Hacia un transporte de carga de “cero emisiones”

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El futuro es de todos

Gobierno de Colombia

ENERGÉTICA 2030

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60 años

Empresas aliadas:

Internexa Una empresa ISA 20 años

XM Sumando energías

isa Conexiones que inspiran

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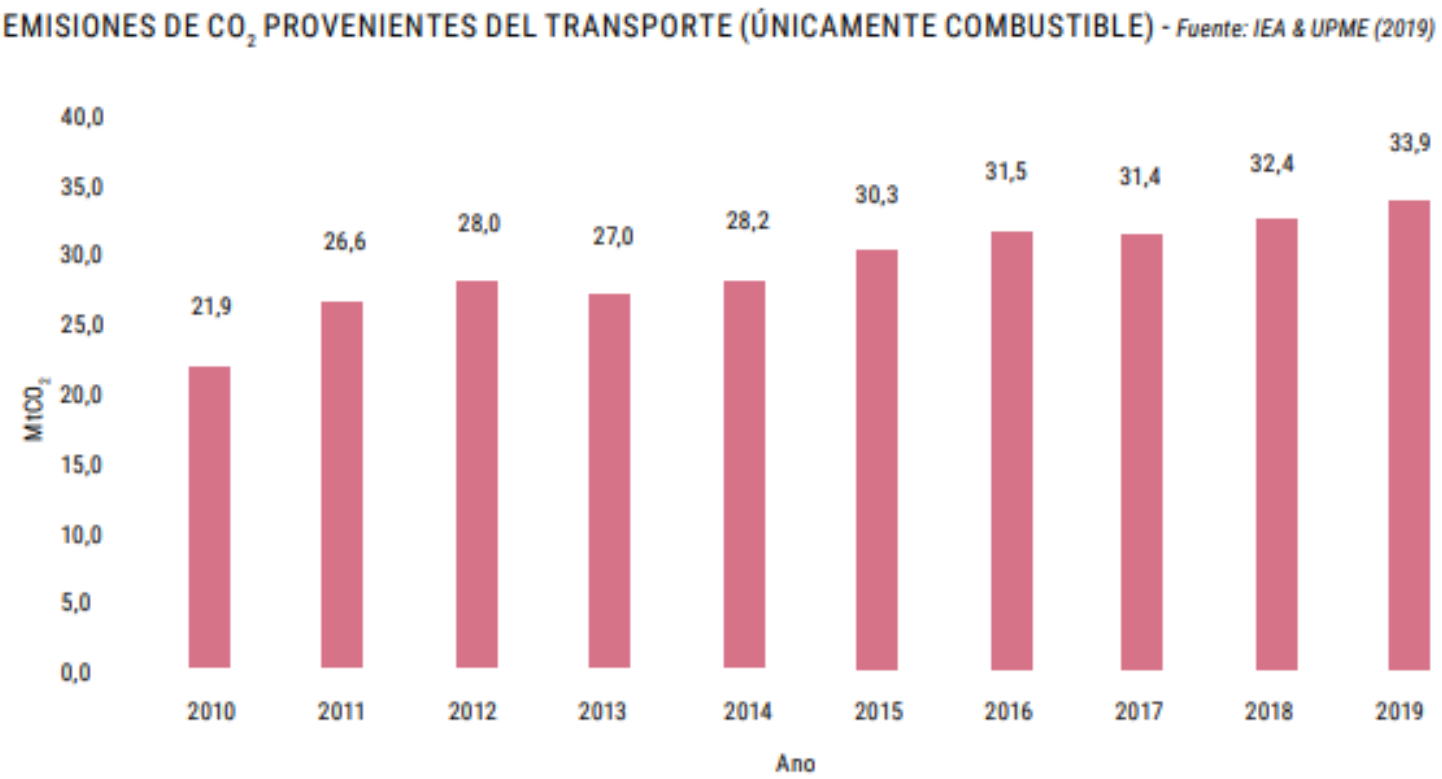
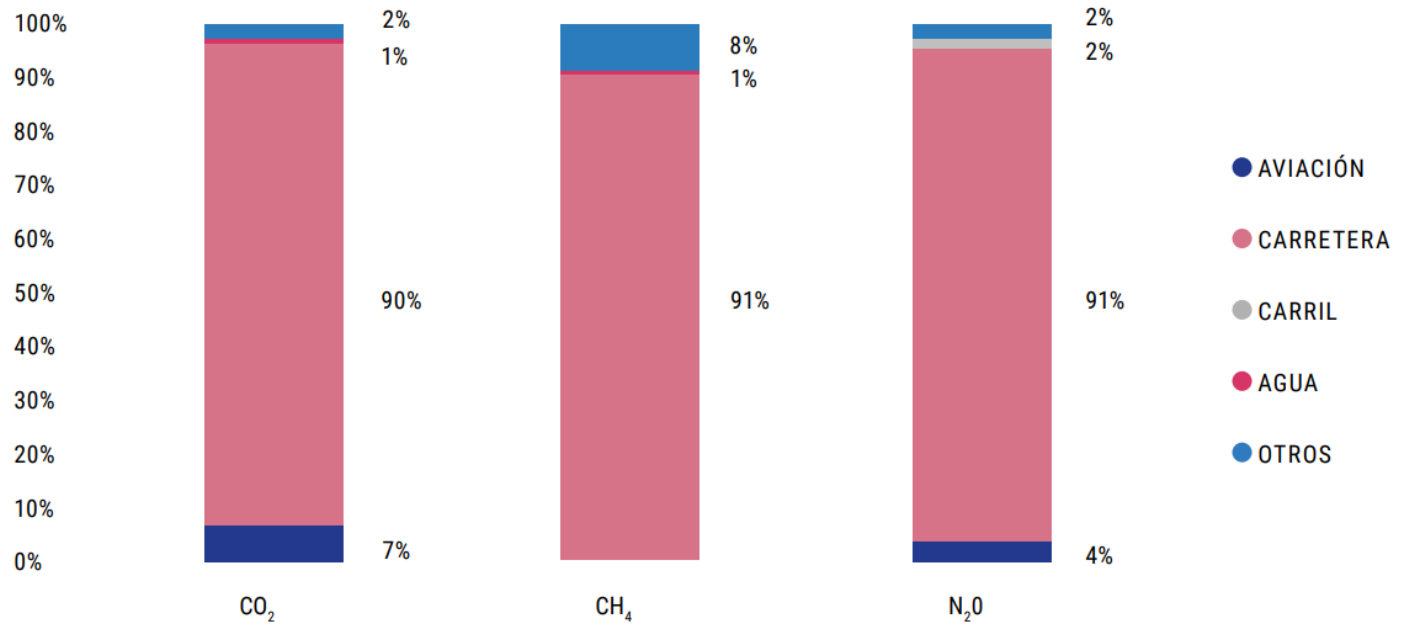
El transporte incrementa sus emisiones



Tomado de:Movilidad urbana, acceso a zonas rurales y conectividad interurbana sostenibles: Desafíos del transporte urbano para Colombia en el Siglo XXI.www.climate-change-org

El transporte por carretera emite el 90% de las emisiones

FUENTES DE EMISIONES POR SUBSECTOR DEL TRANSPORTE - *Fuente: PNUD & IDEAM, 2018*



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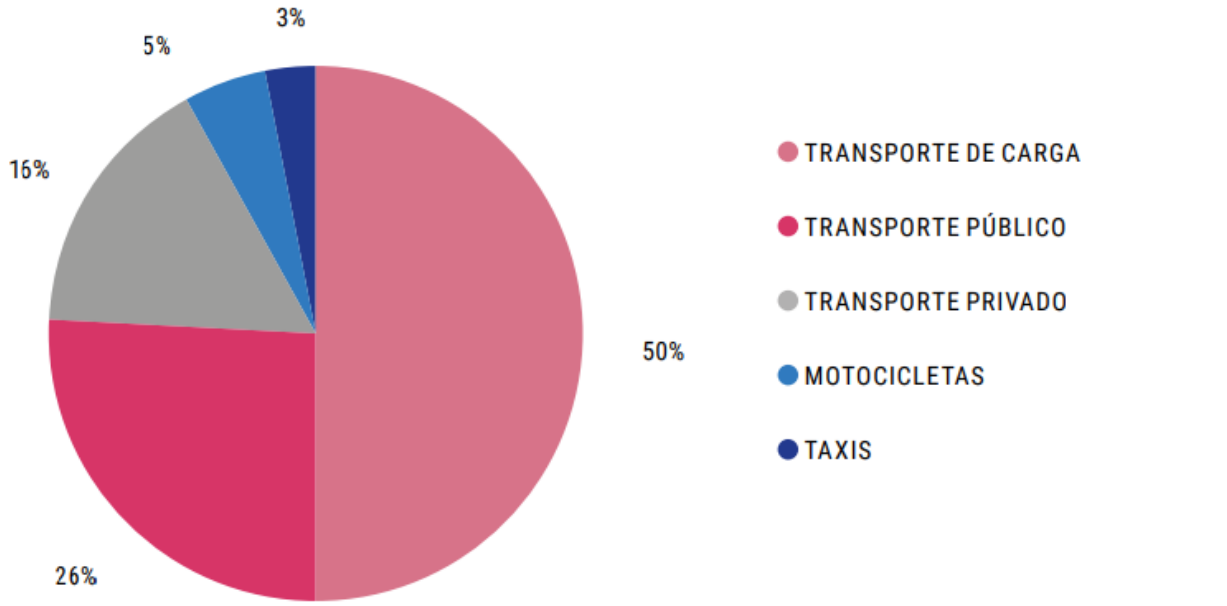
El 50% de las emisiones son debidas al transporte de carga

EMISIONES DEL SECTOR DE TRANSPORTE VIAL POR MODO - *Fuente: Ministerio del Transporte, 2018*



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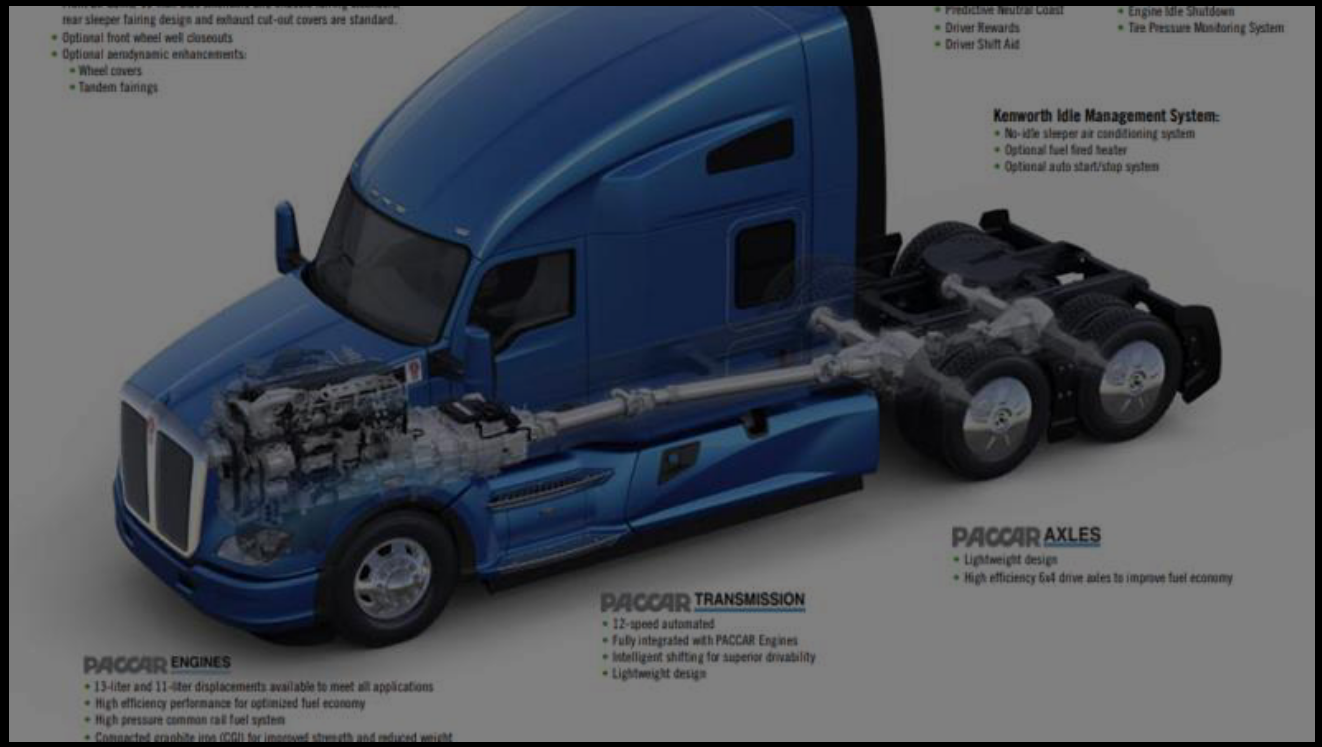
¿Estamos listos para el transporte de carga con cero emisiones?

Caso

ENERGÉTICA 2030

Tractomula Diesel



Tractomula eléctrica

PERFORMANCE

The new zero emission Kenworth T680E is the company's first-ever, Class 8 battery-electric truck.

CHARGING AND POWER SYSTEM

The T680E uses a CCS1 DC fast charger with maximum rate of 120 kWh and estimated 3.3-hour charging time.

- ePTO Available
- Battery Size - 396 kWh
- DC Fast Charging
- SAE J1772 CCS1
- Max Rate: 120 kW

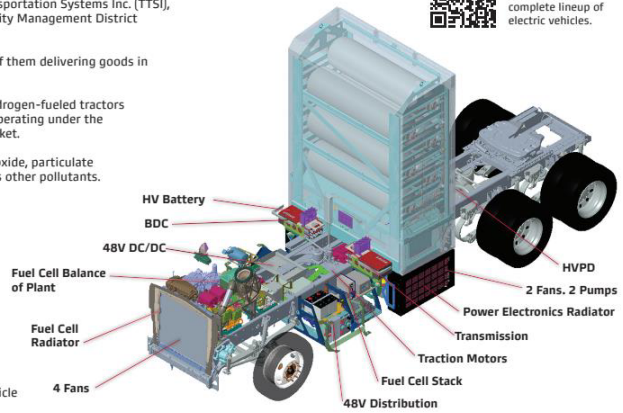
Tractomula Hidrógeno

T680 Fuel Cell Electric Vehicle

Port of Los Angeles Piloting T680 Hydrogen Fuel Cell Electric Trucks

- 10 T680 FCEVs built as part of $82.5M Shore-to-Store project
- Featured partners include Toyota Motor North America, Shell Oil Products U.S. (Shell), Toyota Logistics Services, UPS, Total Transportation Systems Inc. (TTSI), Southern Counties Express, South Coast Air Quality Management District (AQMD), and the Port of Hueneme.
- Trucks are operating in Los Angeles, with some of them delivering goods in disadvantaged communities.
- Program will study the technical feasibility of hydrogen-fueled tractors and battery-electric cargo handling equipment operating under the rigorous demands of the Southern California market.
- Program will measure the reduction of nitrogen oxide, particulate matter, and greenhouse gas emissions, as well as other pollutants.
- Truck Specs:
  - Model – T680 FCEV (Fuel Cell Electric Vehicle)
  - Fuel Cell – Twin Toyota Hydrogen Fuel Cells
  - Fuel Cell-Electric Power System –
    - 420kW (560hp) Electric Traction Motor
    - 12kW-h LI-Ion Battery
  - Range – 300 miles
  - Hydrogen Storage System
    - Hydrogen Fuel System
    - Spun Carbon Fiber Tanks
    - 10,000 psi Operating Pressure
    - 60kg Hydrogen Capacity
  - Refill Time – 15 minutes
  - Transmission – Eaton 4-speed HD Electric Vehicle

Scan for more information on Kenworth's complete lineup of electric vehicles.



En resumen

	Diesel	Eléctrico	Hidrógeno
Autonomía	980 km /1960 km	240 km	480 km
Tiempo de abastecimiento	10 -15 min	3.3 horas	15 min
Peso de energético+motor	2.6 Ton	13.5 Ton	2 Ton

Fuente: Elaboración propia

¿Cuando tendremos transporte de carga por carretera con cero emisiones?

Decarbonizing Medium- & Heavy-Duty On-Road Vehicles: Zero-Emission Vehicles Cost Analysis

Catherine Ledna, Matteo Muratori, Arthur Yip, Paige Jadun, and Chris Hoehne

March 2022

- With continued improvements in vehicle and fuel technologies (in line with U.S. Department of Energy targets and vetted with industry), **zero-emission vehicles (ZEVs) can reach total-cost-of-driving parity with conventional diesel vehicles by 2035** for all medium- and heavy-duty (MD/HD) vehicle classes (without incentives).
- Assuming economics drive adoption, **ZEV sales could reach 42% of all MD/HD trucks by 2030**, reflecting lower combined vehicle purchase and operating costs (using real-world payback periods).
- In this scenario, ZEV sales reach >99% by 2045, and **80% of the MD/HD stock transitions to ZEVs by 2050, reducing CO_2 emissions by 69% from 2019.**
- **Two technological solutions**—battery electric vehicles (BEVs) and fuel cell electric vehicles (FCEVs)—are viable in multiple market segments, offering **alternative pathways for decarbonization**.
  - **BEVs tend to become cost-competitive** for smaller trucks before 2030 and for short-haul (<500-mile) heavy trucks before 2035.
  - **Hydrogen FCEVs** tend to become cost-competitive for long-haul (>500-mile) heavy trucks by 2035.

Por ahora mejorar la eficiencia

Tabla 1 Ventajas del transporte de carga fluvial y férreo. Tomado de (Conpes, 2020).

Para transportar 1.600 toneladas se requiere:		**Distancia para transportar una tonelada de carga con un litro de combustible**	
Fluvial	1 barcaza	Barcaza	251 km
Férreo	40 vagones de 40 t	Tren	101 km
Carretero	80 camiones de 20 t	Camión	29 km

GRACIAS

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