More than just the tailpipe -- true environmental cost of travel

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Trains, planes, buses and automobiles do not only effect the environment via their exhaust pipes. There is a full life-cycle of processes associated with getting from a to b that we rarely acknowledge.

Published in IOP Publishing's *Environmental Research Letters*, researchers from the Department of Civil and Environmental Engineering at the University of California, Berkeley, have created a framework to help us calculate the true environmental cost of travel.

The new framework incorporates less-considered environmental impacts including the damage done by the power plants generating electricity for train travel and upkeep of train stations to the intensive energy costs of airport runway construction and ore extraction undertaken to build a car.

The catalogue of emissions that the researchers have compiled are taken from their own American context but the concept and framework is applicable universally - looking at the full range of vehicles, from hatchbacks and pick-ups to light and heavy railways, small aircrafts and jumbo jets.

From cataloguing the varied environmental costs the researchers come to some surprising conclusions. A comparison between light railways in both Boston and San Franciso show that despite Boston boasting a light railway with low operational energy use, their LRT is a far larger greenhouse gas (GHG) emitter because 82 per cent of the energy generated in Boston is fossil-fuel based, compared to only 49 per cent in

San Francisco.

Total life-cycle energy inputs and GHG emissions contribute an additional 155 per cent for rail, 63 per cent for cars and buses, and 32 per cent for air systems over vehicle exhaust pipe operation.

The researchers also touch on the effect of low passenger occupancy and show that we are nad′ve to automatically assume one form of transport is more environmentally friendly than another. They conclude from their calculations that a half-full Boston light railway is only as environmentally friendly, per kilometre traveled, as a midsize aircraft at 38 per cent occupancy.

Mikhail Chester, researcher at Berkeley, said, "This study creates a framework for comprehensive environmental inventorying of several modes and future assessment of non-conventional fuels and vehicles can follow this methodology in creating technology-specific results.

"Through the use of life-cycle environmental assessments, energy and emission reduction decision-making can benefit from the identified interdependencies among processes, services and products."

Source: Institute of Physics (news : web)