






These changes will need policy frameworks to guide them. Here are our suggestions for key steps to support and encourage these changes.

9.7 SUMMARY OF RECOMMENDATIONS

Customers/Energy Citizens 	Electricity 	Transport 
Inform the debate using accessible information on emission causes and their scale. Also on emissions solutions and their impact	Promote Ireland's status as a pioneer in integrating wind	Communicate the direction of travel following the Government review of VRT and motor tax
Build on the Climate Action Dialogue to engage communities	Engage with the European Commission to influence the development of a 'Target Model 2.0'	Provide confidence in the EV charging network
Obtain a cross-party position on the National Mitigation Plan	Secure potential storage sites for CCS and establish the legal and regulatory frameworks at an early date.	Non-financial incentives for early EV owners
Awareness-raising campaigns	Clarify the regulatory framework for biomass	EVs in Government fleets and bus fleets
		An early shared transport pilot in Dublin and other cities

Heat 	Networks 
Move to zero emissions in all new buildings	Policy guidance on facilitating the National Mitigation Plan
Trusted advisors for low carbon retrofit Set standards and support upskilling.	Facilitating low carbon heat and transport is a consideration in planning the networks
Low interest finance for home retrofit	Provide confidence in the capability of networks to support these goals
Enabling framework for heat network development	Adopt policies that facilitate customers making the transition
National heat study leading to a Heat Strategy	Review the networks tariff structure to ensure it supports the cost-effective transition to low carbon

*Since initial publication, some changes have been to the main report to correct typographical errors. A clarification has also been made to the route to decarbonisation for gas based heating on pages 7 and 64.

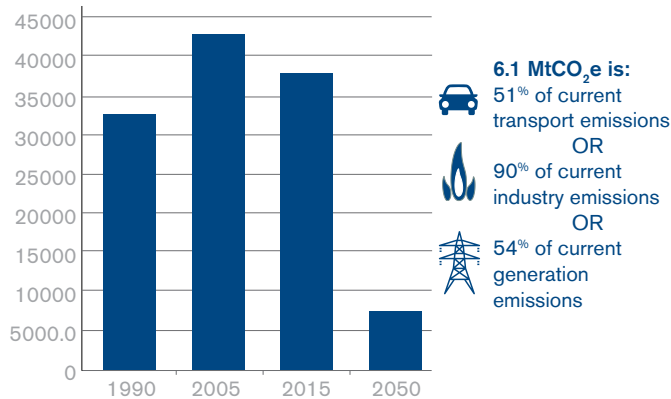
Ireland's low carbon future - Dimensions of a solution



Ireland's low carbon future

The overwhelming scientific consensus is that our climate is warming in response to man-made emissions of greenhouse gases. In order to limit temperature rise to the maximum acceptable level of 2C, net emissions must be reduced and then stopped completely. Ireland has committed itself, along with its EU partners to an 80% reduction in its emissions by 2050. This means a reduction from the present 60 Mt CO₂e each year to just above 6 Mt per year. A total emission level of 6 Mt is around half of today's transport emissions alone or about the level emitted by our homes in 2015.

THE TOTAL ENERGY SECTOR EMISSIONS TARGET IN PERSPECTIVE (ktCO₂e)



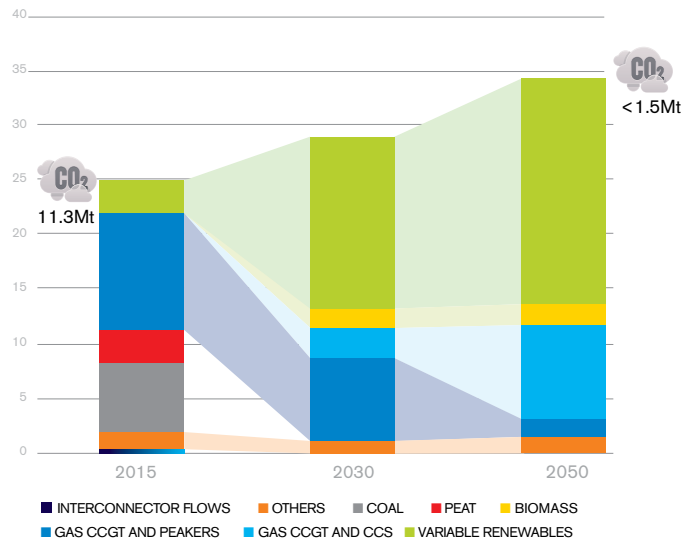
A reduction of this scale means a transformational change in Ireland's energy system. To do this in the optimal way, it will be important to pick measures and technologies that are capable of making the full transition. This is urgent as the Paris Agreement calls for accelerated action beyond our current target.

Pöyry and ESB have studied the current emissions, the candidate technologies and previous low carbon roadmaps from Ireland and other European countries. From this it has been possible to put forward the main elements of an optimal low regrets transition for Ireland.

ELECTRICITY

Just under a fifth of GHG emissions come from generating electricity. Current technology requires a mix of intermittent renewable generation and low carbon dispatchable plant. We envisage a continuing increase in renewables with the development of gas generation with carbon capture and storage to maintain security of supply.

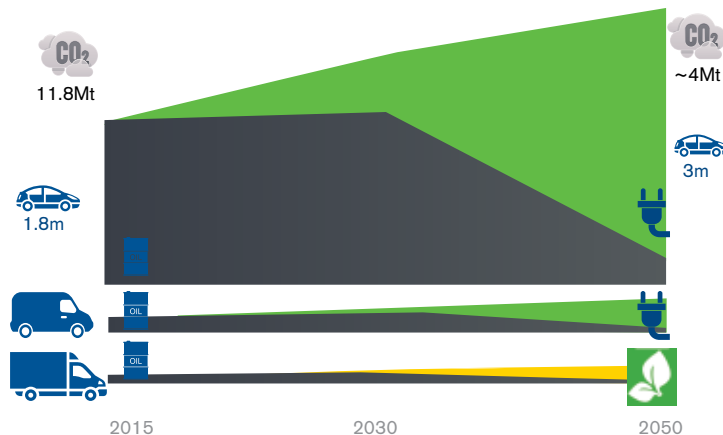
ELECTRICITY TRANSITION - GENERATION (TWh)



TRANSPORT

Transport emits a fifth of Ireland's greenhouse gas emissions. There is a growing consensus that light vehicles will transition to electric drive trains from the mid 2020s. The light vehicle fleet is expected to be almost 100% EV in 2050. In addition, we anticipate that heavy goods vehicles will transition to compressed natural gas and liquid biofuels with the possible addition of electric solutions from 2050.

TRANSPORT ROADMAP BY FUEL

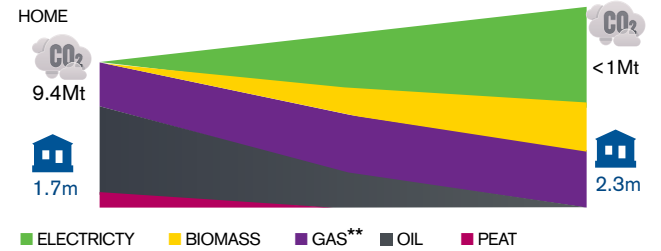


HEAT

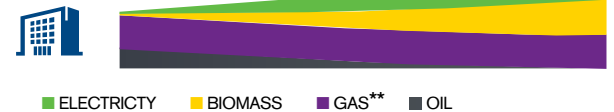
Heat represents 21% of Ireland's emissions. Space and water heating is very suited for renewable energy options.

Heat pumps and biomass are likely solutions – as well as district heating in cities and some rural towns. Moving to low carbon means a complete switch from oil heating. Industry will need to use biofuels or fossil fuels with carbon capture.

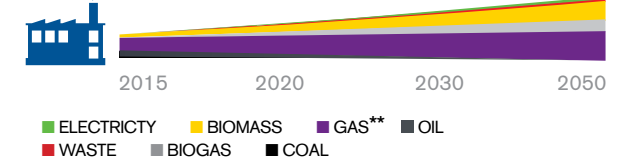
NON ETS HEAT ROADMAP BY FUEL



COMMERCIAL



INDUSTRY



** Gas is assumed to largely decarbonise though no specific solution is outlined here

CONCLUSION

Feasible, low regret technologies exist to make significant inroads into the transition to a low carbon energy future. These options coincide with energy choices that also lead to better health and social outcomes for society. For example better indoor and outdoor air quality.

Early action is cheaper in the long run. The challenge will be to scale the investment to meet the need, especially in heating, and courage to adopt creative approaches to drive the transition.

For the full report visit www.esb.ie/who-we-are/publications