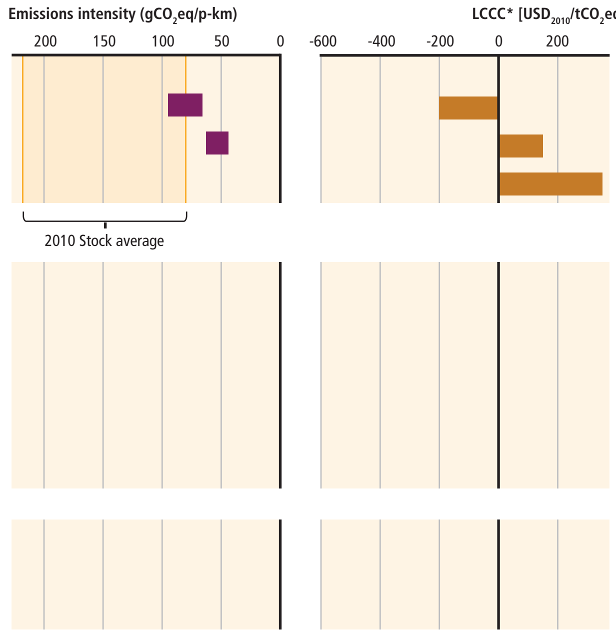
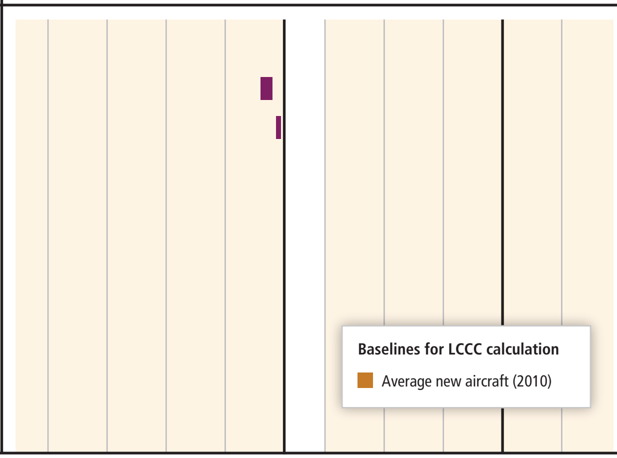
Mitigation options in passenger transport	Indicative 2010 stock average baseline CO_2eq emissions and reduction potential / Indicative direct mitigation cost in relation to the baseline (can be positive or negative)	Reference conditions and assumptions made	Illustrative examples
Aviation (Commercial, medium to long haul) 2010 Narrow and wide body 2030 Narrow body 2030 Narrow body, open rotor engine **Operational measures**	 	**Baseline: 2010 stock average commercial (25)** Medium haul aircraft; 150-passenger occupancy; average trip distance. **Aircraft efficiency:** Incremental changes to engines and materials up to 20% efficiency improvement. Most efficient present aircraft designs provide 15–30% CO_2 emissions reductions per revenue p-km compared to previous generation aircraft, at net negative costs since fuel savings typically greater than cost of improved technology. (5) **2030 next generation aircraft design:** Advanced engines up to 33% improvement; radical new designs such as 'flying wing', up to 50% improvement. Medium and long-haul (narrow and wide-body) aircraft compared to today's best aircraft design: - 20–35% CO_2 emissions reduction potential by 2025 for conventional aircraft - up to 50% with advanced designs (e.g., flying wing)(2) **Costs:** ~20% CO_2 reduction at <0–100 USD/tCO_2 (narrow body); ~33% reduction at <0–400 USD/tCO_2 (open rotor engine) (34). **Taxiing and flight operations** including direct routing, optimum altitude and speed; circling, landing patterns. Improved ground equipment and auxiliary power units can yield 6–12% fuel efficiency gains (3).	New current long-haul wide body: Boeing 787 is 30% more fuel efficient than Boeing 767; Boeing 747-800 is 20% more efficient than Boeing 747-400 (1, 51). New 2010 medium-long-haul, narrow body: Airbus A320 and Boeing 737 (42).
Rail (light rail car) 2010 Electric, 600 g CO_2eq/kWh_{el} 2010 Electric, 200 g CO_2eq/kWh_{el}	 	**Baseline: 2010 electric medium haul train** - Based on electricity grid 600 gCO_2/kWh: 3–20 gCO_2/p-km (25). **2010 light rail**; 60 passenger occupancy car: - CO_2 reduction at 4–22 gCO_2/p-km; - Infrastructure cost 14–40 million USD/km (5). **2010 metro:** - CO_2 reduction 3–21 gCO_2/p-km; - Infrastructure cost 27–330 million USD/km (5). **2010 long-distance rail:** - 45–50% reduction in CO_2/p-km (augmented if switch to low-carbon electricity). - 14% reduction in operating costs (allowing for increase in speed and with energy costs excluded from cost calculation (38). - 8–40% efficiency gains (12–19 gCO_2/p-km). - Infrastructure cost 4–75 million USD/km (5). Potential GHG savings from eco-driving 15%; regenerative braking 13%; mass reduction 6% (38).	European rail operations: Passenger: 46% reduction in GHG/p-km by 2050 with 11% reduction in operating costs (43). 8% improvement via regenerative braking systems (Amtrak, US); 40% through design and engine improvements (Shinkansen, Japan) (18). 35% reduction in energy intensity - for US rail operations (17).

*Levelized cost of conserved carbon (LCCC), here at 5% weighted average cost of capital (WACC)