



Achieving Net Zero

Presentation to North Northamptonshire Council
Executive Advisory Panel
from Electric Places (Electric Corby CIC)

Nick Bolton
Peter Stevens



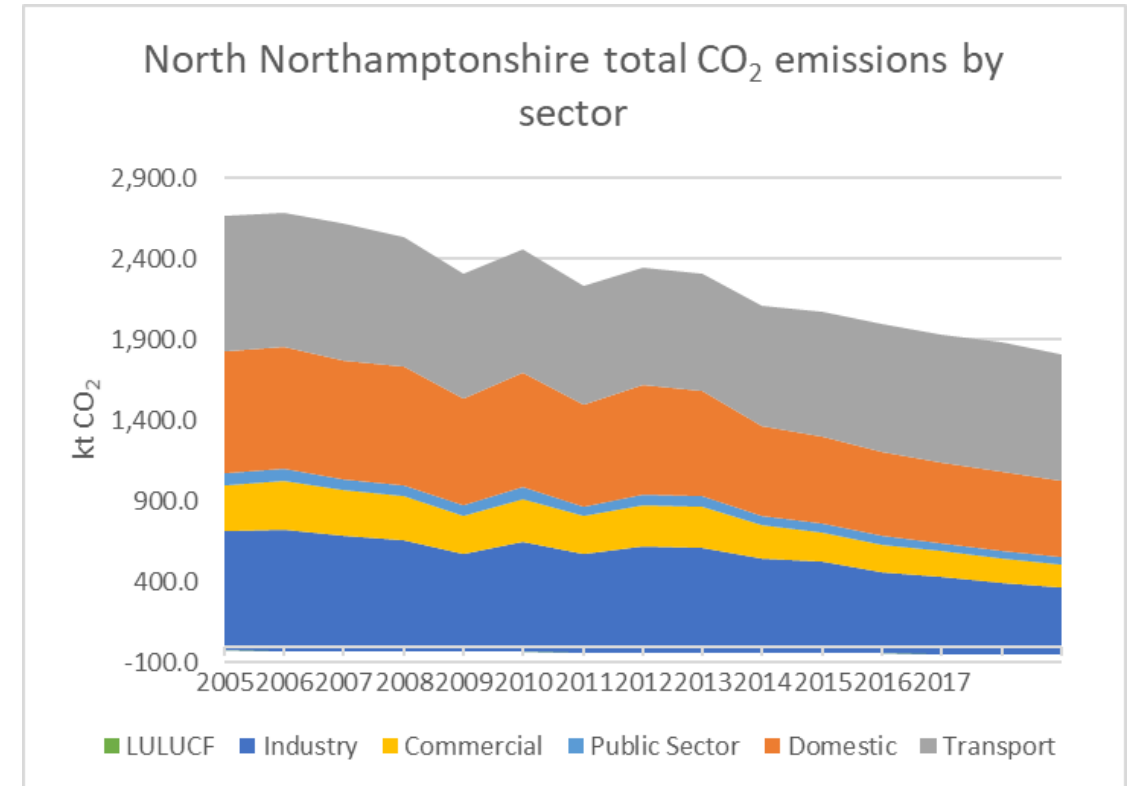
Agenda

1. North Northamptonshire to Net Zero – background & objectives
2. Call for Ideas
3. Ideas, projects, initiatives and interventions assessed
4. Top 10 ideas for individuals
5. Draft gap closed for North Northamptonshire
6. Strategic Options – Future Pathways
7. Options for a Programme of Actions and Interventions
8. Benefits and Challenges
9. Delivery and Stewardship
10. Summary and Next Steps

Project NN2NZ

North Northamptonshire to Net Zero

- UK Parliament declared a climate emergency in 2019, along with goal of being net zero by 2050. Many are trying to beat this. Emissions are coming down, but significantly more needs to be done to reach net zero.
- NN2NZ aims to develop and recommend a programme of initiatives that would enable NN to reach Net Zero ahead of 2050, along with a robust framework for assessing new ideas as they emerge
- Follow-on funding for trialling and roll-out of the key initiatives will be sought to enable success for NN

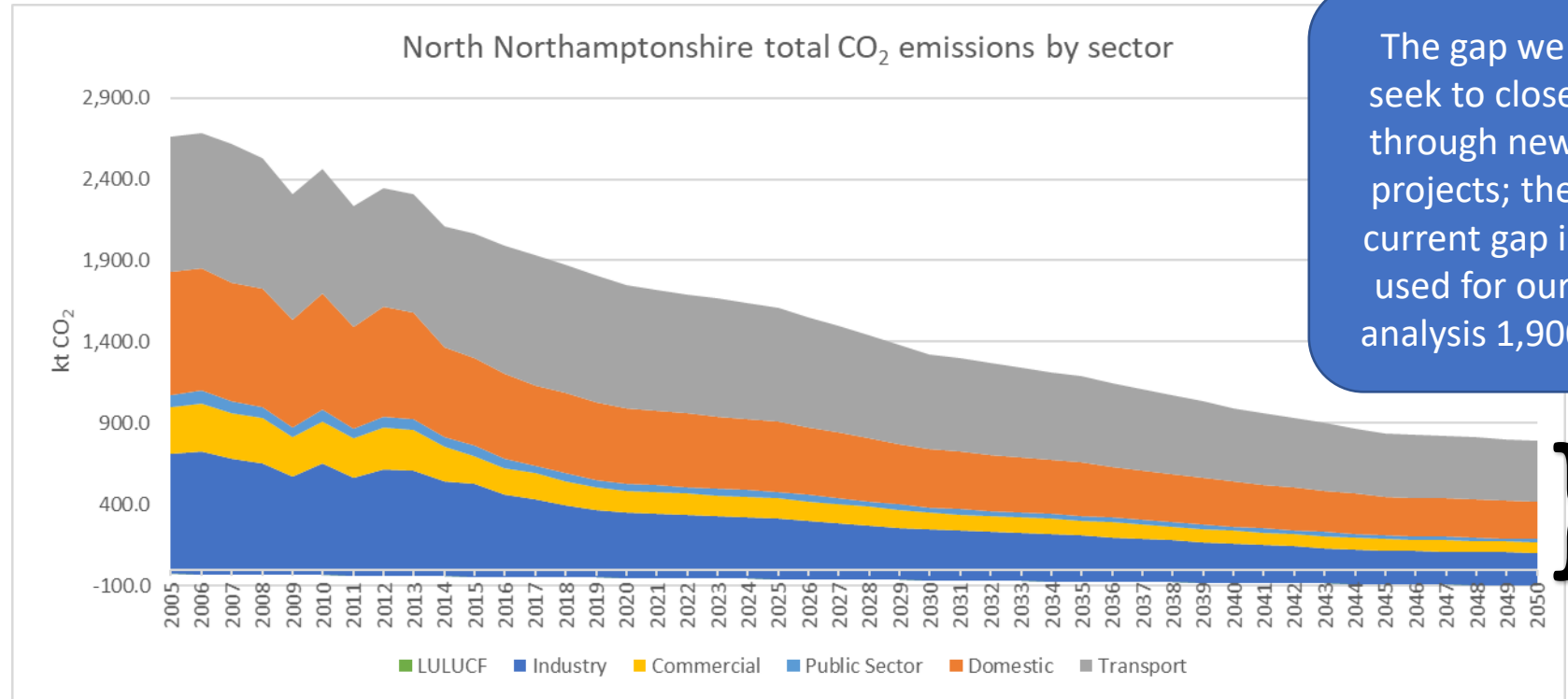


How to close the gap

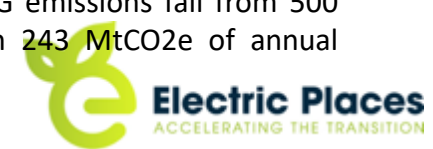


>8000 projects analysed and looking for more – no stone to be left unturned

- The forecast scale and impact of all viable projects is being added to this gap analysis to see out how far they go to net zero until we reach a roadmap to net zero that is considered feasible.
- We will recommend the resulting projects to be added to the roadmap and for their roll-out to be supported



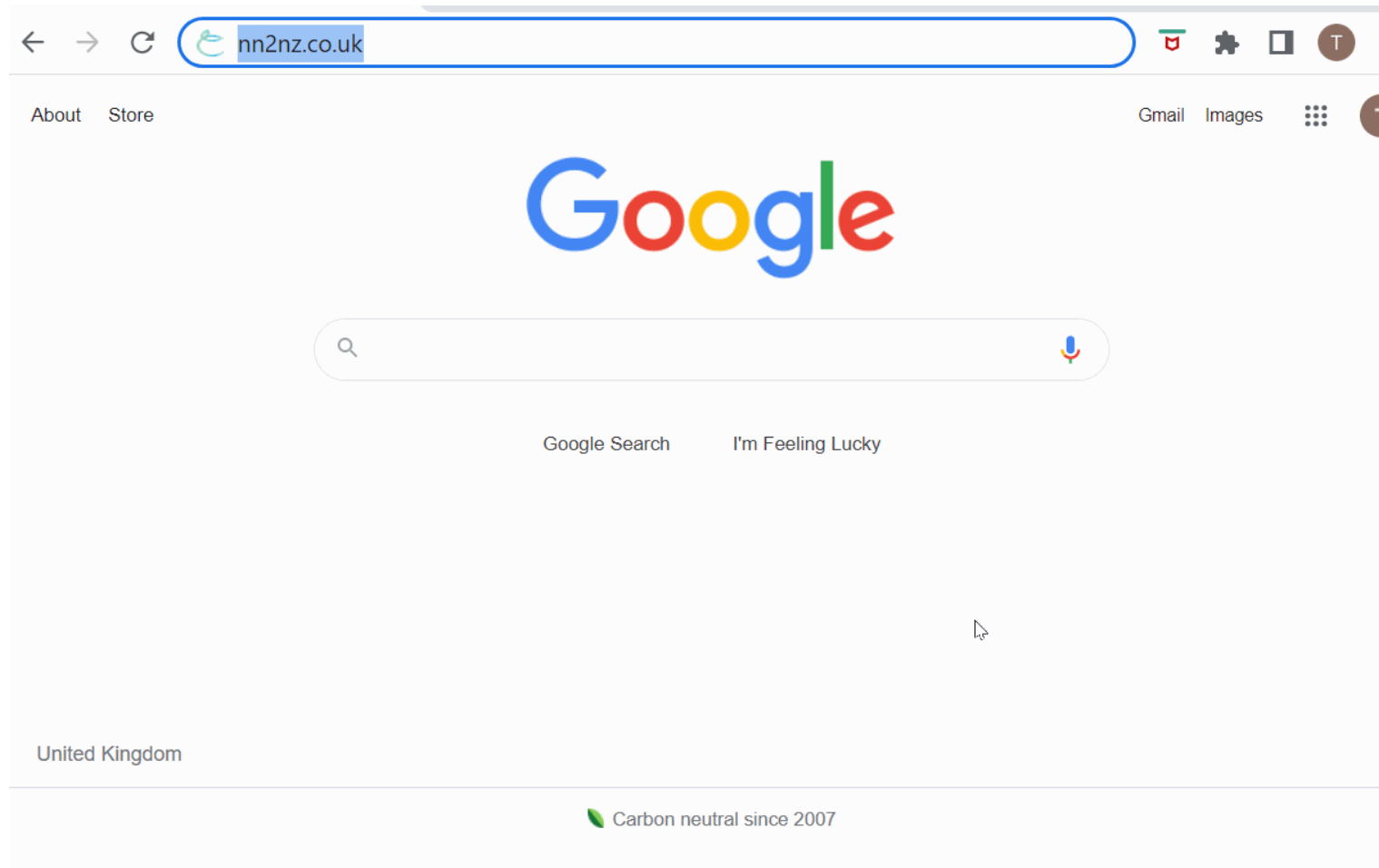
Forecasted BAU emissions are based on National Grid Future Energy Scenario (FES) “Steady Progression”, 2021). This represents a base case decarbonisation profile for North Northamptonshire. Under the Steady Progression scenario net GHG emissions fall from 500 MtCO₂e in 2020 and do not reach net zero by 2050 resulting in 243 MtCO₂e of annual emissions by 2050.



Open call for new ideas

www.nn2nz.co.uk

“Taking North Northamptonshire to net Zero”





Broad blue sky search for solutions

What if.....

every south-facing roof had solar

every car park had solar and wind

every building was fully insulated and converted to ASHP

people gave up their second cars

no-one drove to work

everyone in town walked everywhere

every verge was planted with trees

everyone turned vegetarian

people only used efficient slow cookers

everyone switched to LED bulbs

no-one boiled more than they needed in the kettle



CO₂ reduction



CO₂ offsetting



Infrastructure



Behaviour



Small scale



Large scale



Past projects, ongoing initiatives and new project ideas



Top 10 for individuals



Top 10 options for reducing your carbon footprint

1		2.04	Live car-free
2		1.95	Battery electric vehicle
3		1.68	One less flight (long-haul return)
4		1.6	Renewable electricity
5		0.98	Public transport
6		0.895	Refurbishment and renovation
7		0.8	Vegan diet
8		0.795	Heat pump
9		0.65	Improved cooking equipment
10		0.64	Renewable-based heating



Closing the Net Zero Carbon Gap - Summary Draft



“Gap Closed” for NN2NZ

Rank	% impact		Mitigation (tCO2eq/cap pa)	NN total impact (tCO2e pa)	% take-up	Rank	% impact		Mitigation (tCO2eq/cap pa)	NN total impact (tCO2e pa)	% take-up
	35.2%	ENERGY					16.9%	FOOD FARMING & FORESTRY			
17	2.1%	Solar PV on every roof	0.75	57,273	60%	12	1.2%	If 10% of people become vegans (up from 1% today)	0.91	31,760	10%
53	7.5%	Solar PV car port canopies on every car park	0.03	200,152	60%	22	1.4%	If a further 20% of people became vegetarians (up from 11% today)	0.52	36,119	20%
53	6.3%	Small scale 10m wind turbines on every park above the solar canopies	0.03	166,793	50%	28	1.1%	If a further 20% of people shifted to fish and plant based diet (no red meat)	0.42	29,551	20%
19	0.4%	Earth bank thermal solar seasonal heat storage and heating for new housing	0.68	9,521	50%	24	1.3%	If a further 20% of people cut down on red meat by 50%	0.48	33,536	20%
3	11.0%	green the grid - homes buy 100% renewable energy from grid	7.38	293,654	30%	35	0.4%	If a further 10% of people reduced their food intake, to just what they needed	0.30	10,555	10%
36	2.0%	Personal domestic home efficiencies - only heat/boil the water you need	0.30	52,158	50%	32	0.8%	Leaving 20% of people who will not change except from reducing wasted food to cut bills	0.32	22,347	20%
20	3.6%	Improved cooking equipment - more efficient cooking	0.55	96,332	50%	30	0.5%	If 10% of people grew their own vegetables	0.36	12,688	10%
44	0.9%	Lower room temperature	0.14	24,337	50%	27	1.2%	And 20% of people only bought locally grown food (requiring a supply chain shift)	0.44	30,945	20%
48	0.5%	Less energy use for washing clothes	0.07	12,794	50%	40	0.5%	And further 20% of people only ate seasonal fresh food and froze less	0.21	14,288	20%
52	0.2%	Better use of appliances (only switch on when needed)	0.04	6,137	50%	25	6.1%	If fossil fuel fertilisers were banned so everyone ate organic food	0.47	164,028	100%
46	0.7%	Shift to more efficient appliances	0.11	18,686	50%	56	0.8%	Planting Rockingham forest	0.02	22,000	100%
						56	1.6%	Planting every roadside verge with trees	0.02	43,482	90%
	34.8%	TRANSPORT				56	0.0%	Planting trees around every new development (@ 1 tree per home)	0.02	616	100%
6	3.2%	20% of cars and vans are electric by 2030	2.01	86,465							
18	1.2%	20% are hybrids	0.73	31,374			9.0%	BUILDINGS			
29	0.7%	20% have shifted to smaller vehicles	0.42	18,191		41	2.4%	Better insulation of existing roofs (homes)	0.20	63,433	90%
15	0.7%	50% of households who own more than one car (36%) give up their second car	0.77	18,460		42	1.3%	Better insulation of existing walls (homes)	0.17	35,878	60%
5	2.1%	Those households with no cars/vans doubles from 20% to 40%	2.10	55,655		45	0.7%	Full thermal insulation of houses (New sealings, ventilation, additional façade & roof insu	0.11	19,674	50%
33	2.0%	Those who keep their car share through lifts for school runs and regular commutes	0.32	52,361		21	0.6%	All new homes insulated to passive standards	0.54	15,052	100%
6	8.3%	90% of non-EVs switch to electric by 2040, as most vehicles replaced in 10 years	2.01	220,232		51	0.0%	Low carbon construction methods for all new buildings	0.05	1,306	100%
9	0.7%	Leaving 10% as ICE cars, switch to green e-fuels	1.44	17,543		16	2.5%	All gas-heating switched to ASHPs.	0.75	66,881	80%
4	0.7%	Other vehicles switch to green e-fuels	5.30	17,490		8	0.2%	All oil-fired heating switched to ASHPs	1.75	5,822	80%
2	0.6%	Remaining buses switch to green e-fuels	38.88	15,551		49	0.1%	solar thermal heating of water	0.07	2,885	30%
1	14.6%	Remaining trucks switch to green e-fuels	138.91	388,942		31	1.1%	Co-housing. 95% of homes occupied and 50% of 51% spare space occupied	0.34	30,013	25%
38	0.1%	and engage in more fuel efficient driving	0.28	2,768							
10	0.1%	Switch to public transport	0.99	2,426			4.0%	INDUSTRY/COMMERCE			
14	0.1%	Switch to walking & cycling	0.79	1,922		37	0.2%	Material efficiencies	0.29	4,584	100%
						39	0.1%	Energy Management systems driven efficiencies	0.23	3,636	100%
						26	0.7%	All those who can work from home should – 1/3 people’s jobs can be done from home.	0.44	18,729	80%
						13	0.1%	Similarly, business travel should be discouraged – business travel should be cut in half	0.83	3,291	50%
						23	1.3%	People should be encouraged to share, re-use and upcycle & commerce incentivised	0.52	35,993	20%
						11	0.2%	Existing buildings refurbished rather than re-built where possible.	0.93	4,411	30%
						47	0.3%	Plastics should be designed out of new goods, and always recycled from waste.	0.08	7,914	30%
						43	0.6%	Less packaging should be used	0.16	16,724	30%
						50	0.2%	Better council recycling of waste is recycled & carbon capture & methane to energy	0.06	6,012	30%
						55	0.1%	The council needs to recycle organic waste, so as much as carbon is recycled as possible	0.03	2,823	30%
		TOTAL FORECAST		2,664,194							
		CURRENT CO2		-1,900,000							
		NET POSITION		764,194							

Feasibility Studies

Although these 'draft gap closed' initiatives could get us to net zero, we need to validate their feasibility for our area before recommending them:

1. Data triangulation & validation
2. Digital twin for mapping the impact of different uptake scenarios geo-spatially across NN
3. Feasibility of carpeting NN car parks and buildings with solar and wind
4. Feasibility of developing large-scale energy storage capabilities
5. Potential of local energy communities and micro-grids, including a pilot with Sitigrid
6. Feasibility and impact of replacing fossil fuel with clean e-fuels, especially for older vehicles, trucks and buses
7. Extent to which existing buildings can be retro-fitted with impactful insulation
8. Feasibility and relevance of carbon capture technologies for carbon offsetting any remaining gaps in NN
9. The potential benefit of mobility hubs across NN
10. The right EV strategy for NNC
11. Framework for overcoming electricity grid network constraints in NN
12. Framework to support developers build net zero homes
13. The potential role of a local net zero community fund to seed and generate meaningful changes across NN local communities
14. Pro-business pro-growth strategies for upskilling and generating new local jobs to deliver net zero change commercially

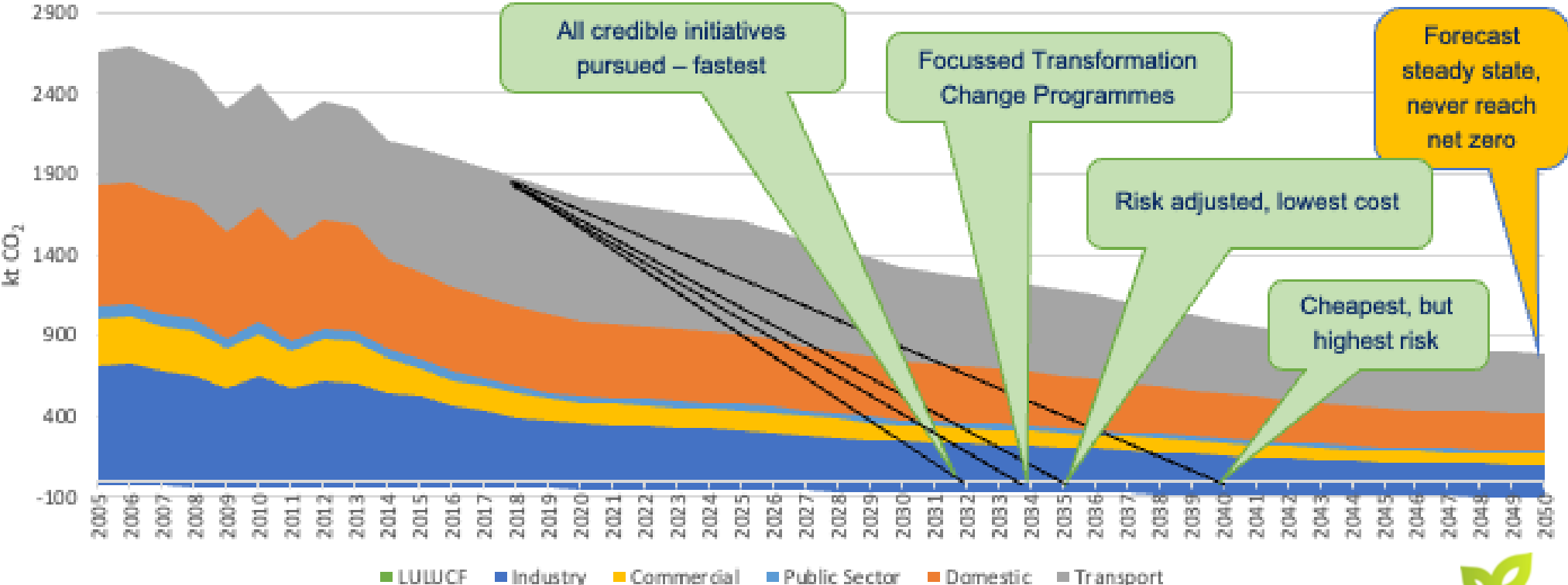
Digital Twin

- A dynamic 3D place model and collaborative platform, brings together data from various agencies and other sources and includes static, dynamic, and real-time data and information such as demographics, movement and climate
- Planners can visualise the effects of constructing new buildings, installing green roofs or transport infrastructure – from CO₂e to flood risk
- A tool for stewardship and progress review
- A pilot model for North Northamptonshire is progressing

Strategic Options - Future Pathways

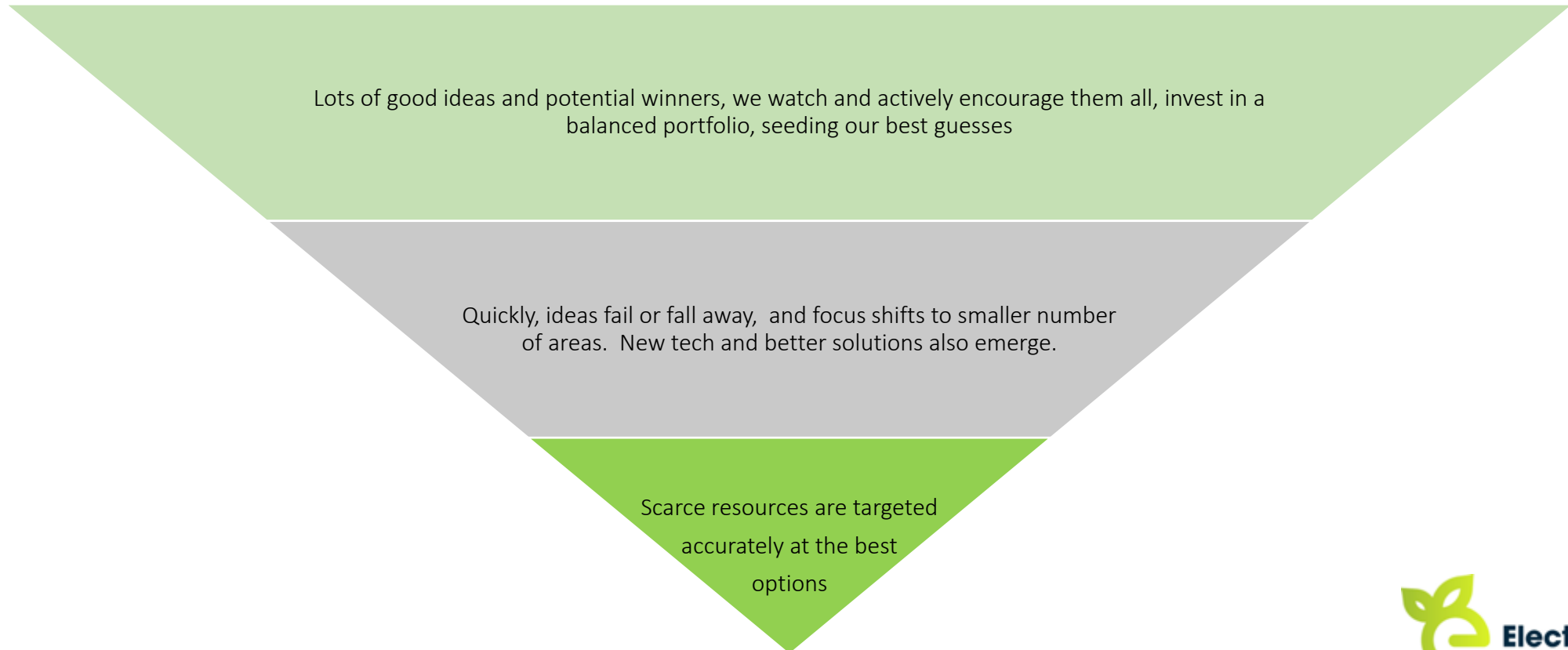
Once validated, we then need to determine the best pathway there – from **(1)** going as fast as we can, which could deliver net zero as early as 2032, but cost the most; to **(2)** the cheapest route, but this is the slowest and has the most risk of failure; or **(3)** focused change transformation programme option, selecting those initiatives with the greatest potential; through to **(4)** a risk-adjusted blend, that aims to deliver the most with the least budget and lowest risk.

North Northamptonshire total CO₂ emissions by sector - strategic options to net zero



Risk-adjusted lowest cost approach

It is hard to predict winners and losers, and therefore a risk-based approach supports the full range of initiatives in the early years, watching until the winners emerge, when we then focus in on these to reach net zero in the shortest time with the least risk, and lowest cost with least waste. As new and better tech emerges, we RAG rate them, and add those that can support net zero to the mix. Support will differ by socio-demographics and where the tech is on the adoption curve (e.g. incentives for early adopters, penalties for laggards)



Domestic Buildings

Industrial and Commercial (I&C) buildings are dealt with separately

Initiative	Saving tCO2e /capita pa	Annual Take-up Growth Assumption	2025 tCO2	2030 tCO2	2035 tCO2	2040 tCO2	2050 £ benefit	cumulative benefit	investment cost
All gas-heating switched to ASHPs.	0.753	3%	7524	20064	32604	45144	£28,089,910	£407,303,699	£933,055,200
Better insulation of existing roofs (homes)	0.202	4%	2819	7517	12215	16913	£10,523,389	£152,589,143	£38,994,690
Better insulation of existing walls (homes)	0.172	4%	2391	6377	10363	14349	£8,928,088	£129,457,282	£77,989,380
Co-housing. 95% of homes occupied and 50% of 51% spare space occupied	0.345	1%	1372	3658	5944	8231	£5,121,282	£74,258,596	£0
Full thermal insulation of houses (Sealings to reduce ventilation, additional façade & roof insulation, new windows)	0.113	3%	1349	3597	5845	8093	£5,035,599	£73,016,183	£1,336,960,800
All oil-fired heating switched to ASHPs	1.753	4%	764	2038	3311	4584	£2,852,557	£41,362,073	£40,689,600
solar thermal heating of water	0.073	1%	289	769	1250	1731	£1,077,102	£15,617,985	£185,689,000
All new homes insulated to passive standards	0.538	100%	753	753	753	753	£301,037	£7,826,952	£16,800,000
Low carbon construction methods for all new buildings	0.047	100%	0	65	65	65	£26,129	£548,712	£0

Programme Options for Buildings

Better Buildings

- Better Efficiency
 - Insulation
 - Control
 - Education to inform decisions
- Better Systems
 - Switching from Fossil Fuel to Electric
 - Generate Electricity and heat on or near buildings
- Better New Build
 - Programme for Planners, Architects, Developers, Builders
 - Net Zero Literacy
 - Solutions Updates
 - Case Studies and Best Practice
 - Strong, clear policy on Embodied and Operational Net Zero Target
 - Holistic assessment and plans for new build



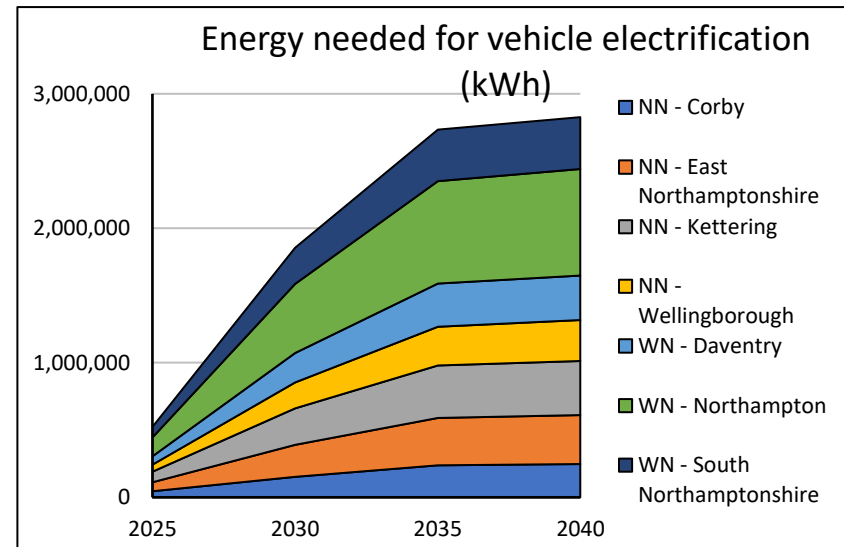
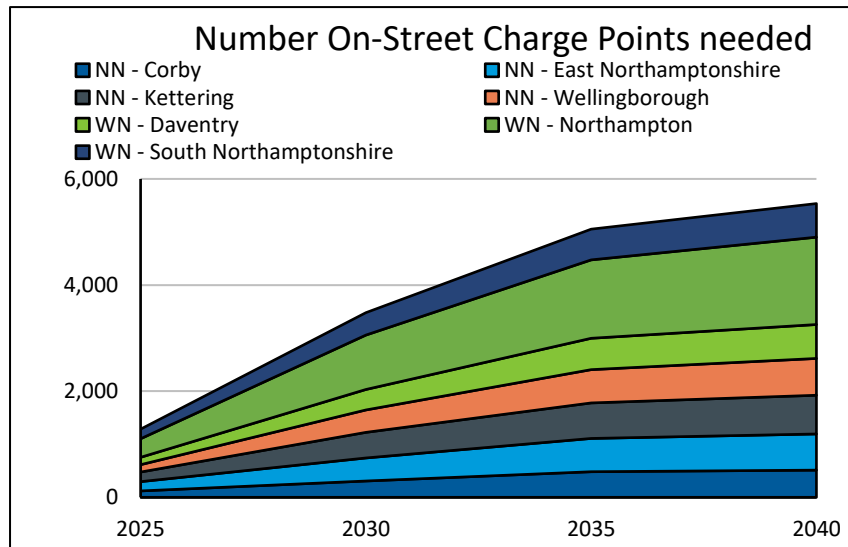
Existing and New Build

Transport

Initiative	Saving tCO2e /capita pa	Annual Take-up Growth Assumption	2030 tCO2	2035 tCO2	2040 tCO2	2050 £ benefit	cumulative benefit	investment cost	Potential public cost / support
Remaining ICE trucks switch to green e-fuels	138.908	5%	155577	252813	350048	£155,576,960	£2,878,173,760	£0	
90% of non-EVs will switch to electric 2030-2040, as most vehicles are replaced within 10 years,	2.007	10%	22023	132139	220232	£88,092,609	£1,453,528,044	£548,634,150	1 £5k EVCP per 10 cars: £54,863,415
20% of cars and vans are electric by 2030	2.007	15%	90789	90789	90789	£36,315,467	£907,886,672	£452,340,000	1 £5k EVCP per 10 cars: £22,617,000
Those households with no cars/vans doubles from 20% to 40%, i.e these households sell their cars/vans	2.098	15%	58438	58438	58438	£23,375,179	£584,379,465	£0	
Those who keep their car share through lifts for school runs and regular commutes	0.317	15%	54979	54979	54979	£21,991,484	£549,787,110	£0	
20% are hybrid vehicles by 2030	0.728	15%	32943	32943	32943	£13,177,127	£329,428,163	£452,340,000	
50% of households who own more than one car (36%) give up their second car, using new e-car hire, pooling and community car and van clubs	0.773	15%	19383	19383	19383	£7,753,322	£193,833,059	£0	
20% have shifted to smaller vehicles by 2030	0.422	15%	19101	19101	19101	£7,640,213	£191,005,323	£0	
Switch to public transport	0.995	0%	12130	12130	12130	£4,851,845	£135,851,671	£0	
Remaining buses switch to green e-fuels	38.877	5%	6220	10108	13996	£6,220,320	£115,075,920	£0	
Switch to walking & cycling	0.788	0%	9612	9612	9612	£3,844,816	£107,654,862	£0	
and engage in more fuel efficient driving	0.284	0%	3460	3460	3460	£1,384,062	£38,753,724	£0	

Programme Options for Transport

- EV strategy – LEVI investment in EV charging infrastructure providing universal fair access to charging.
- Lead by example – electrify the council fleet
- Publicise supportive apps like Luv My EV showing the costs and benefits based on people’s actual movements
- Create mobility hubs and encourage modal shifts.
- Introduce zero emission zones in all town centres, enforced with congestion charges
- Ensure all new housing incorporate public charge-points, cycle paths to town, e-bike hire, and mobility hubs
- Investigate car share clubs and schemes particularly for rural communities
- Right size public transport and investigate ‘hail a mini-bus’ demand driven alternatives
- Publicise national grants for buying bikes, electric cars, and chargers
- E-fuel trial at council depot, investigate local e-fuel production (Chelveston) and work with local petrol stations and fleets to switch to e-fuels
- Refresh the transport, housing and planning policies to reflect net zero strategies



Transport Roadmap

	2023	2025	2030	2040	NNC Role
Cars			20% of cars and vans are electric & a further 20% are hybrid & a further 20% switch to smaller, more efficient cars	90% of non-EVs will switch to electric, as most vehicles are replaced within 10 years,	
Public EV charge-points needed in NN	89 standard & 13 rapid today. LEVI plan	615 standard & 45 rapids Close to 60% of houses without OSP	1647 std & 120 rapid new chargers needed	2617 std & 198 rapids – 95% within 10 minutes walk of EVCP	Lead, invest
Community-led	Car club trials Mobility hub trials E-bike hire trials	25 mobility hubs established across NN	Those who keep their cars share lifts, e.g. school runs and commuting	95% within 10 minutes walk of car club or mobility hub	Lead, lobby, Invest
People-change	How to drive efficiently and save fuel costs campaign	Develop & publicise behaviour change apps Publicise grants	Households with no car doubles from 20 to 40%	50% of households give up their second car, switching to car hire clubs on a demand basis	
Trucks	E-fuels proof of concept	Trial e-fuels at council depot	E-fuel made & sold locally	E-fuels all ICE-berg vehicles	
Public sector	Refresh transport, housing & planning policies for net zero	Electrify the council fleet Trial minibuses on demand	Urban ZE zones Hybrid bus fleet	All settlements linked by cycle and foot paths, & public transport on demand All town centres zero emission	Lead, lobby, invest

Industry, commerce & waste

Initiative	Saving tCO2e /capita pa	Annual Take-up Growth Assumption	2025 tCO2	2030 tCO2	2035 tCO2	2040 tCO2	2050 £ benefit	cumulative benefit	investment cost	public support
People should be encouraged to share, re-use and upcycle – and this commerce should be encouraged and incentivised.	0.517	50%	35993	35993	35993	35993	£14,397,142	£395,921,416	£0	
All those who can work from home should – around a third of people’s jobs can be done from home.	0.445	100%	18729	18729	18729	18729	£7,491,412	£209,759,522	£0	
Less packaging should be used	0.160	50%	16724	16724	16724	16724	£6,689,784	£183,969,052	£0	
Plastics should be designed out of new goods, and always recycled from waste.	0.076	50%	7914	7914	7914	7914	£3,165,420	£87,049,045	£0	
The council needs to improve its recycling facilities and capabilities, so 80% of all waste is recycled, and as much carbon and methane is captured or turned to energy as possible.	0.058	50%	6012	6012	6012	6012	£2,404,812	£66,132,317	£0	
Material efficiencies across industry	0.290	50%	4584	4584	4584	4584	£1,833,426	£50,419,218	£0	
Existing commercial and industrial buildings refurbished rather than re-built where possible, to reduce the construction industry carbon footprint.	0.929	50%	4411	4411	4411	4411	£1,764,422	£48,521,602	£0	
Energy Management systems driven commercial efficiencies	0.230	50%	3636	3636	3636	3636	£1,454,270	£39,992,438	£0	
Similarly, business travel should be discouraged – business travel should be cut in half	0.833	100%	3291	3291	3291	3291	£1,316,290	£36,856,120	£0	
The council needs to recycle organic waste, so as much as carbon is recycled as possible	0.027	50%	2823	2823	2823	2823	£1,129,266	£31,054,803	£0	
Local industry take end-of-life responsibility for their goods, along with an expectation for re-use and recycling into raw materials.	0.018	50%	1902	1902	1902	1902	£760,959	£20,926,383	£0	

Industry, commerce & waste

- **Measure: Understand: Improve** - “ESOS Lite” for SME’s
 - **Measure, manage and mitigate carbon emissions**
 - Buildings and Processes
 - Business benefits from reduced costs, greater efficiency and streamlined processes
 - Make NN businesses more competitive / attractive / compliant in the wider supply chain
 - Boosting staff morale, keeping stakeholders engaged and enhancing brand reputation
- **Scope 1, 2 and 3**
 - Support for businesses to address their whole supply chain (60-80% of CO₂e is Scope 3)
- **Lead the way**
 - Recycling and upcycling programme - focus on improving the supply chains for recycling and improve recycling rates with greater granularity
 - EV’s – from support for staff charging as part of a holistic NN wide solution to the transition of logistics fleets
- **Information & Education Programme**
 - Providing business with access to information on programmes, grants, suppliers and skills
 - To include building improvements
 - Unlocking local prosperity and economic growth by meeting business (and the new Net Zero economies) needs for skilled staff
 - Prepare programmes to leverage year 2 and 3 Prosperity Fund for up-skilling the local economy

Food, Farming & Forestry (LULUCF*)

Initiative	Saving tCO2e /capita pa	Annual Take-up Growth Assumption	2025 tCO2	2030 tCO2	2035 tCO2	2040 tCO2	2050 £ benefit	cumulative benefit	investment cost
If fossil fuel fertilisers were banned so everyone ate organic food	0.471	10%	49209	164028	164028	164028	£65,611,347	£1,561,550,051	£0
Planting all low grade land with trees	0.022	4%	17978	47940	77903	107865	£67,116,280	£973,186,060	£7,782,500
Planting every roadside verge with trees	0.022	4%	5073	13528	21983	30438	£18,938,951	£274,614,787	£2,196,075
And 20% of people only bought locally grown food (requiring a supply chain shift)	0.444	1%	4642	12378	20114	27851	£17,329,341	£251,275,439	£0
If a further 20% of people became vegetarians (up from 11% today)	0.519	1%	4300	11239	17906	24310	£14,548,942	£218,578,323	£0
If a further 20% of people cut down on red meat by 50%	0.482	1%	3992	10436	16626	22572	£13,508,638	£202,949,142	£0
If 10% of people become vegans (up from 1% today)	0.912	0%	3796	10022	16125	22106	£13,486,334	£199,078,095	£0
If a further 20% of people shifted to fish and plant based diet (no red meat)	0.424	1%	3518	9196	14650	19890	£11,903,490	£178,833,953	£0
Planting Rockingham forest	0.022	4%	2310	6160	10010	13860	£8,624,000	£125,048,000	£1,000,000
Leaving 20% of people who will not change at all... apart from reducing wasted food to cut bills	0.321	1%	2330	6106	9752	13272	£7,980,370	£119,370,858	£0
And further 20% of people only ate seasonal fresh food and froze less	0.205	1%	2143	5715	9287	12860	£8,001,524	£116,022,104	£0
If 10% of people grew their own vegetables	0.364	0%	1523	4060	6598	9135	£5,684,185	£82,420,686	£0
If a further 10% of people reduced their food intake, to just what they needed	0.303	0%	1262	3331	5359	7347	£4,482,060	£66,161,787	£0
Planting trees around every new development (@ 1 tree per home)	0.022	4%	81	216	350	485	£301,840	£4,376,680	£3,500,000

LULUCF Programme Options

Three programmes are suggested:

1. Focus on Food – consumer behaviour change programme to encourage switching away from meat and focus on local organic healthy food that is also cheaper to buy – win/win. Engage with celebrity chefs like Jamie Oliver for school lunches & for national support
2. Focus on farming – work with local farmers, landowners and retailers to re-focus the supply chain on growing food locally for local people first – and working with food and farming agencies to switch from growing crops for animal feed to growing crops for human consumption
3. Focus on forestry – a ‘lead the way’ programme with all landowners to plan trees on and around every verge, roadside, school, hospital, housing estate, allotment and unproductive land. Work with builders, planners, architects and the construction industry to set up future supply chains for locally grown wood to be used in construction locally, aligned with switch from carbon-heavy concrete, bricks and mortar to carbon offsetting and absorbing wood construction

Energy

Initiative	Saving tCO2e /capita pa	Annual Take-up Growth Assumption	2025 tCO2	2030 tCO2	2035 tCO2	2040 tCO2	2050 £ benefit	cumulative benefit	investment cost
green the grid - homes buy 100% renewable energy from grid	7.380	4%	102779	274077	445375	616673	£383,707,750	£5,563,762,369	£0
Improved cooking equipment - more efficient cooking	0.553	20%	94020	160341	182073	189194	£76,916,788	£1,850,176,789	£0
Personal domestic home efficiencies - only heat/boil the water you need	0.300	20%	50906	86815	98582	102437	£41,645,920	£1,001,761,997	£0
Solar PV car port canopies on every car park	0.031	3%	18014	48036	78059	108082	£67,250,978	£975,139,180	£293,490,000
Small scale 10m wind turbines on every car park above the solar canopies	0.031	3%	15011	40030	65049	90068	£56,042,482	£812,615,983	£163,050,000
Lower room temperature	0.140	20%	23753	40507	45998	47797	£19,431,704	£467,415,343	£0
Solar PV on every roof	0.746	3%	8591	22909	37228	51546	£32,072,939	£465,057,617	£537,415,200
V2x EV battery charging and clean energy storage for all homes	0.746	3%	8591	22909	37228	51546	£32,072,939	£465,057,617	£537,415,200
Shift to more efficient appliances	0.107	20%	18238	31102	35317	36699	£14,919,876	£358,886,650	£0
Less energy use for washing clothes	0.073	10%	6934	14573	19084	21748	£9,699,706	£199,293,062	£0
Better use of appliances (only switch on when needed)	0.035	20%	5990	10215	11599	12053	£4,900,125	£117,868,893	£0
Earth bank thermal solar seasonal summer heat storage and winter heating for new housing GSHP	0.680	limited	0	476	2856	5236	£3,998,631	£43,984,945	£294,000,000
Less paper	0.010	20%	1750	2984	3388	3521	£1,431,336	£34,429,738	£0

Programme Options for Energy

The energy sector requires the biggest changes, as we need to invest in clean renewable energy for every home and business in the area, drive towards energy self-sufficiency, reduce energy poverty, encourage all types of energy efficiency measures, and dramatically improve the insulation across our housing stock. Four programmes are suggested:

1. Public sector leads the way:
 - Capital programme across its estate to install insulation, solar panels, and replace boilers
 - Wind turbines on top of Solar carport canopies over EV chargers across its carparks & street lights
 - Planning permission for new renewable energy schemes – for every roof, greenhouse and car park
 - Requirement for all new buildings to have solar, EV/V2x battery storage, and EPC A insulation
 - Retro-fit requirement across industry and commerce – e.g. every warehouse, car park & windy place
2. Private sector does the majority of work – with high energy prices and the growth of green funds, there is large amount of investment available for cleantech and renewable energy initiatives, which can fund the majority of change, assuming agreed long-term off-takers for the energy and the removal of current WPD DNO blockers and national grid constraints. The grid needs to be an proactive partner.
3. Community-led initiatives cover the hardest to reach areas with public support as required, including fund to seed uncommercial local community initiatives and community energy schemes and micro-grids
4. Consumer behaviour change programme to educate everyone how to save money on energy bills: optimal use of appliances, control of heating, only heating water needed, more efficient cooking, etc

Energy Roadmap

	2023-5	2025-30	2030-40	2040-50	NNC Role
Public estate	Insulate all homes Upgrade heating systems when replacing boilers Renewables implementation plan	Install wind turbines on top of solar canopies above car parks – 25% complete Wind & solar on 25% of street lights Wind & solar on 75% of public buildings	50% of car parks	75% of car parks	Lead, lobby, invest
Private sector	Step change in policy to champion planning consent Funding programme agreed with investors	All new buildings have renewable generation, management & storage	50% of roofs have solar and/or wind with EV/storage batteries	80% of buildings retro-fitted to net zero 100% new homes net zero	Lead, lobby, invest, police
Community-led	CIC community fund set-up 5 pilot communities	Local energy communities set up for 20% of 108 local councils	50% of local councils have community schemes in place	80% of local council areas have open renewable energy self-sufficiency community schemes	Lead, lobby, Invest
People-change	Start behaviour change & educational programme	Include in schools & colleges Train teachers and advisors Energy audit processes & grants for improvements	Cleantech solutions to identify and nudge bad behaviours		

NN2NZ (Nascent) Route Map to 2050

Public/Private	Grey
NNC	Purple
Govt	Red
Private	Yellow
Community	Green
NN2NZ	Blue

Action / Intervention	2023	>2025	2025 - 2030	2030-2035	2035-2040	2040-2050	Lead	Champion	Enable	Direct Invest
Buildings										
Better efficiency										
Insulation	Council/Housing Stock Insulation programme developed Private Housing Stock Campaign with Finance Support Developed	10%	25%	50%	100%		NNC	NN2NZ	NNC	Public / Private
Control	Develop package of energy management controls for installation with supporting finance	10%	25%	50%	90%		Private	NN2NZ	Govt	Public / Private
Education for informed decisions										
Better Systems										
Switch from Fossil to Electric	Develop a support offer and campaign to inform residents of options and financial case for switching					90%	NN2NZ	NNC	Private	Public / Private
Local Renewable electricity and heat generation	Information Programme Established along with Community Fund for Net Zero			20%	40%	70%	NN2NZ	NNC	Private	Public / Private
Better New Buildings										
Programme for Planners, Architects, Developers, Builders	Programme developed in line with policy and with stakeholder bodies (RTPI, RIBA/HFI)						NN2NZ	NNC	Govt	
Net Zero Literacy Solutions Updates	CPD Programme	CPD Programme					NN2NZ	NNC	Govt	
Case Studies and Best Practice	CPD Programme	CPD Programme					NN2NZ	NNC	Govt	
Policy on Embodied and Operational Net Zero		NNC to lead on minimising excavation waste and maximise use of environmentally friendly materials and recycled materials including asphalt and gully wrings					NNC	NN2NZ	Govt	
Annual Review of Holistic New Build Programme for net zero										
Transport										
Enabling strategies										
	Refresh transport policy to embed net zero strategies Create LEVI backed infrastructure programme	Deliver LEVI Programme refresh housing and planning policy to incorporate Route Map to net zero	Review Deliver LEVI Programme and ongoing principles	Review	Review		NNC	NN2NZ		
Cars	Mobility hubs trial MNC lead with "grey fleet" review centred on emissions	25 mobility hubs MNC Actions on Grey Fleet review	trial ZE zone MNC No Grey Fleet Emissions	urban zero emission zones			NN2NZ	NNC	Private	Public / Private
Trucks, specials & classics	e-fuel trials start at council depot trial haul-a-bus service	e-fuel production plans e-bike hire in all mobility hubs	80% people without Off Street Parking can walk to EVCP 80% people within 10 mins of EVCP	95% 5 minutes to EVCP, car club or mobility hub	All remaining ICE vehicles run only on e-fuels		NNC	NNC	Private	Public / Private
Public transport	e-bike hire trials car club trials	e-bike hire in all mobility hubs all villages to have car clubs	Bus fleet transition (hybrid) cyclepaths link all urban areas all new developments must have car clubs	Remaining buses switch to green e-fuels	Switch to public transport		NNC	NN2NZ	Private	Public / Private
Sharing/pooling	campaign to educate how to drive efficiently and save fuel	campaign to educate how to drive efficiently and save fuel			Switch to walking & cycling		NNC	NN2NZ	Private	Public / Private
Modal shift	publicise transport cost-saving apps				Those households with no cars/vans doubles from 20% to 40%, i.e these households sell their cars/vans Those who keep their car share through lifts for school runs and regular commutes 50% of households who own more than one car (36%) give up their second car, using new e-car hire, pooling and community car and van clubs		NNC	NN2NZ	NNC	NNC
Energy										
Public estate	Insulate all homes Upgrade heating systems when replacing boilers Renewables Implementation plan	Install wind turbines on top of solar canopies above car parks – 25% complete Wind & solar on 25% of street lights Wind & solar on 75% of public buildings	50% of car parks	80% of car parks	90% of car parks		NNC	NN2NZ	NNC	Public / Private
Private sector	Mobility hubs trial	Funding programme agreed with investors	All new buildings have renewable generation, management & storage	50% of roofs have solar and/or wind with EV/storage batteries 80% of parish & local council areas have open renewable energy self-sufficiency community schemes	80% of buildings retro-fitted to net zero 100% new homes net zero	All new buildings have renewable generation, management & storage	NN2NZ	NNC	Private	Public / Private
Community-led	OC community fund set-up 5 pilot communities	Local energy communities set up for 20% of 108 parish councils include in schools & colleges	50% of parish & local councils have community schemes in place		90%		NN2NZ	NNC	Private	Public / Private
People-change	Draft and Start behaviour change & educational programme	Train teachers and advisors Energy audit processes & grants for improvements	Clear-cut solutions to identify and nudge outdated behaviours	90% electric vehicles	90% electric vehicles		NN2NZ	NNC	Private	Public / Private
LULUCF										
Food	Start behaviour change campaigns	Identified behaviour change wins expanded Start localising food supply chains Start transition from growing livestock feed to a-fuel crops	All public canteens changed Champion retailers	All retailers localised Food mile taxes		Behaviours changed to net zero 50 % gardens grow food 80% and use food sold locally organic, vegetable based and 10% LU for E-fuels, 10% LU livestock	Private	NNC		
Farming	Local trial opportunities mapped	Strategy for maximising tree planting / use of verges, unused public land and urban environments	Increase in transition to non-fossil fuel based fertilizers and organic fertilizers Tracked obligations for all new developments, annual audits of offsetting and remedial plans	New industry supply chain established for circular forestry and construction timber	50%		NN2NZ	NNC	Private	Public / Private
Forestry	Audit of existing plans and initiatives and baseline tree count						NN2NZ	NNC	Private	Public / Private
Industrial & Commercial										
Measure: Understand: Improve - a programme to support I&C to transition	Review option for an ESOS like approach to measure manage and mitigate carbon emissions with an focus on the business and economic case for transition	Implement an ESOS Lite Programme	Review and Adjust Programme				NN2NZ	NNC	Private	Private
Recycling & Resource Efficiency	Review I&C Recycling landscape working with Lini of Northampton as leading UK academics on waste - to formulate recycling and circular economy options	NNC introduce food waste collections and single-use plastics strategy. NNC will take a leadership role in minimising excavation waste and maximising carbon friendly building and construction materials Develop an information platform (website) for supporting local businesses to identify needs and opportunities and the financial model to transition	Eliminate single-use plastics				NNC	NN2NZ	Private	Public / Private
Transition to EV	Embedded 'workplace charging' in a LEVI bid for supporting NI transition Work with logistic sector and developers on infrastructure options to support local and last mile delivery Leadership from NNC to adopt Zero Emission Fleet strategy						NNC	NN2NZ	Private	Private
Information & Education Programme							NNC	NNC	NNC	NNC



Cross-cutting Themes

- Alignment
 - Across the public sector and with private initiatives
 - Policy and action
 - Communication
- Funding
 - Existing spending aligned
 - Growth and Prosperity funding and new emerging “Net Zero” specific leveraged
 - A new Community Fund for Net Zero to support local initiatives, capture value for the community and generate revenue to support Delivery and Stewardship
- Delivery and Stewardship
 - Ongoing Programme
 - Progress Review
 - Digital Twin

Challenges

- A fair transition
- Alignment on commitment and purpose
 - What is Net Zero
 - Outdated thinking that may be acting as a drag on the transition

Embodied Carbon



Embodied Carbon 40%

Operational Carbon 4%



And one more...



Transport 56%

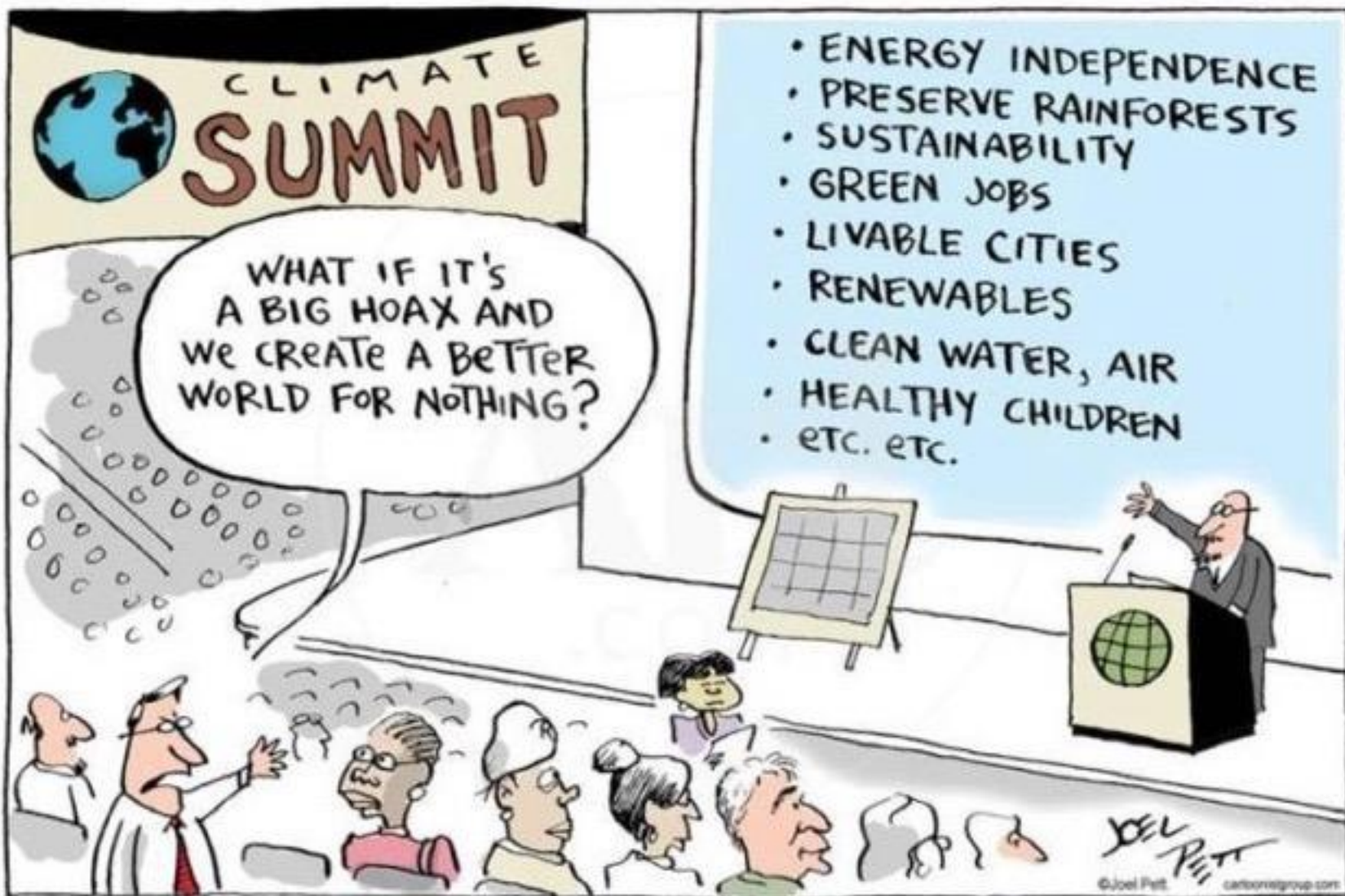


Challenges

- A fair transition
- Alignment on commitment and purpose
 - What is Net Zero
 - Outdated thinking that may be acting as a drag on the transition
- The scale and speed
- Maintaining focus and momentum

Distractions

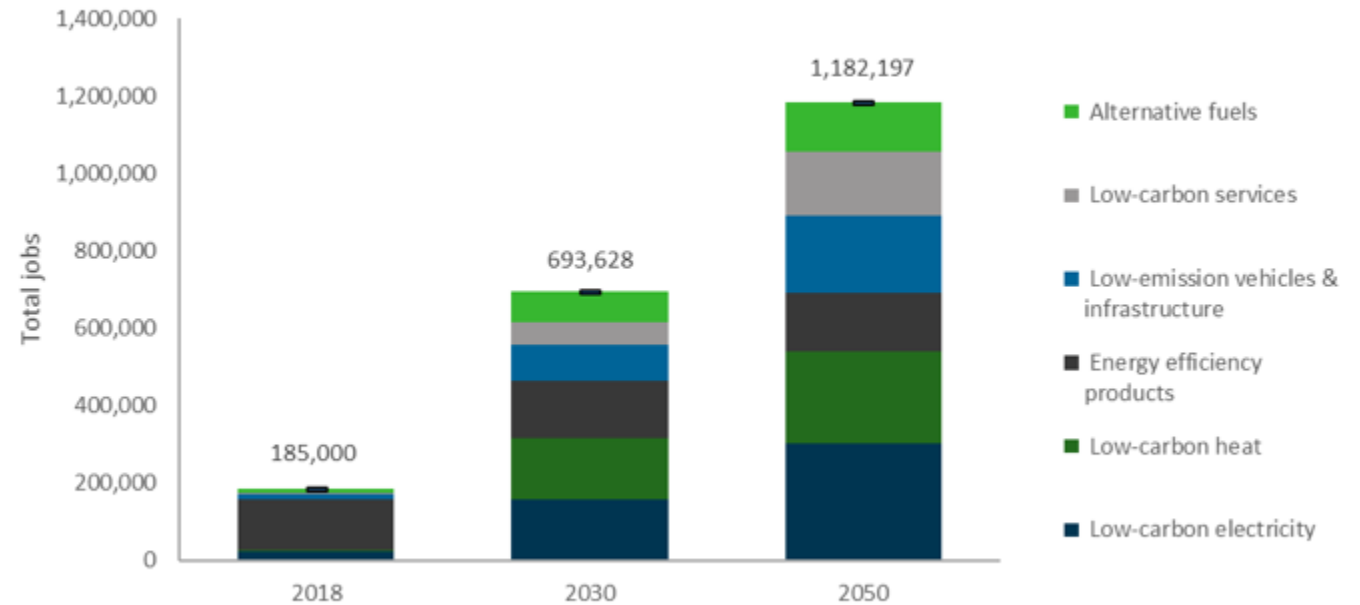
H₂



Economic, Health & Social Benefits

- New Jobs, New Businesses
- Lower energy bills
- Healthier environment
- More inclusive community cooperation
- More community spirit
- Energy resilience for communities
- Better transport options at lower costs
- Clean & green legacy for future generations

Low-carbon jobs in England - 2018, 2030 and 2050



Source: Local Green Jobs report for LGA in 2020

Ecuity Economics

Baseline Gap to Net Zero

Projects

Find, Filter, Feasibility

Sectors

Transport

Energy

Buildings

I & C

LULUCF*

Interventions

Technology

Infrastructure

Behaviour

Activity Lead

Private

Public

Community

Co-ordination

Funding

Delivery Support & Progress Review



* Land Use, Land-Use Change, Forestry



Delivery and Stewardship

- Year 1 Actions and Ongoing Programme
 - NN2NZ
- Progress Review and Adjustment
 - Digital Twin
- Funding
 - Public sector
 - Private Sector
 - Community Fund for Net Zero

Summary & Next Steps

- Net Zero Baseline
- Projects and initiatives gathered and assessed
- Strategic Pathway Options with a recommendation
- Route Map of actions nearing completion including indications on Council role

Next Steps

- Stakeholder engagement ongoing
- Options for funding and stewardship of Net Zero delivery
- Final Report

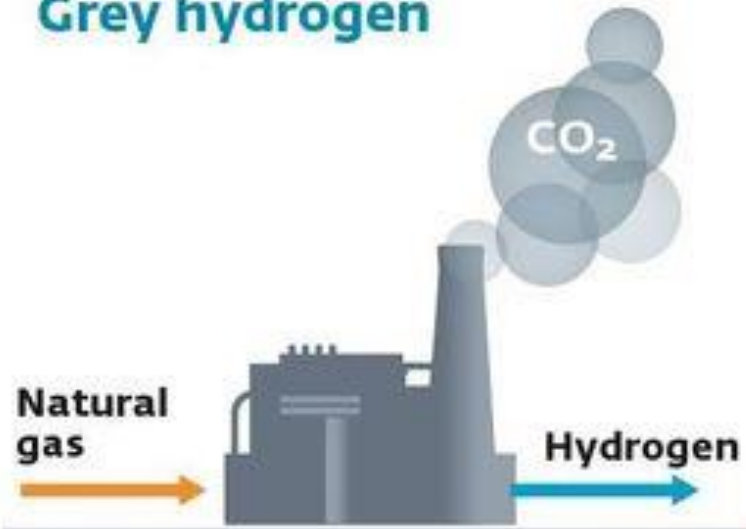


Thank You

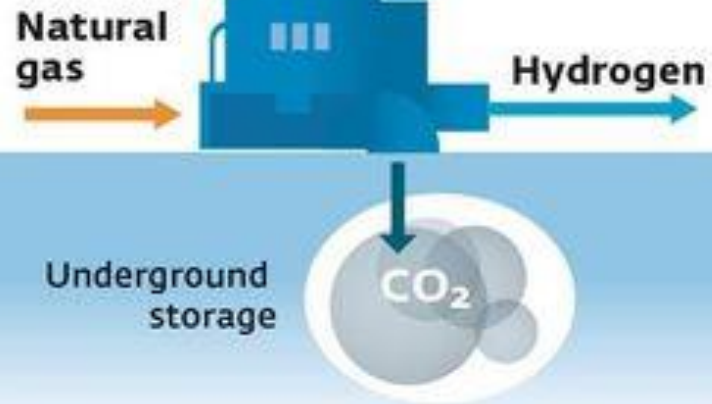
In advance of the NNC Executive Advisory Panel
Presentation from Electric Places (Electric Corby CIC) on the North Northamptonshire 2 Net
Zero project



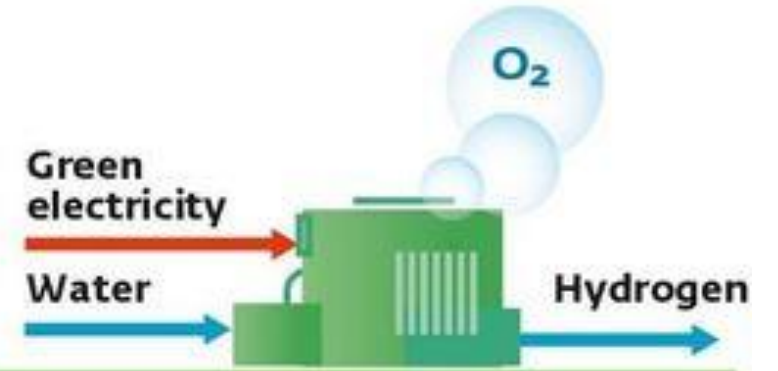
Grey hydrogen



Blue hydrogen



Green hydrogen

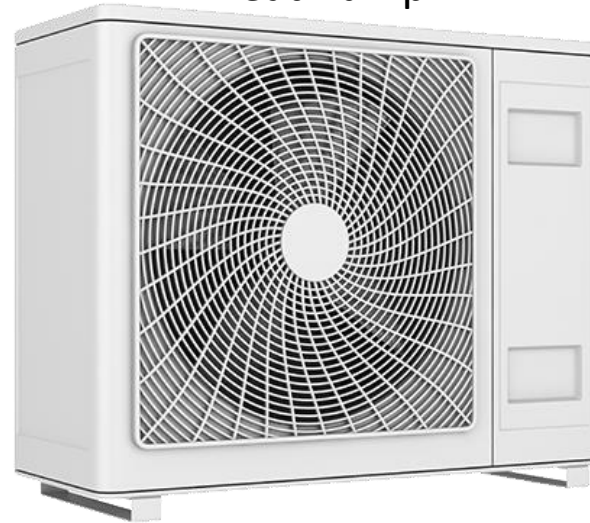


100kW
electricity

Convert to H₂

75kW
Hydrogen

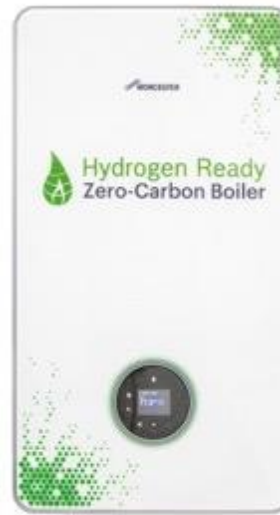
5% Loss in Transit



Heat Pump

285kW
Heat

25% Loss in Transit



Boiler

50kW Heat

Cars: Battery electric most efficient by far

