Assumptions being made for 2035 Projection

Base year for projection: 2019

Sources of emissions	Scenario settings
Public Electricity Generation	**Emission caps** Adopted the allocation of emission allowances under the Ninth Technical Memorandum (latest as at the moment and will be further updated in case new TM being issued) **Fuel mix by 2035** Coal: 0%; Natural gas: >40%; Renewable energy & Zero-carbon energy: ~60%
Road Transport	See Annex A
Navigation	**OGVs (contributing 51% $PM_{2.5}$ and 46% of NOx of Navigation sector in 2035 projections)** 1) no VAN growth in OGVs but consider the percentage of Tier 0 engine (i.e. Chemical Carrier, Conventional Cargo, Ocean Cruise, Dry Bulk Carrier, Fully Cellular Container Vessel, Gas Carrier/Tanker, Oil Tanker, Roll On/Roll Off, Semi-container Vessel, Tug, Others) will drop by 1% annually with an increase of 1% of Tier 2 engine for all OGVs other than Fishing Vessel, Lighter Barge Cargo and Pleasure. While for Fishing Vessel, Lighter Barge Cargo and Pleasure under OGVs categories (i.e. they are other OGVs except the ones stated above) are all Tier 0 till 2040 2) 2,000 VAN of OGVs (all 1,000 Liquefied Natural Gas (LNG) -fuelled OGVs will call or transit Hong Kong for 2 times) will use LNG, i.e. about 4% of total VAN, remaining ones will use 0.1% S fuel **RVs (contributing 8% $PM_{2.5}$ and 19% of NOx of Navigation sector in 2035 projections)** 1) Activity level: assuming 0.2% VAN growth in RVs based on MD's port statistics, no VAN of Macau ferries 2) Measures: 5% PRD ferries and 5% RTVs will use LNG, remaining ones will use 10ppm Marine Light Diesel (MLD) **LVs (contributing 40% $PM_{2.5}$, 35% NOx and 76% VOC of Navigation sector in 2035 projections)** 1) Activity level: Class 1a, 3 and Government Vessels assumed no growth while other classes of LVs applying projected rate of change making reference to MD's port statistics

Sources of emissions	Scenario settings
	2) Measures: ➢ 14 in-harbor ferries turn electric ➢ 47 outlying island ferries turned hybrid by 2030. Out of the 47 new vessels, all will be equipped with Tier III engines (i.e. 80% NOx cut compared with traditional ones); 29 will be hybrid assuming 15% cut in overall emissions; 2 will be constructing with lightweight materials assuming a total 30% cut in overall emissions. ➢ All incoming OBEs in compliance with the USEPA emission standards ➢ Fuel for all LVs will be 10 ppm MLD ➢ All new vessels, conventional or hybrid, will have engines meeting IMO Tier III standard, resulting a cut of 80% NOx ➢ On top of the 22 new vessels procured by 2025, another 25 new hybrid vessels to be procured by 2030 are all using light-weight materials which could have 30% fuel saving
Civil Aviation	1) based on Three Runway System Environmental Impact Assessment report and Hong Kong International Airport Masterplan 2030, the projected total air traffic movement (ATM) figures would reach the practical maximum annual capacity of the three-runway system in 2035 i.e. 620,000 ATMs per year; 2) fleet mix distribution in 2035 are assumed the same as in 2030 (estimated based on IATA's forecast trend); and 3) emission factors in 2035 are assumed the same as in 2019 for the aircrafts.
Other combustion	**Other combustion included emissions from Industrial Sector, Commercial Sector, Residential Sector, Non-road Mobile Machinery (NRMM), Asphalt mixing, Cement Production, Towngas Production, Sludge Treatment, Landfill Gas Flare, Incineration, Cigarette smoking** **Major contributors:** **NOx** 1. NRMM (48% emission of total "Other combustion" in 2019; among which, construction is the biggest source accounting for 88% of NRMM) 2. Cement production (18% emission of total "Other combustion" in 2019)

Sources of emissions	Scenario settings
	$PM_{2.5}$ NRMM contributed 48% $PM_{2.5}$ emission of total "Other combustion" in 2019. Construction is the biggest sector among NRMM, accounting for 59% of NRMM part. **Assumptions for NRMM - construction** - Activity level: emission increased by 8% when compared with 2019, taking construction employment rate as surrogate. - Due to tightening of emission standards of newly supplied regulated machines, the cumulative regulated machines with (Stage IV) available in 2035 increased when compared with 2019. **Assumptions for cement production** - Activity level: emission increased by 8% when compared with 2019, taking construction employment growth as surrogate.
Non-combustion	**Non-combustion contributed 18% $PM_{2.5}$ and 56% VOC of total emissions in 2019, excluding hillfire emission** **PM2.5** 1) Emission from brake, tyre and surface was the largest source, contributing 65% of non-combustion $PM_{2.5}$ source; 2) Emission from brake, tyre and surface assumed increasing with VKT. **VOC** 1) Considered VOC emissions from VOC containing products, including architectural paint, vehicle refinishing paint, marine paint, printing ink, consumer products, adhesive and sealants, fuel and pesticides. 2) Major contributors: consumer products and total paint accounting for 45% and 23% of NCVOC respectively in 2019. 3) Activity level: a) Consumer product – increased by 7.9% when compared with 2019, according to population growth and no. of vehicles b) Total paint – increased by 8.3% when compared with 2019, according to the increase in number of manual workers engaged at construction sites

Sources of emissions	Scenario settings
	4) New Control Measures on Non-combustion VOC from 2024: a) Impose VOC limits on 7 types of cleaning products Estimation of 292 tonnes VOC reduction by imposing legal limit on the affected cleaning products b) Further tighten VOC limits on 22 types of regulated architectural paints under the VOC Regulation Estimation of 580 tonnes VOC reduction through tightening the legal limit of the affected architectural paints