads will have around 6,000 high powered charge points

Audience survey

- How many here currently own or use a battery electric vehicle or hybrid?
- How many here plan to buy or lease a battery electric vehicle?
- How many here would not move to zero emission vehicles?

(In spite of the government banning the sale of petrol and diesel cars from 2030 and hybrids from 2035)

Electric Vehicles more expensive than ICE equivalent

- Small EV £328 per month lease vs £207 equivalent petrol or diesel
- Small EV insurance £233 per year vs £190 for ICE car

but…..

- 10,000 miles per year costs £200 in electricity vs £1600 for petrol
- Servicing cost of EV lower than equivalent ICE car
- EV road tax is zero
- Benefit in kind (BIK) for EV is 1%

My experience of owning an EV

- Range anxiety?

Most journeys (>95%) are under 10 miles. EV (e-golf) has 150 mile range.

Use home charging point once a week. More convenient than filling up at Tesco

Long journeys use rapid charger. Adds 100 miles in 20 minutes.

but …….

Need to plan long journeys for stops at charging stations

Can be a queue waiting for charger……

Risks to government policy

- Infrastructure growth too modest in ambition
  - Currently 46,637 chargers in 17,368 locations (slow, fast, rapid, ultra)
  - Of these only 5,000 rapid chargers at 3,165 locations
  - Currently 345,000 battery electric vehicles on the road
  - 24,537 new EV registrations in October 2021 (16,155 zero emissions)
  - Market share for EV is 23%. That’s 88% growth YTD 2021 over 2020!

The good news….

- First electric forecourt opened in Braintree, Essex by Gridserve
- Arup and Gridserve JV plan to open 100 electric forecourts in 5 years
    - 24 charging points at each forecourt
    - 12 superchargers
    - 36 vehicles can charge simultaneously
    - 200 miles range in 20 minutes
    - solar farm at each forecourt with 6MWH battery

After discussion and questions…

- Of those who said they wouldn’t buy an EV how many may now reconsider?
- Do we think the government policy is too modest and the private sector will come through (not with vehicles but with infrastructure to support growth)?

Ten Point Plan for a Green Industrial Revolution

Point 5 -Green Public Transport, Cycling and Walking

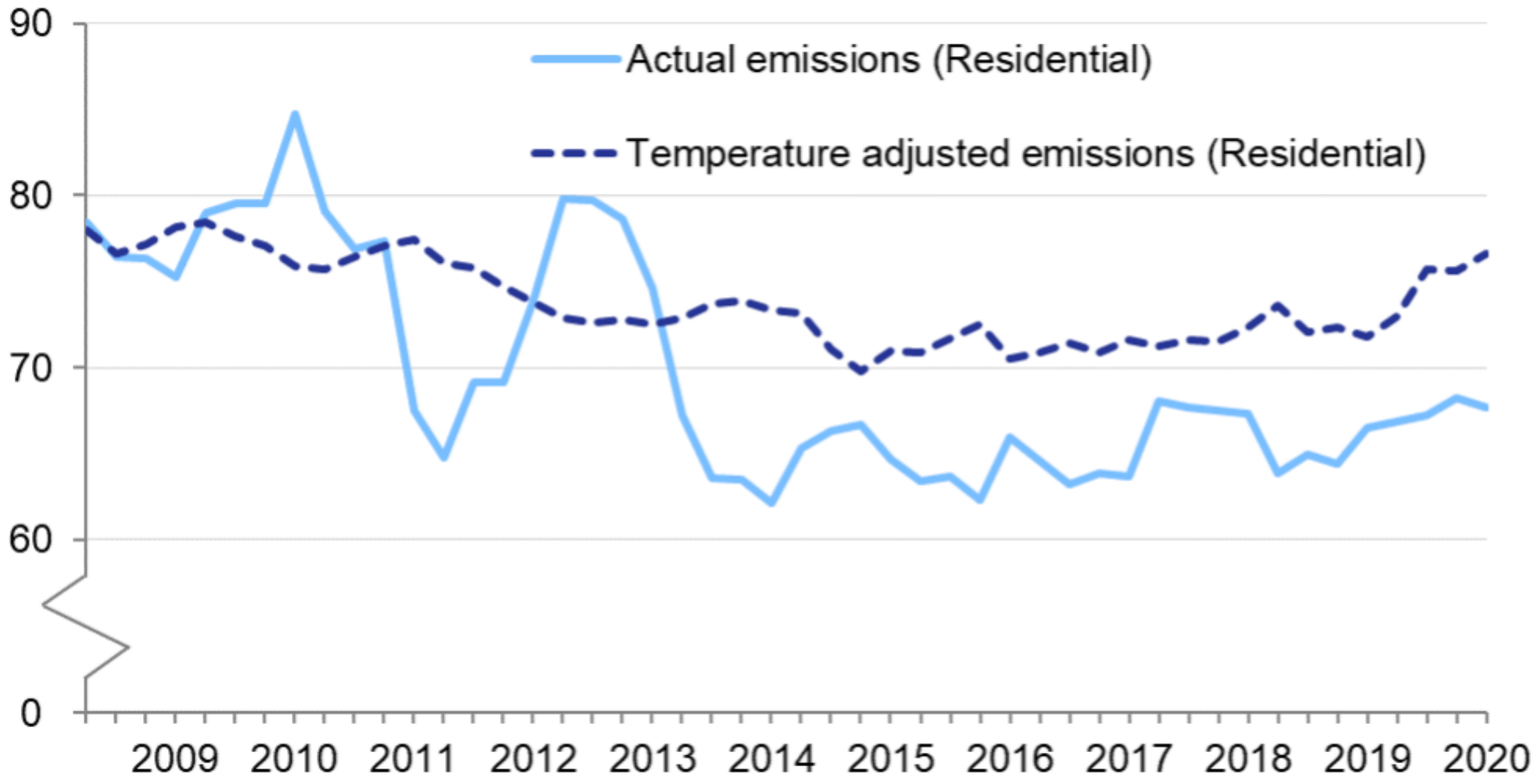
Peter Phillips

Ten Point Plan for a Green Industrial Revolution

Point 7 - Greener Buildings

Geoff Pettinger

Figure 8: Actual and temperature adjusted residential carbon dioxide territorial emissions, UK, Year to Q1 2009 - Year to Q4 2020 ($MtCO_2$)



Point 7 - Greener Buildings

The Government says developing greener buildings could deliver…

- support for around 50,000 jobs in 2030
- around £11 billion of private investment in the 2020s
- savings of 71 MtCO2e between 2023 and 2032

Policy impacts

- we are setting an ambition of 600,000 heat pumps installations per year by 2028
- homes built to the Future Homes Standard will be ‘zero-carbon ready’ and will have 75–80% lower carbon dioxide emissions than those built to current standards
- our green home finance initiatives could help to improve the energy efficiency of around 2.8 million homes, improving around 1.5 million to EPC C standard by 2030

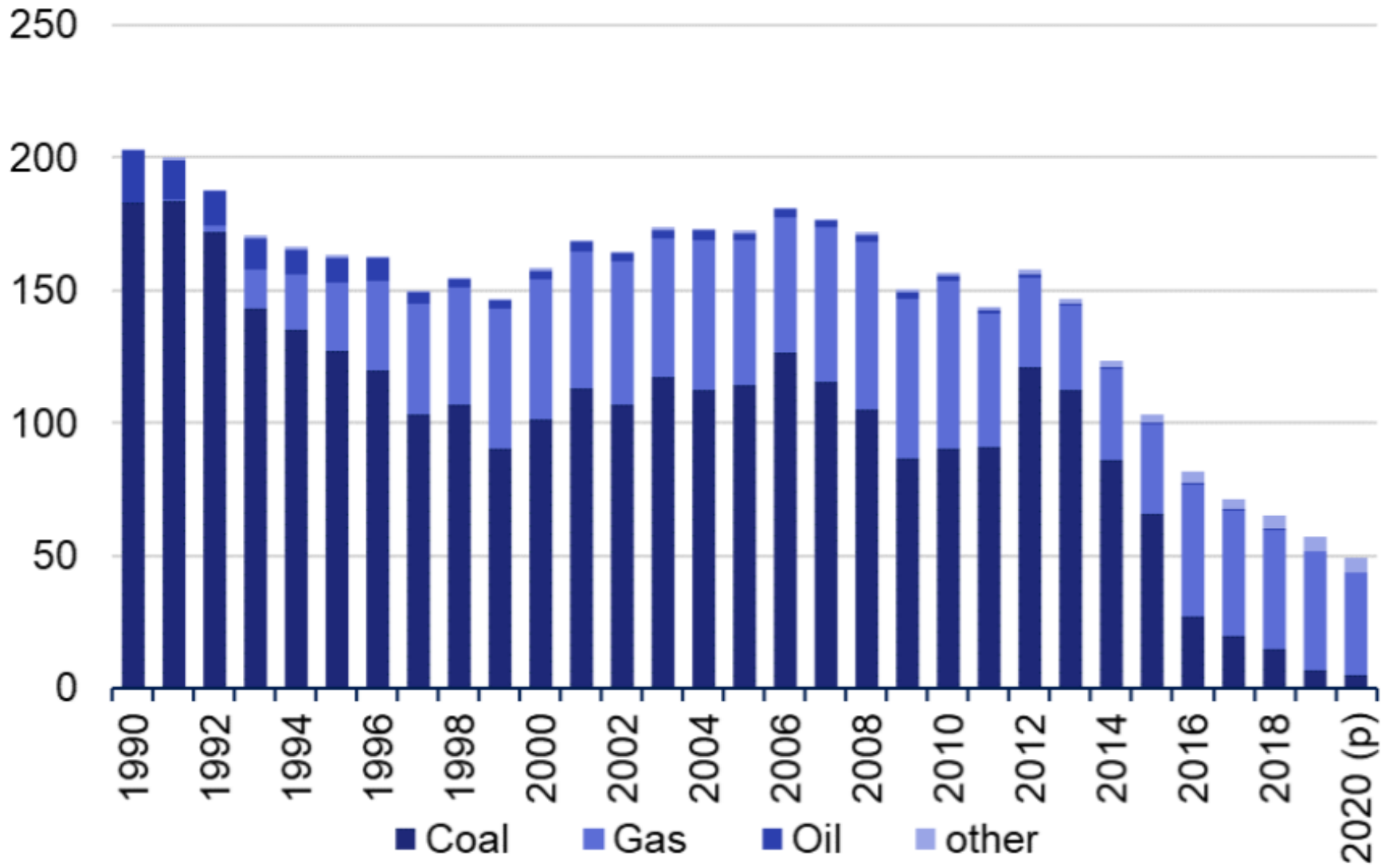
Target milestones

- 2021: Set out our Heat and Buildings Strategy. **Net Zero Strategy Published Nov 2021**
- 2021: Launch a world class energy related products policy framework. **Out for consultation**
- By 2032: Ensure that the public sector has reduced its direct emissions by 50% compared to a 2017 baseline

Net Zero Strategy: Build Back Greener - Oct 2021
Heat & Buildings

- By 2035, once costs have come down, all new heating appliances installed in homes and workplaces will be low-carbon technologies, like electric heat pumps or hydrogen boilers. We will take a decision in 2026 on the role of hydrogen heating
- An ambition that by 2035, no new gas boilers will be sold.
- A new £450 million three-year Boiler Upgrade Scheme will see households offered grants of up to £5,000 for low-carbon heating systems so they cost the same as a gas boiler now.
- A new £60 million Heat Pump Ready programme that will provide funding for pioneering heat pump technologies and will support the government's target of 600,000 installations a year by 2028.
- £1.75 billion funding for the Social Housing Decarbonisation Scheme and Home Upgrade Grants. Additional funding of £1.425 billion for Public Sector Decarbonisation, with the aim of reducing emissions from public sector buildings by 75% by 2037.
- Launching a Hydrogen Village trial to inform a decision on the role of hydrogen in the heating system by 2026.

Figure 4: Territorial carbon dioxide emissions from power stations, UK, 1990-2020 ($MtCO_2$)



Source: Tables 1 & 2, Provisional UK territorial greenhouse gas emissions national statistics 1990-2020 Excel data tables

Note: (p) 2020 estimates are provisional.

Age of dwellings in England in 2019, by tenure

(in 1,000s)

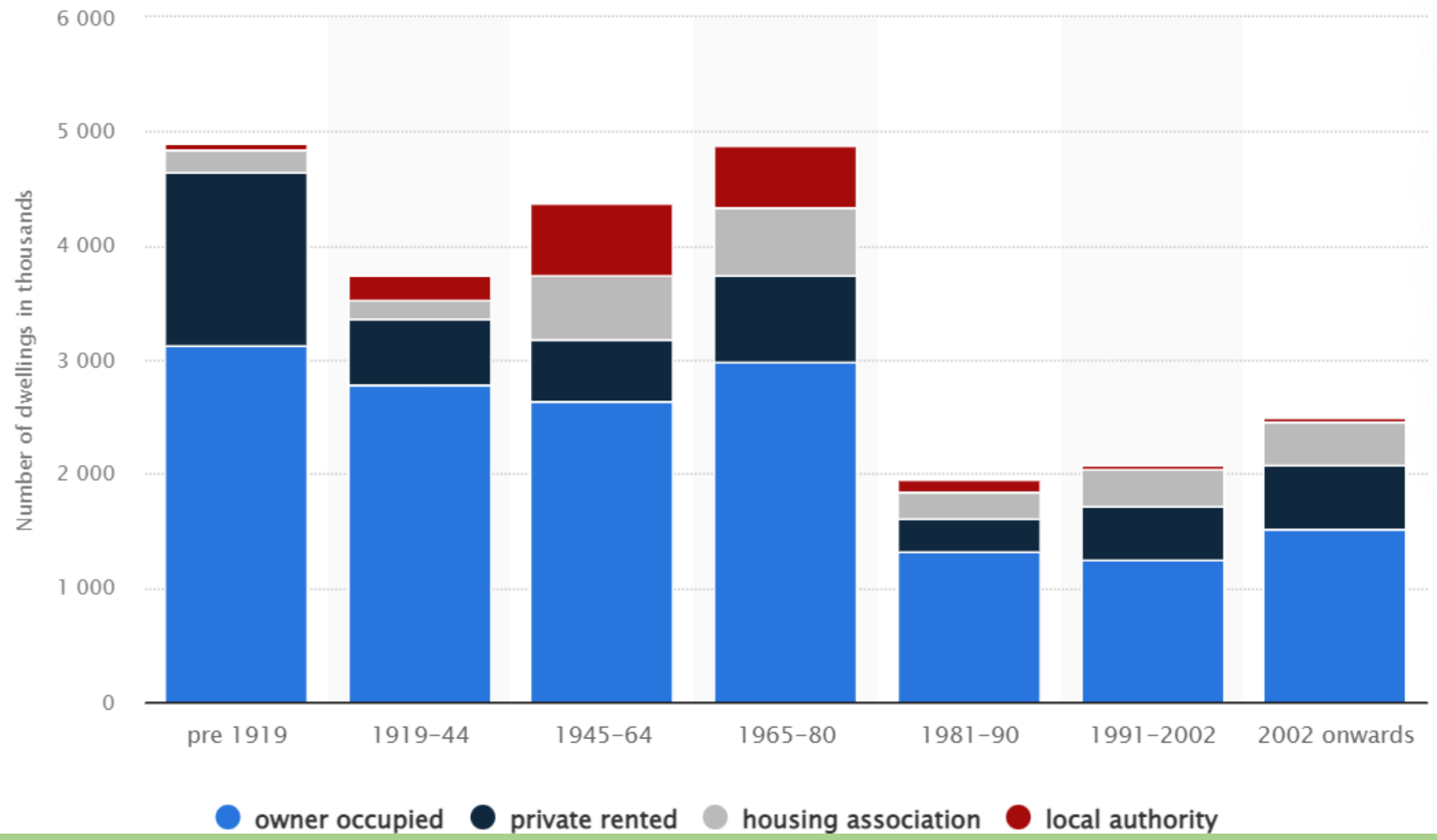


Figure 9: CO2 emissions are far higher for existing dwellings than new dwellings

Median estimated CO2 emissions, for new and existing dwellings, English regions and Wales, up to March 2021

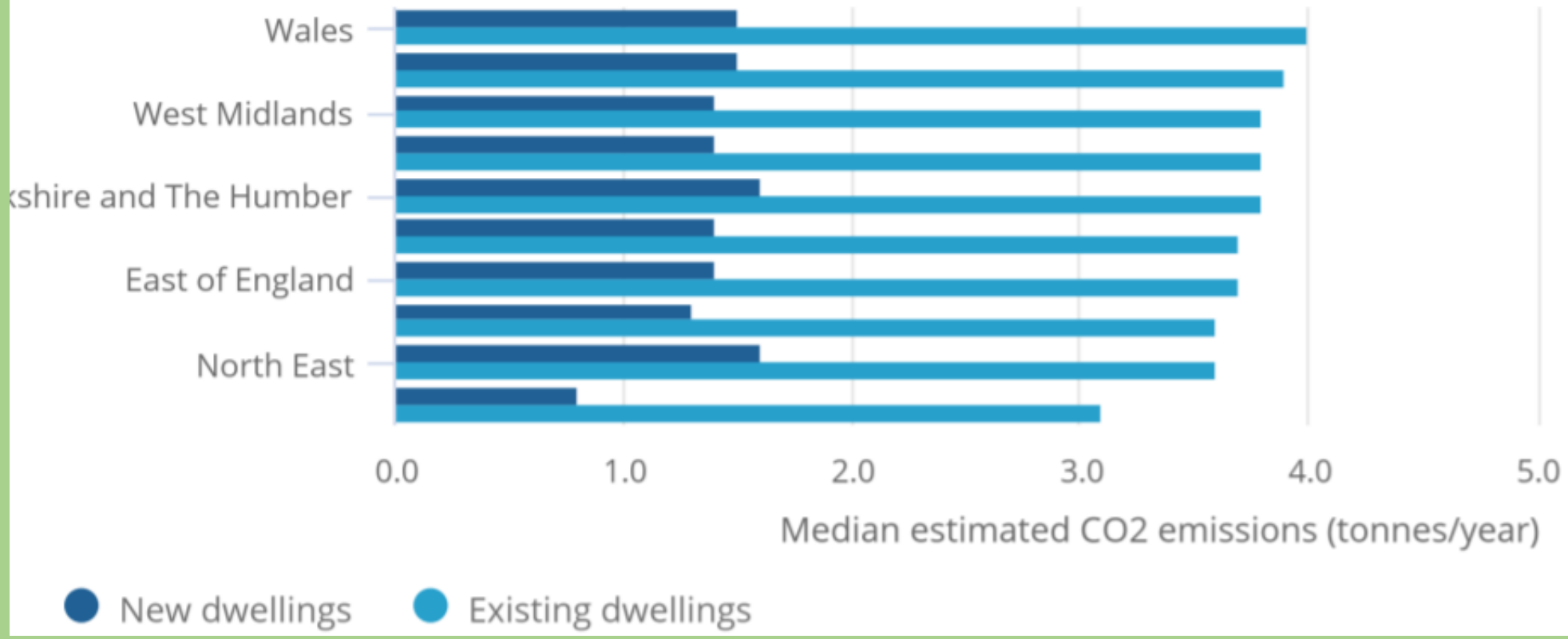


Figure 4: Dwellings that were constructed more recently had higher median energy efficiency scores than older dwellings

Median energy efficiency score, by property age, England and Wales, up to March 2021

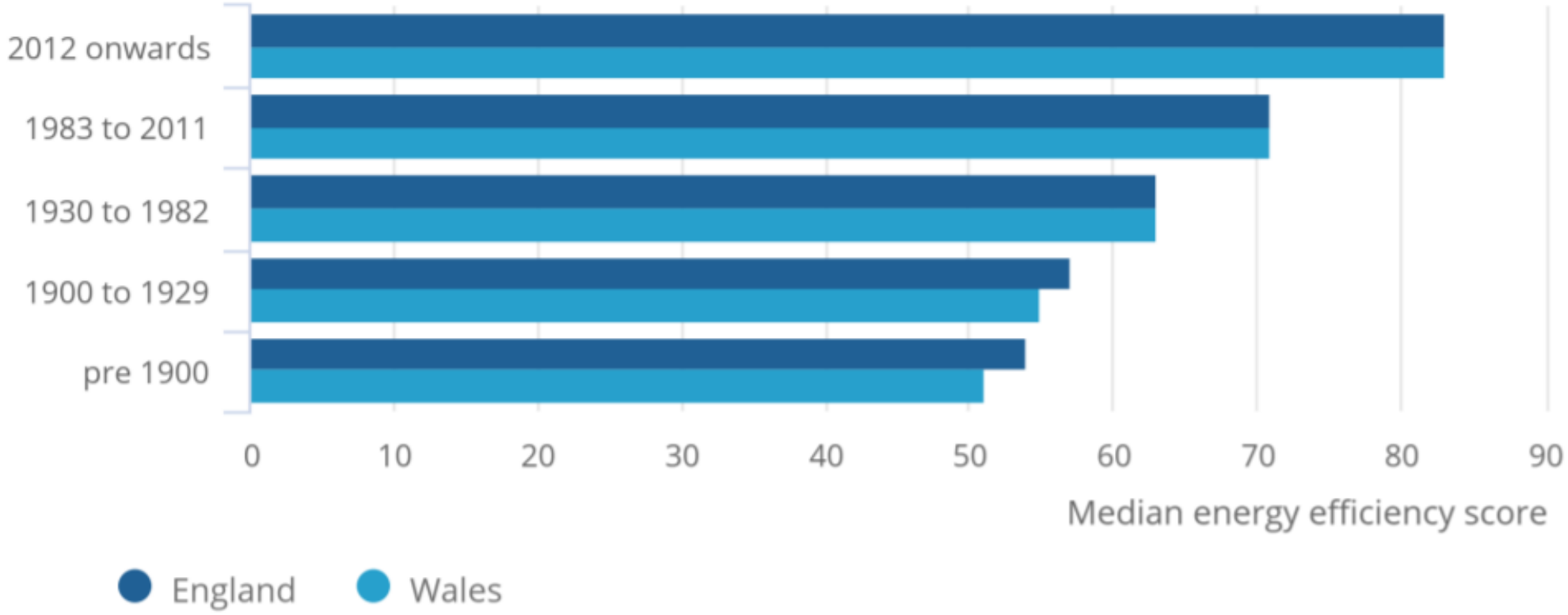
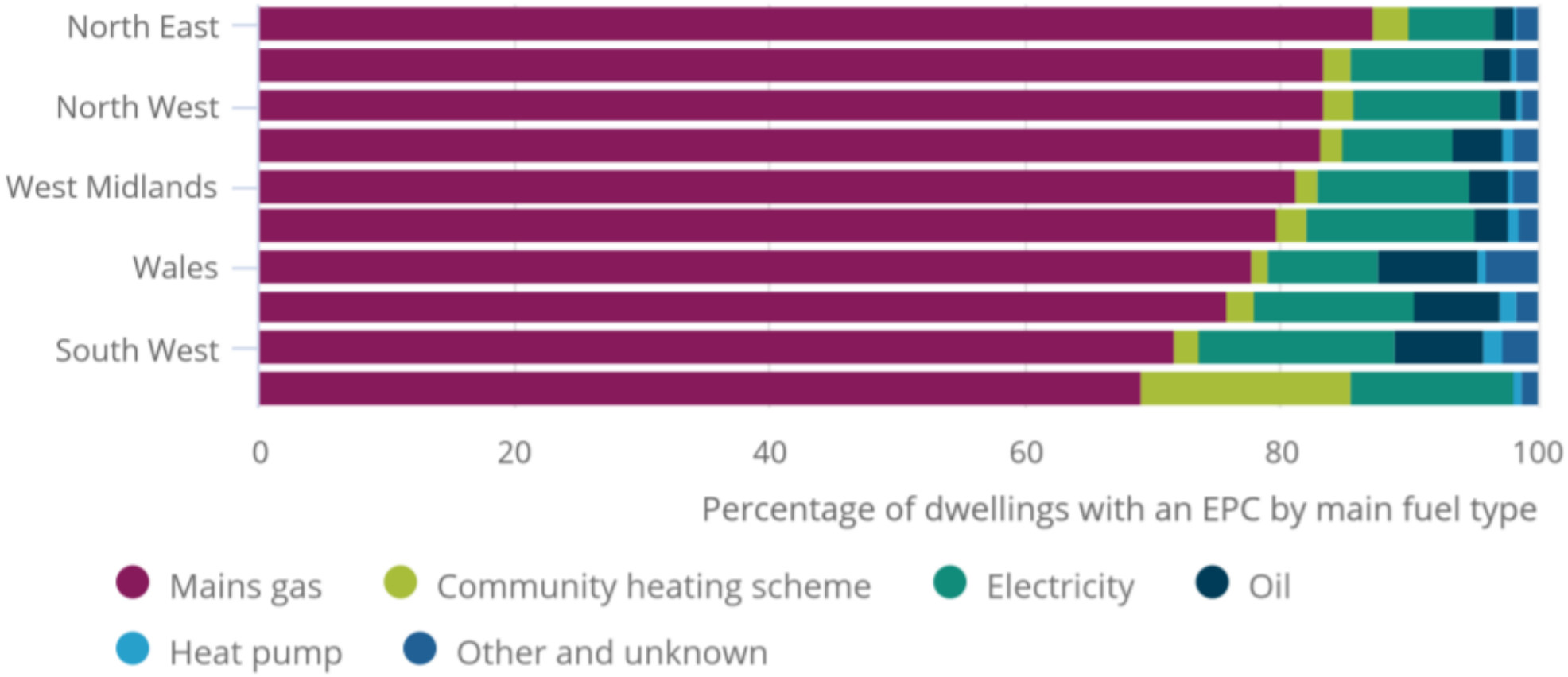


Figure 6: Mains gas was the most common source of central heating fuel in all English regions and Wales

Main fuel type used in central heating, English regions and Wales, up to March 2021



Are Heat Pumps the Answer for Heating?

- Average household annual consumption

  Gas 18,000kWh Electricity 5,000kWh

Heat pump CoP is 3 i.e. delivers 3 kWh of heat per kWh of electricity

CO_2 per kWh (2020)	Gas 0.25kg	Electricity 0.23kg
Annual emissions of CO_2	Gas boiler 4500kg	Heat pump 1380kg

Typical gas boiler heat output for older house is 12kW or a 4kw heat pump.

Without substantial reduction in heating load (desirable) this will be unsupportable from current grid. Local generation and/or storage would be beneficial.

Renewables are subject to low output in winter at a time of maximum demand

A heat pump dependant on renewables will need significant (local or grid) electricity storage to cope with variations in generation and demand.

ANY QUESTIONS?

Point 8: Investing in carbon capture, usage and storage

Barry Hayden