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National Food Strategy – call for evidence

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CREDS (the Centre for Research into Energy Demand Solutions), is a research centre established in 2018 with a vision to make the UK a leader in understanding the changes in energy demand needed for the transition to a secure and affordable, low-carbon energy system. Working with researchers, businesses and policy makers, our work addresses a broad range of issues. Our vision is for research in the UK to rise to the challenge of transforming the energy demand sector.

CREDS responds to consultations and calls for evidence from government, agencies and businesses, providing insight and expertise to decision-makers.

This response was created for the call for evidence on the National Food Strategy, and was written on behalf of CREDS by Alice Garvey, Dr Jonathan Norman, and Prof John Barrett (University of Leeds). The consultation ran from 17 August – 25 October 2019.

The focus of this response is on how the UK food system can be brought in line with net zero emission commitments, whilst also delivering key public goods. This aligns with the work of the CREDS Materials and Products theme on identifying remaining mitigation options for reducing energy demand in industry, and exploring the embodied energy and emissions implications of the use of materials and products throughout the supply chain. It also relates to work considering what level of demand reduction and resource efficiency is compatible with achieving net zero in 2050. The theme also works to develop governance approaches to realise this potential.

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Our response

1. We welcome the focus in the call for evidence on improving the environmental sustainability of the UK food system and recognising its critical role in climate change mitigation. We use this as the framing for our response. The UK's recent net zero commitment requires mitigation in every sector, not least the food system, given 11% of UK greenhouse gas (GHG) emissions are attributable to agriculture and land use,[1] and the food and drink (F&D) industry represents 7% of the UK's industrial GHG emissions.[2] This is further complicated when considering that the production emissions of the food system represent only 20% of the total consumption-based impact of UK food at a global scale.[3] Evidence presented here is part of ongoing analysis into future scenarios of the UK food system compatible with achieving net zero emissions by 2050. Details of the scenario assumptions and provisional results are found in the supporting evidence. We provide policy recommendations on the basis of these results and our wider research.

2. We found that a reduction to GHG emissions per capita per annum (in the F&D and agriculture sectors) of between 45-68% could be achieved between 2020 and 2050 according to the ambition level, or a 25-45% reduction in cumulative terms over this period. The mitigation options modelled as part of these scenarios addressed both the food supply and demand system, including: transitioning to more sustainable diets, moderating calorific intakes to healthy levels, food waste reduction, and agricultural and industrial efficiencies.

3. Livestock is estimated to account for approximately 70% of emissions within the UK agricultural sector.[4] The dietary shifts scenario therefore considered the emissions reduction associated with reduced meat consumption. The scenario was constructed on a basis of protein equivalence between diets. In our most ambitious scenario (assuming an increase of 67.5% in the proportion of vegetarians/vegans) GHG emissions per capita reduced by 18%, and cumulative emissions reduced by 9% between 2020 and 2050. These estimates are likely to be conservative however, as our analysis of the land-use change (LUC) implications of this shift is ongoing. The BAU case assumed a 33.5% increase in those becoming vegetarian/vegan by 2050, extrapolating recent trends in the uptake of plant-based diets. But a BAU transition to healthier, reduced meat diets is far from assured without policy intervention which capitalises on currently receptive attitudes towards both sustainability and sustainable diets.

    - There is considerable scope for compiling dietary guidelines which promote both better quality diets and improved environmental outcomes, as is being trialled in Brazil, the Netherlands and Sweden.[5]

- Public procurement guidelines could act as another policy lever to normalise reduced meat intake.[6]
- Another consumer-focussed solution would involve information provision by means of food labelling to encourage pro-environmental choices, such as proposals for 'climate labels' which are under discussion in Denmark.[7]

4. In 2017, 65% of the UK population was classified as being overweight or obese.[8] The calorific intake scenario considered what emissions reduction could be achieved if each UK resident had a 'healthy' BMI by consuming an average 2,500 calories per day. It was found that in the radical scenario (where the entire population has a 'healthy' BMI) emissions per capita could be reduced by as much as 20%, and cumulative emissions by 10% between 2020 and 2050. Variable pricing strategies are considered to have negative distributional impacts on low income groups due to the relative costliness of 'healthier' goods.[9] Recognising the role of food environments should be an important part of this policy. A recent UN report found that in the UK '1 in 3 children are now overweight or obese when they leave school',[10] attributing this to the rise of 'food swamps' which are disproportionately found in less affluent regions.

    - Policy could emphasise a 'value for calories' approach, that is, identify which foods have the highest nutritional quality per calorie, whilst ensuring that any variable pricing strategies are well-designed and distributionally just.

5. Household food waste in the UK accounts for 19 million tonnes of GHG emissions per annum according to WRAP, of which 60% is avoidable.[11] In our food waste reduction scenario we considered the emissions mitigation possible with decreased waste across each stage of the food system. Our radical scenario (where all avoidable food waste is eliminated by 2050) resulted in a GHG emissions reduction of 32%, with a 16% reduction in cumulative emissions between 2020 and 2050.

    - Reducing the waste of targeted food groups such as meat and dairy could have a disproportionate impact given the greater emissions intensities of these groups. This should be a priority area within waste reduction efforts.[12]

6. There has reportedly been limited progress in addressing agricultural emissions since 2008,[13] and the F&D industry is still the fourth largest industrial energy user in the UK.[14] In the most ambitious agriculture and industry scenario, all technical efficiency options are employed by 2035, achieving a 41% reduction in GHG emissions per capita, and a 31% cumulative reduction between 2020 and 2050. Key limitations in this scenario include a lack of available data, and uncertainties in how long the efficiency improvements can be sustained, therefore these results may be overestimates. Around three quarters of agricultural emissions are attributable to energy use and the management of waste[15] whilst the F&D industry remains highly dependent on fossil fuel use.[16] This points to remaining 'easy wins' for decarbonisation through fuel switching.

    - Policies such as tax incentives (e.g. similar to the expired Enhanced Capital Allowances scheme) and other supportive grants to de-risk investment in technologies (both renewables and efficiency) with large upfront capital costs could be effective.

7. The provisional findings of our analysis suggest that there is considerable scope for the food system to contribute to achieving national net zero emissions whilst working towards other key public policy goals. Current attitudes have created policy space for greater intervention by shaping a culture of acceptability around pro-environmental diet change. Relatively simple policy measures are available to implement the identified emissions savings and work towards a more environmentally, socially and economically sustainable food system.

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Supporting evidence

1. Underlying assumptions of the mitigation scenarios

Table 1.a. Share of each diet type in total population at each ambition level in 2050.

	Percentage (%) share of diets within UK population in 2050				
Diet type	**Current**	**BAU**	**Low regrets**	**Credible**	**Radical**
Omnivore	66.5	29.0	22.0	15.0	3.0
Healthy	17.0	21.0	23.0	25.0	15.0
Pescatarian	4.0	4.0	4.5	5.0	2.0
Vegetarian	9.5	31.0	33.0	35.0	40.0
Plant-based	3.0	15.0	17.5	20.0	40.0

Table 1.b. Share of the population within various BMI categories under different ambition levels.

	Calories per capita per day	**Percentage (%) share of UK population in each BMI group in 2050**				
BMI category		**Current**	**BAU**	**Low regrets**	**Credible**	**Radical**
Underweight	2000	2	2	0	0	0
Healthy weight	2500	34	23	67	82	100
Overweight	3000	36	34	18	18	0
Obese	3500	29	41	15	0	0

Table 1.c. Qualitative overview of food waste reduction assumptions per ambition level.

Ambition level	Description
BAU	Recent trends in food waste reduction are extrapolated (logistically) to 2050.
Low regrets	The Courtauld Commitment 2025 of 20% reduction (2015-25) is achieved, and a target at the same rate of reduction between 2025 and 2050 is set.
Credible	SDG 12.3 is met in this scenario, halving food waste by 2030 (against 2015 levels), and a comparably ambitious target is set for 2030-2050.
Radical	In this case, all avoidable food waste is eliminated in the UK.

Table 1.d. Percentage GHG emissions reduction achieved by each mitigation route in 2035 and 2050.

Ambition	System	% reduction potential achieved in 2035	% reduction potential achieved in 2050
BAU	Industrial	25%	50%
	Agricultural	18%	35%
Low regrets	Industrial	38%	75%
	Agricultural	25%	50%
Credible	Industrial	50%	100%
	Agricultural	50%	100%
Radical	Industrial	100%	100%
	Agricultural	100%	100%

2. Provisional results

Table 2. Summary of provisional results from the analysis.

	Reduction in per capita GHG emissions per annum from 2020-2050 (%)				**Cumulative GHG emission reduction (against current levels) from 2020-2050 (%)**			
Scenario/ambition level	*BAU*	*Low regrets*	*Credible*	*Radical*	*BAU*	*Low regrets*	*Credible*	*Radical*
Dietary shift (exc. land use change emissions)	8	10	11	18	4	5	6	9
Calorific intake	-4	10	16	20	-2	5	8	10
Food waste reduction	22	19	27	32	11	11	17	16
Agricultural/industrial efficiency	16	24	41	41	8	12	20	31
Aggregate ambition pathways	**32**	**45**	**64**	**68**	**17**	**25**	**37**	**45**