Timeline of transport decarbonisation technology pathways

	To 2030	2030 – 2040	2040 – 2050
Light vehicles	**Battery electric passenger vehicles** mass market adoption	**Expansion of next-generation passenger** and advancements for light commercial vehicles	**Battery electric** available for all light vehicle tasks
	Hydrogen fuel cell demonstration	**Hydrogen fuel cell** adoption	**Hydrogen fuel cell** where electrification is not feasible
Heavy vehicles	**Battery electric** and **hydrogen fuel cell** demonstration	**Battery electric** and **hydrogen fuel cell** adoption accelerates	**Battery electric** and **hydrogen fuel cell** mass market adoption and efficiency improvements
	LCLFs blended in existing fleet use	**LCLFs** support long distance, hard to electrify cases to transition	**LCLFs** where **battery electric and hydrogen fuel cell** are still advancing / not feasible
	Synthetic LCLF R&D		
Rail	**Passenger rail electrification**		
	Hybrid and battery electric freight rail deployed	**Hybrid, battery electric and hydrogen fuel cell** mass market adoption and efficiency improvements	
	Hydrogen fuel cell demonstration		
	LCLFs blended in existing fleet use	**LCLFs** support long distance, hard to electrify cases to transition	**LCLFs** where **battery electric and hydrogen fuel cell** are still advancing / not feasible
	Synthetic LCLF R&D		
Maritime	**Battery electric and hybrid propulsion** demonstrated and deployed for short range vessels	**Short range battery electric vessels** deployed	**Short range battery electric vessels** adoption and efficiency improvements
	LCLFs blended in existing fleet use	**LCLFs** deployed for long range vessels	**LCLFs** for majority of long range vessels
	Synthetic LCLF R&D	**Continued** synthetic LCLF investment	
Aviation	**Battery electric** and **hydrogen fuel cell** development	**Battery electric** and **hydrogen fuel cell** for short range flights demonstration	**Battery electric** and **hydrogen fuel cell** for short range flights deployed
	LCLFs blended in existing fleet use	**LCLFs** for short, medium and long haul flights deployed in the market	**LCLFs** for majority of medium and long haul flights
	Synthetic LCLF R&D	**Continued** synthetic LCLF investment	
Transport Infrastructure	Domestic **low and zero carbon concrete, alumina** and **steel** industries emerging – used in transport infrastructure	Domestic **low and zero carbon concrete** and **steel** industries developing	**Low** and **zero carbon concrete** and **steel** is available for **infrastructure projects**
Enabling systems	**LCLF** optionality in existing fleets	**LCLF** used by transport modes that have limited electrification opportunities (aviation, heavy vehicles and maritime)	
	LCLF certification stimulates further demand		
	Optimisation of **intermodal infrastructure** developing	**Increased low and zero carbon options** to transport goods	
	Continued investment in **active and public transport infrastructure**	**Sustained investment and increasing use** of public transport	

Requires development to be feasible | Demonstrate scale and commercial viability | Deploy commercially ready technology | Used in limited, tailored applications

LCLFs are also in the Electricity and Energy Sector Plan