

Recommendations for the Development of Future Emission Standards

针对未来排放标准发展的若干建议

Dr. Felipe Rodríguez
Program Lead / 重型车项目负责人

**4th Sino-EU Workshop on New Emissions Standards and
Regulations for Motor Vehicles (03.03.2021)**

Relevant ICCT publications

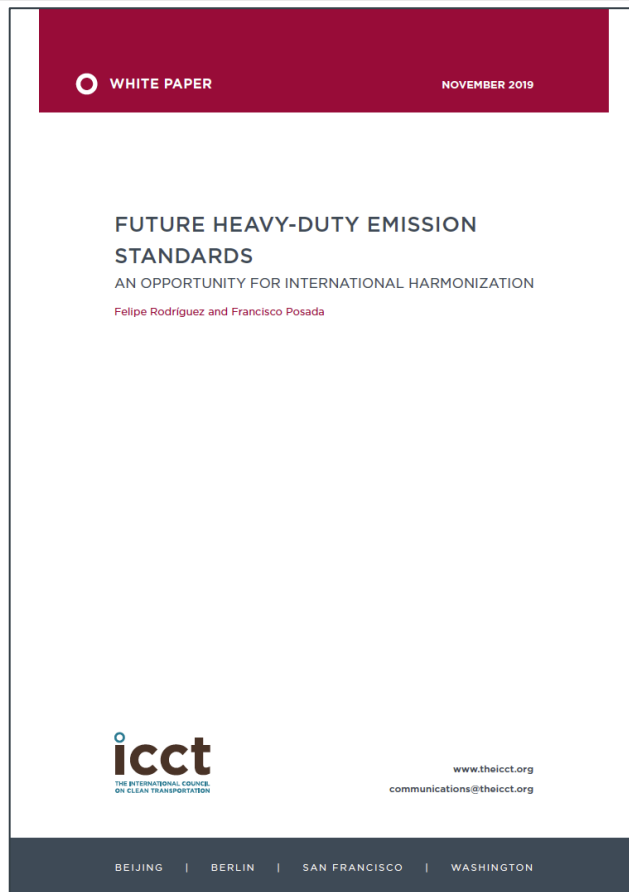
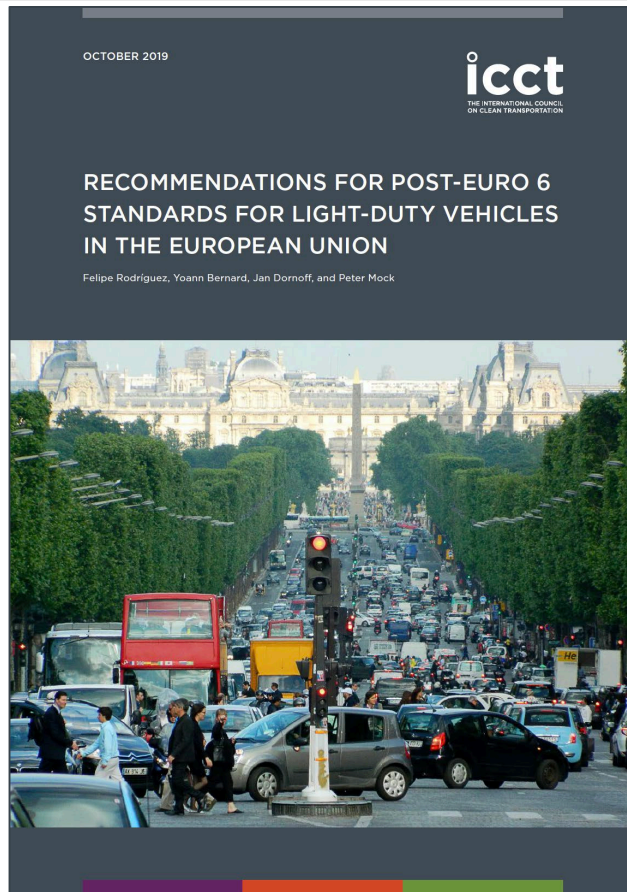
ICCT 相关报告及研究

LDV: 轻型车

<https://theicct.org/publications/recommendations-post-euro-6-eu>

HDV: 重型车

<https://theicct.org/publications/future-hdv-standards-harmonization>



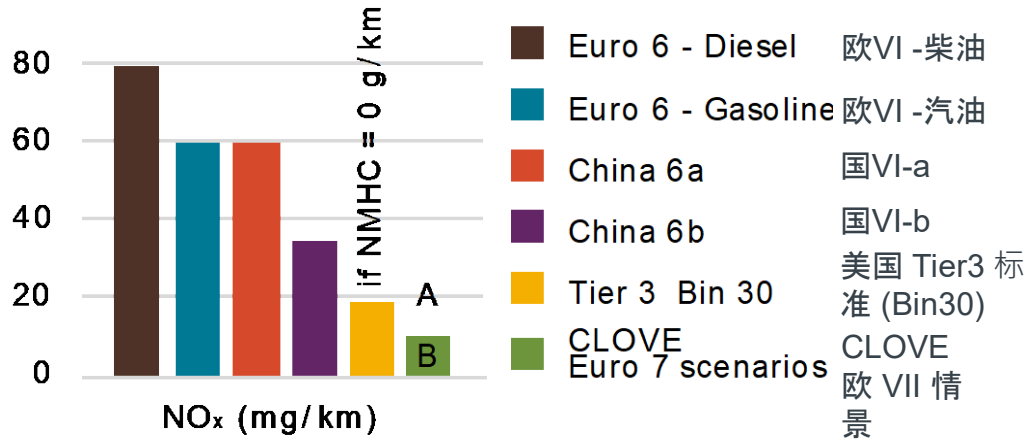
Environmental and health impacts

环境及健康影响

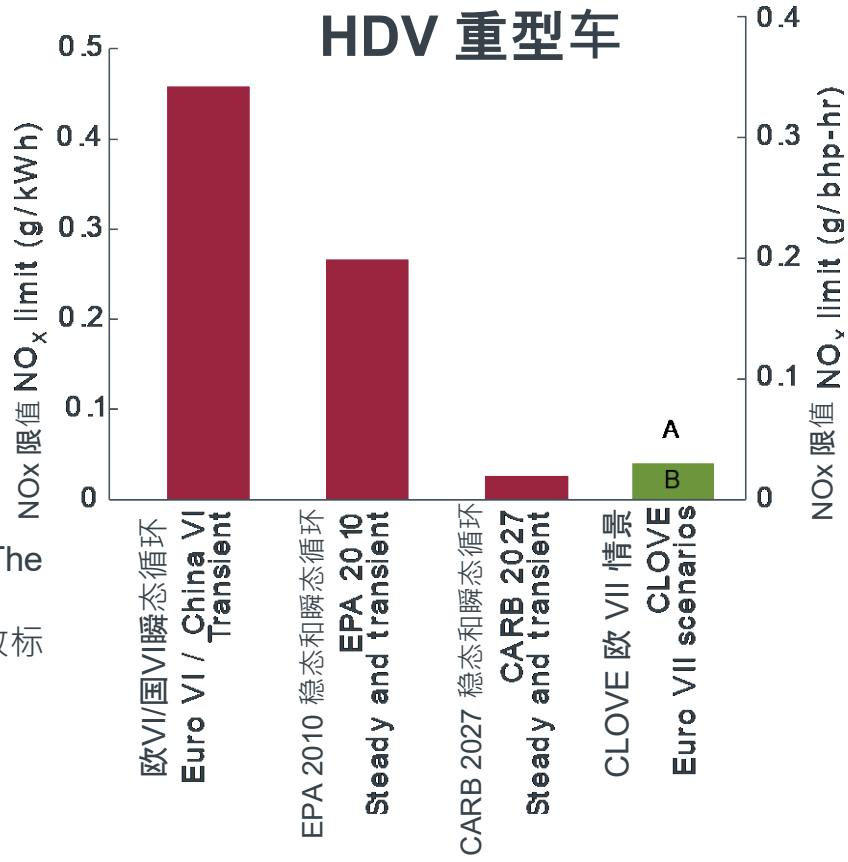
NO_x emissions continue to be the most challenging topic

NO_x排放继续成为最有挑战性的问题

LDV 轻型车



HDV 重型车



*These charts are meant as a summary, and not as a comparison. The stringency of emission standards goes beyond the laboratory limit.

*以上图表旨在汇总相关信息，不代表各标准之间存在比较关系。排放标准的严苛程度普遍超过实验室限值。

Health impacts of heavy-duty vehicles

重型车的健康影响

Adopted: Considers the projected effects of policies adopted (i.e. Euro/China VI)

Adopted + Accelerated fleet renewal (16-year renewal): Scrappage and retrofit programs lead to 100% HDVs meeting **Euro/China VI** 16 years after implemented.

Euro/China VII: Equivalent to California's 2027 standards (90% NOx reduction)

Euro VII + Accelerated fleet renewal (16-year renewal)

已发布政策: 包括已发布政策的影响 (即欧/国 VI)

已发布政策 + 车队加快更新 (更新周期 : 16年): 车队淘汰、替换和更新政策使100%的在用重型车在欧/国VI实施的 16 年后全部达到此标准。

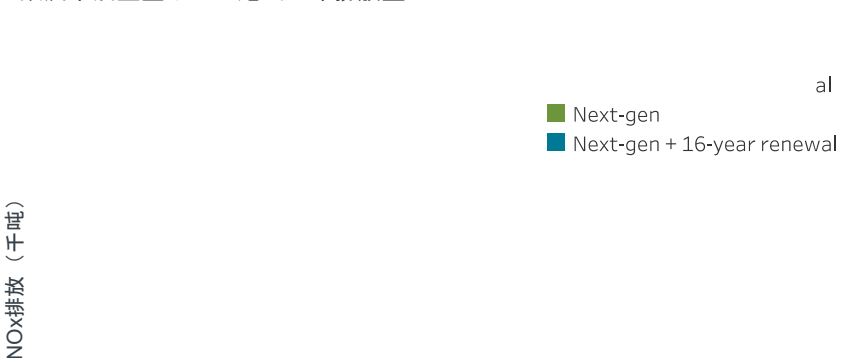
下一代排放标准 (欧/国 VII) : 对标美国加州2027年标准 (NOx减排90%)

下一代排放标准 (欧/国 VII) + 车队加快更新 (更新周期 : 16年)

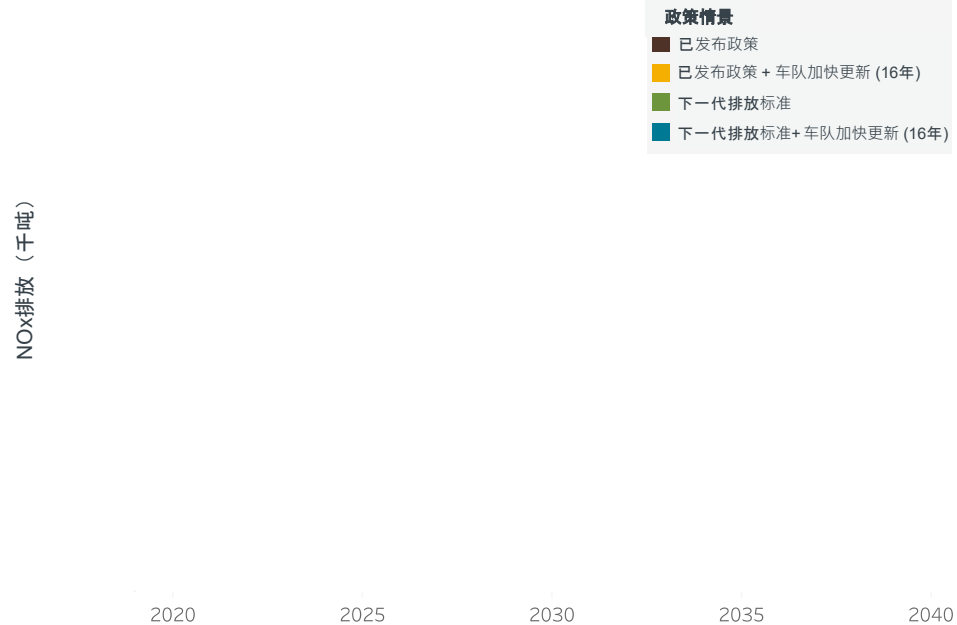
HDV NOx emissions results

重型车 NOx 排放

欧洲柴油重型车NOx尾气全年排放量



中国柴油重型车NOx尾气全年排放量



图中数据标签显示2040年不同政策情景NOx排放相对于已发布政策情景的减排百分比

HDV BC emissions results

重型车黑碳排放

欧洲柴油重型车尾气黑碳全年排放量

中国柴油重型车尾气黑碳全年排放量

黑碳排放 (千吨)

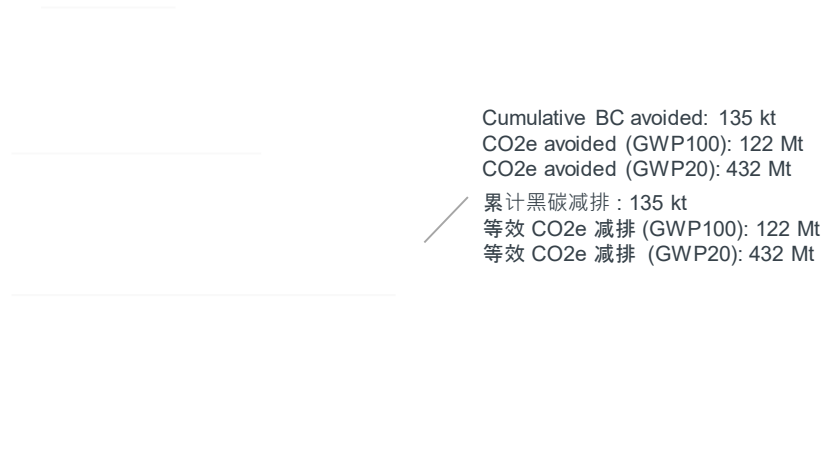
黑碳排放 (千吨)



政策情景

已发布政策 + 车队加快更新 (16年)

已发布政策



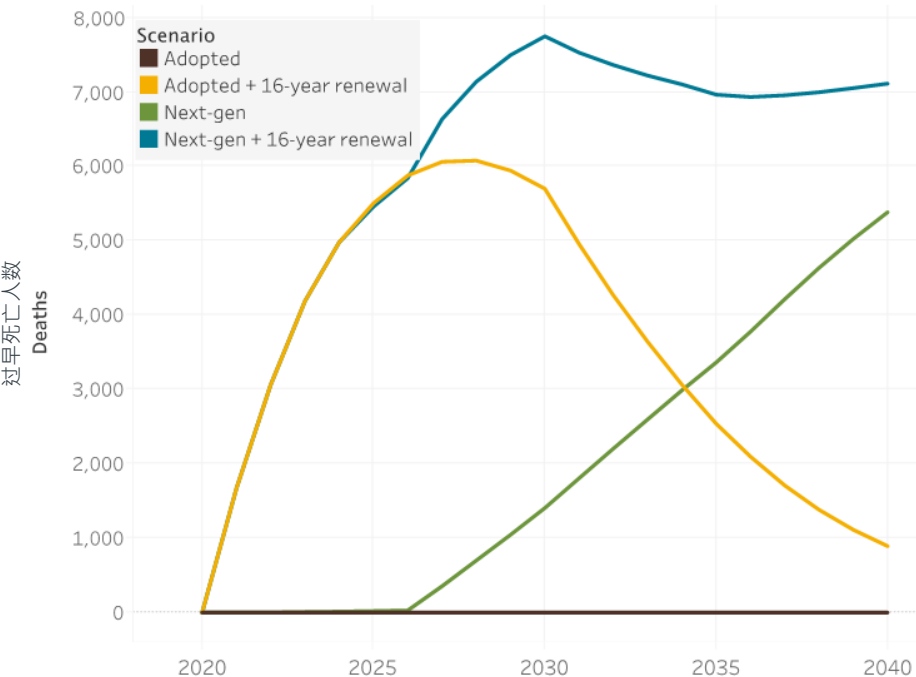
图中数据标签显示2040年不同政策情景NOx排放相对于已发布政策情景的减排百分比

Avoided PM_{2.5} and ozone attributable premature deaths

可避免的由PM_{2.5} 和臭氧引起的过早死亡人数

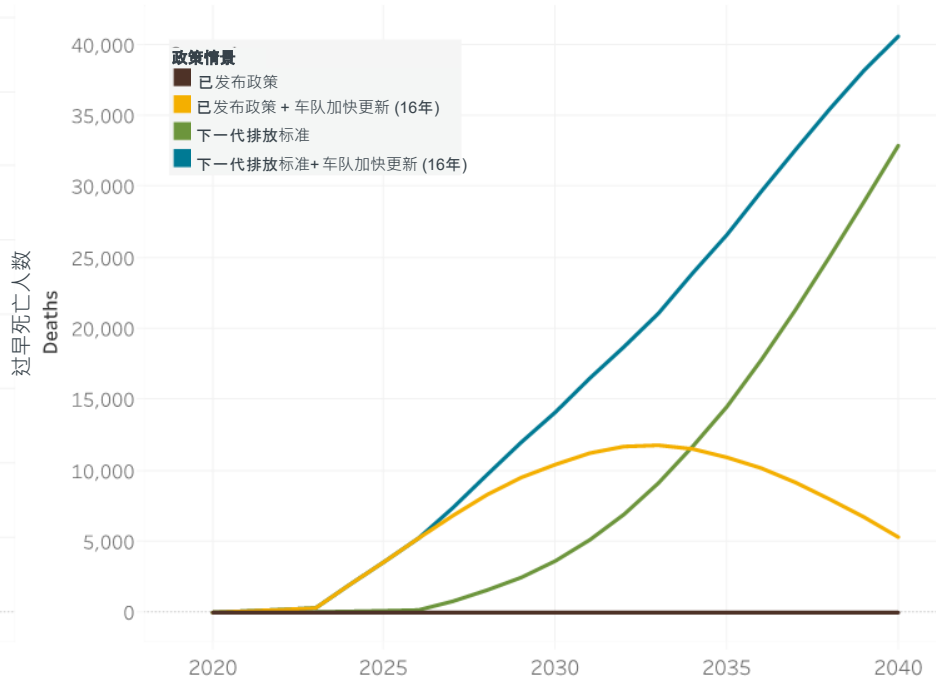
欧盟每年减少过早死亡人数

Avoided annual premature deaths, EU



中国每年减少过早死亡人数

Avoided annual premature deaths, China



Environmental and health effects go beyond NO_x

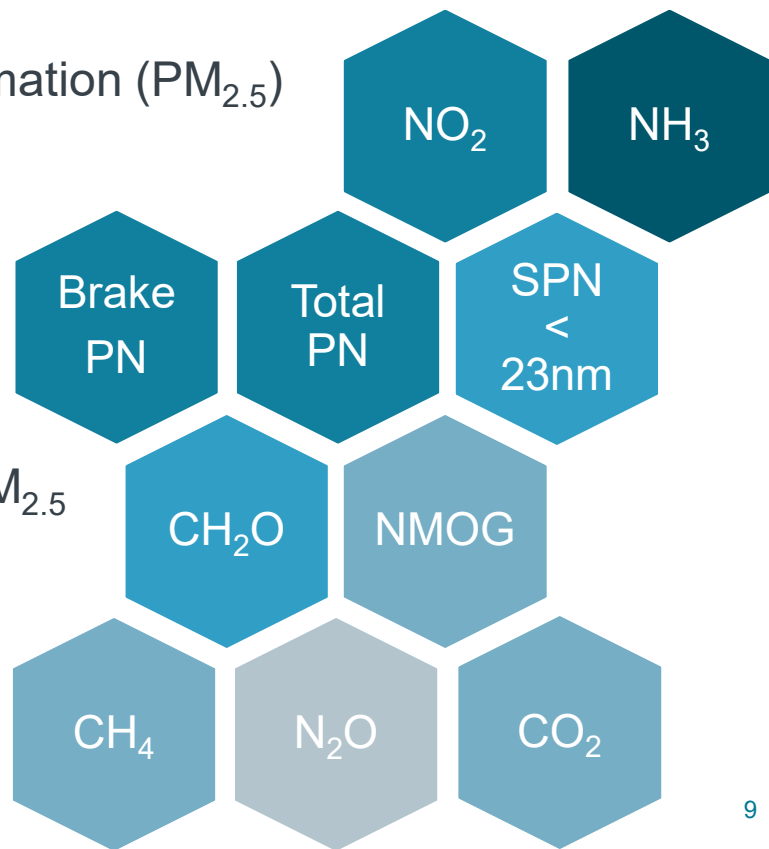
除NO_x之外的环境和健康影响

Significant precursors for secondary aerosol formation (PM_{2.5})
二次气溶胶 (PM_{2.5}) 形成的重要前体

Higher deposition in body with smaller particles
细颗粒在人体内更易沉积

VOCs are significant precursors of ozone and PM_{2.5}
VOCs是臭氧和PM_{2.5}的重要前体物

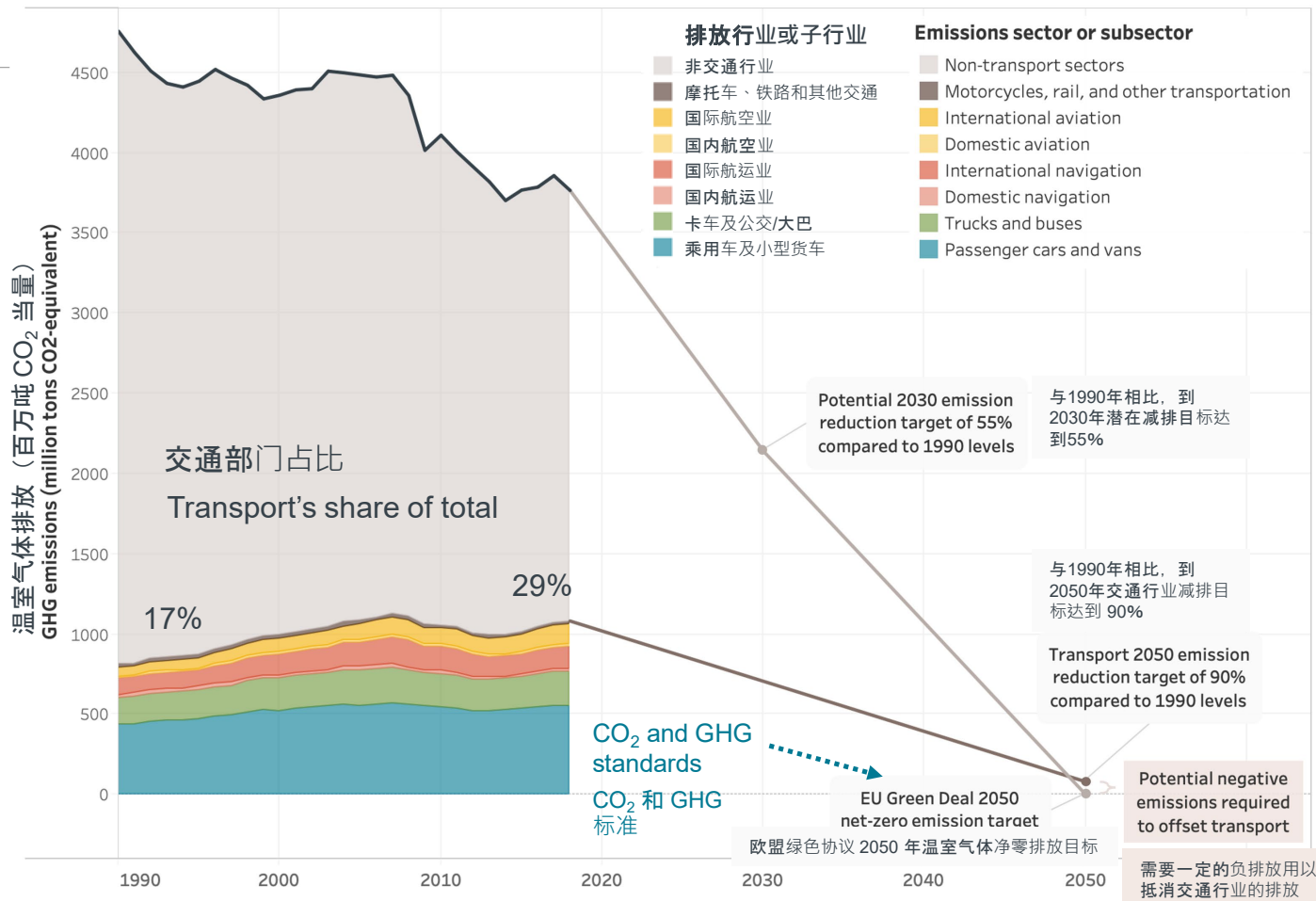
Climate pollutants
气候污染物



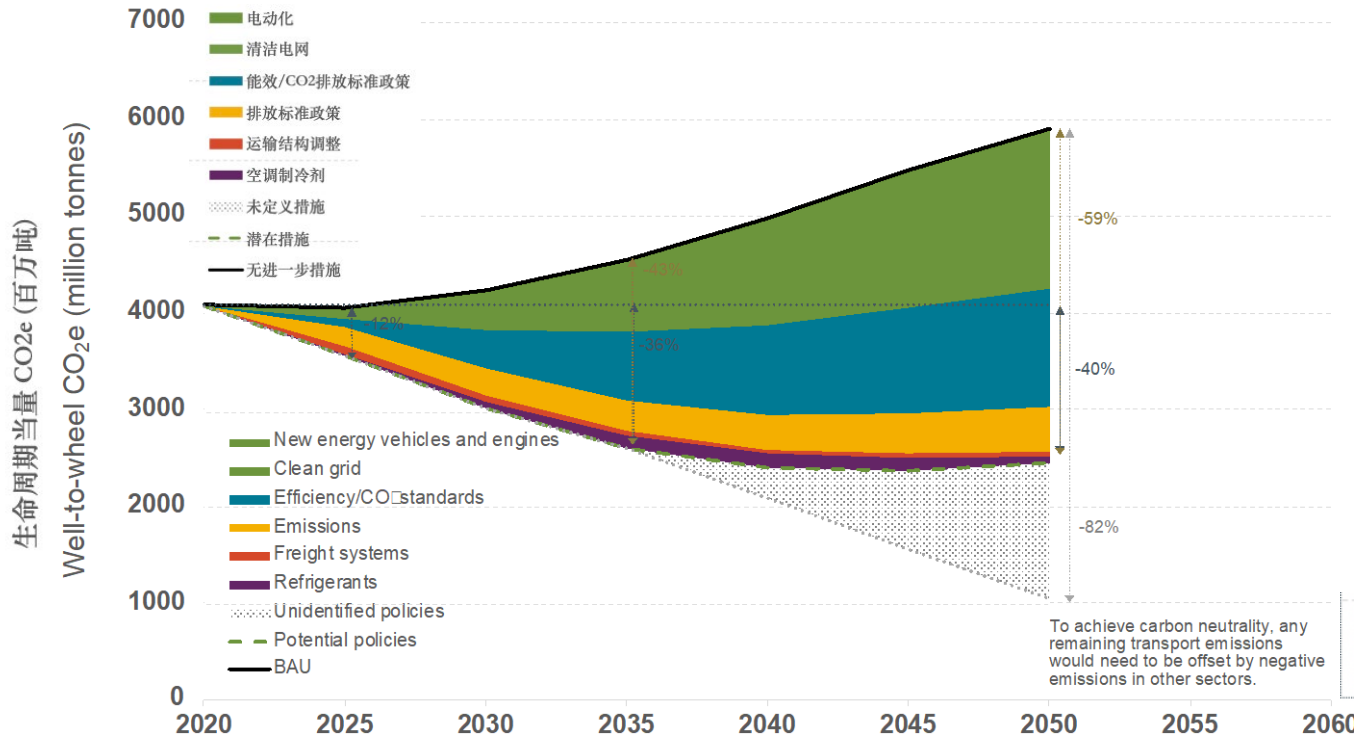
GHG emissions in the EU / 欧盟温室气体排放

Transport sector emissions remain a key challenge in achieving the EU's proposed climate targets.

来自运输部门的排放仍然是实现欧盟所倡议的气候目标的主要挑战。



GHG emissions in China / 中国温室气体排放



Transport WTW GHG (CO₂e) emissions (GWP20) under currently adopted policies and mitigation potential of potential policies, 2020-2050.

在现有政策和潜在政策情景下中国交通领域 2020-2050年温室气体排放趋势(GWP-20)

CO₂e here includes CO₂, CH₄, N₂O, HFCs, and BC
 Transport sector includes on-road, marine, rail and non-road

此分析中的CO₂e 包括了CO₂, CH₄, N₂O, HFCs, and BC
 交通部门包括了道路, 航运, 铁路和非道路

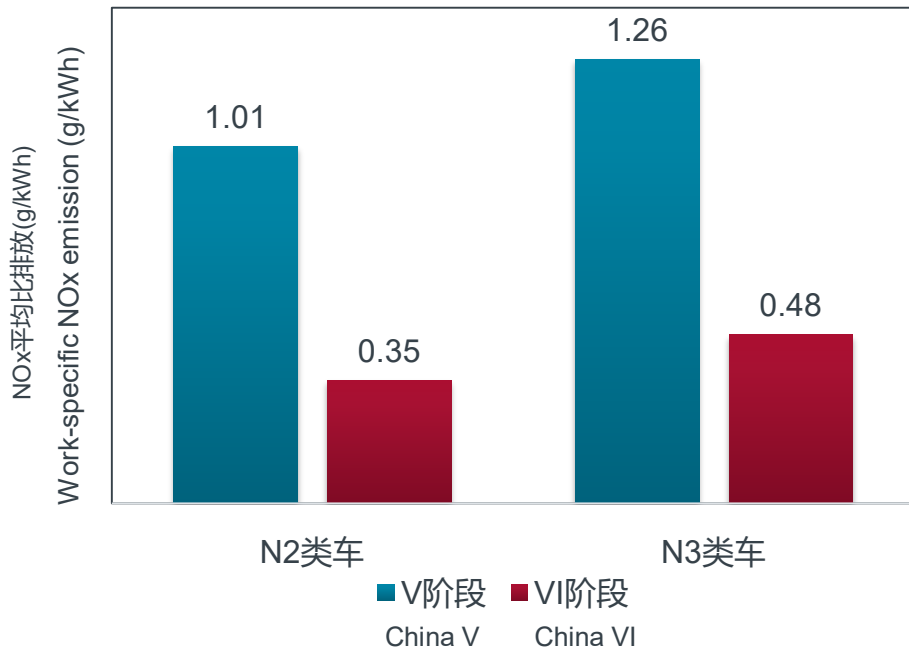
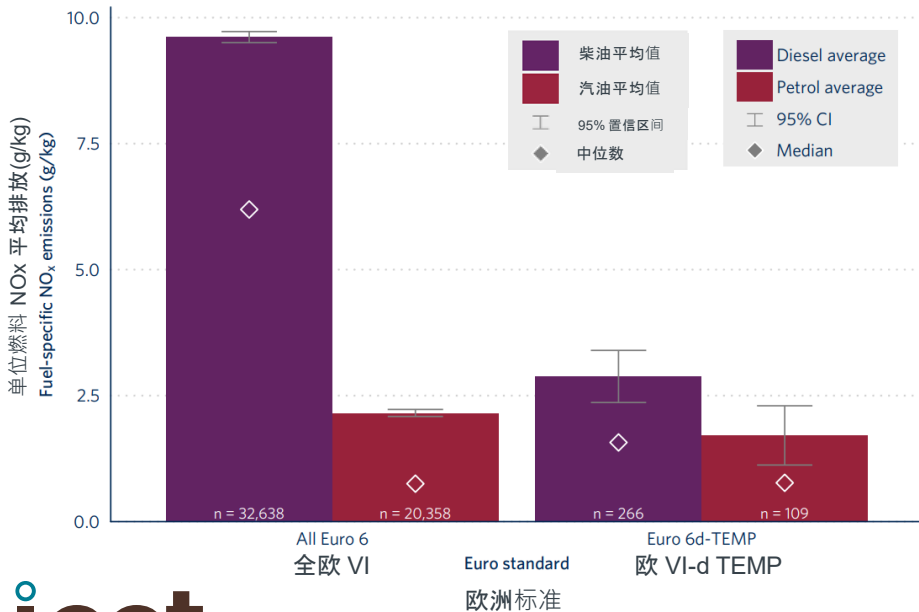
It is more than just tight emission limits
在严格的排放限值以外，还需要...

Road tests lead to significant improvements

道路测试带来重大提升

LDV, Europe - Remote sensing (ICCT)
欧洲轻型车 – 遥感

HDV, China - Remote monitoring (VECC)
中国重型车 – 远程监控



Still, the tests omit several real driving conditions

然而，道路测试依然忽略了若干实际行驶状态

But not too aggressive...
不太激进的工况

... not too hilly
测试坡度不能太陡

... not too much/little CO₂
CO₂排放不能太多又不能太少

... nor too soft
不太温和的工况

... not too slow
不能太慢

Actual real driving conditions
实际行驶状态

... and not short trips
没有短途行程

... not too warm
不能在太热的环境下测试

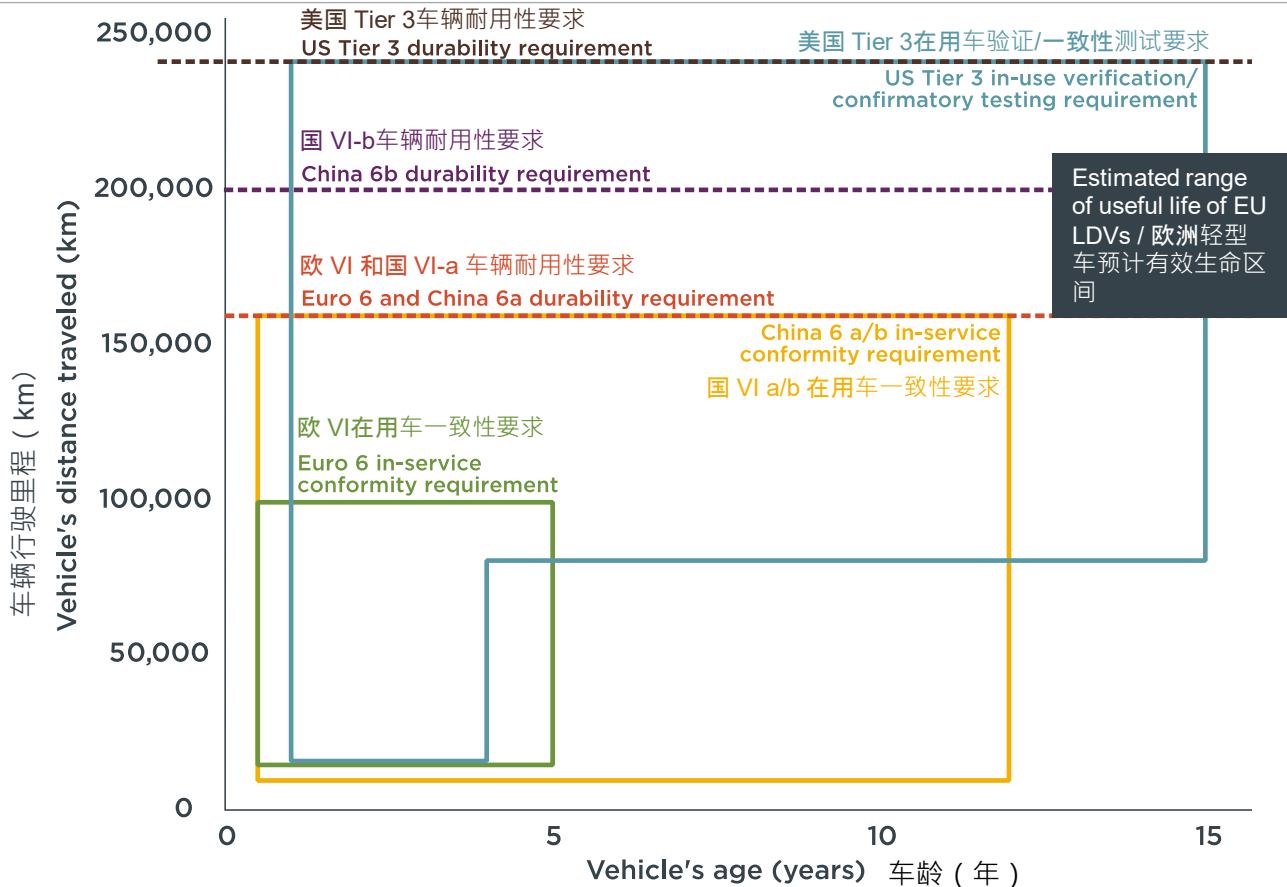
... nor too fast
不能太快

... and only so high
只在给定的海拔范围

... nor too cold
不能在太冷的环境下测试

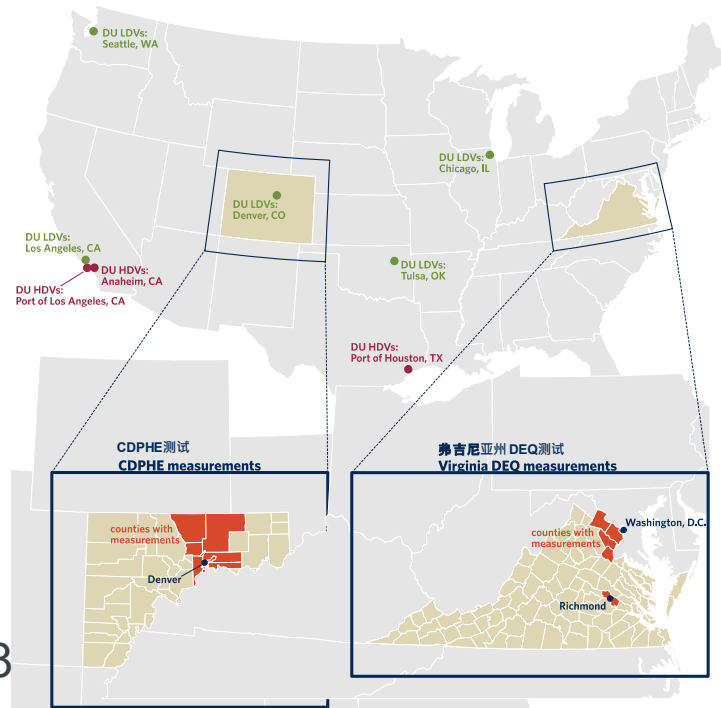
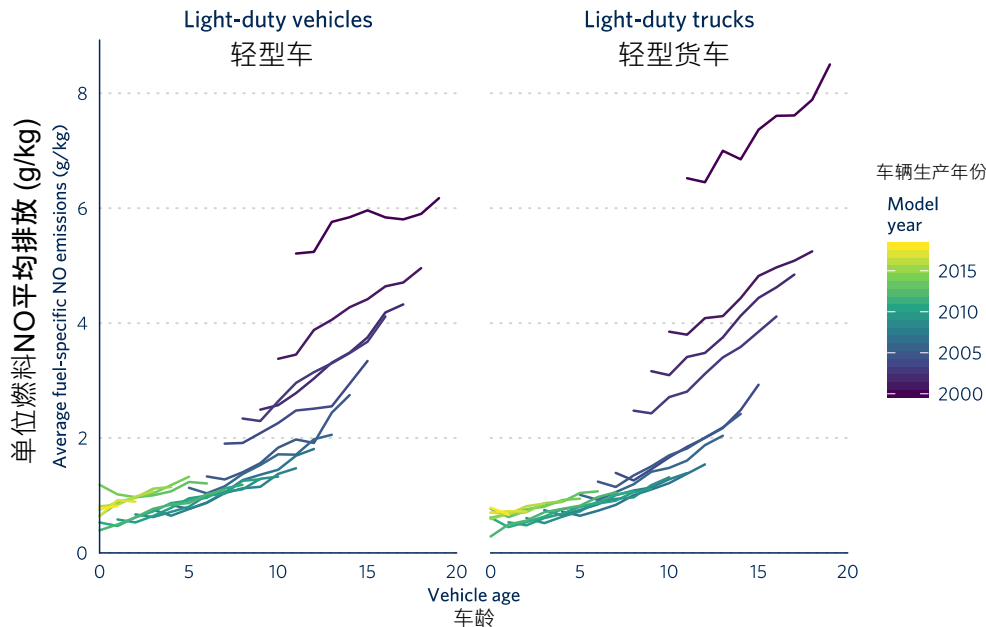
Durability, warranty and market surveillance

耐用性、保修条款和市场监测



NOx deterioration: LDVs in the U.S.

NO_x排放劣化趋势：美国轻型车



Over 50 million remote-sensing records, 2010 to 2018
根据2010年至2018年超过5000万条遥感记录所得



f.rodriguez@theicct.org

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