

# Life Cycle Assessment for Carbon Reduction

## COMPREHENSIVE CARBON IMPACT

Policy and regulations centered around Life Cycle Assessment (LCA) in transportation and manufacturing will help to provide a sustainable and mutually beneficial framework for reducing emissions, increasing investments in new technology, and re-stimulating growth in the job market. Focusing on the overall carbon footprint of industry will better position regulators and the market to evaluate the long-term environmental impact of options, and plan for a sustainable economic and environmental future.

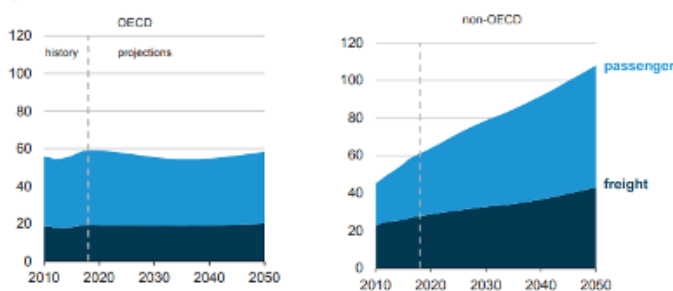
The goal of environmental policy and carbon management strategy is clean air and the elimination of pollutants, we must adjust and track our actions to that goal. Energy demand will continue to grow globally, and there is no single current source that will provide the energy needed. Rising global energy consumption will impact efforts to de-carbonize any economy, and countries will increase their population's access to affordable energy through the most cost-efficient way. The outlook for energy use for transportation shows continued high use of liquid hydrocarbons for fuel, with steady but minimal growth in the electric vehicle market.

### Developing Life Cycle Assessment Tools to Guide Sound Policy

- Develop government-wide program to shrink our federal carbon footprint – Appropriations request for 2021 and possible coordination with American Energy Innovation Act
- Partner with industry to make carbon reduction an immediate priority
- A collaborative regulatory framework that incentivizes development and accelerates adoption of advanced carbon control technologies across all energy platforms.

Energy use for passenger travel accounts for most of the growth in transportation energy consumption—

Transportation sector energy consumption  
quadrillion British thermal units

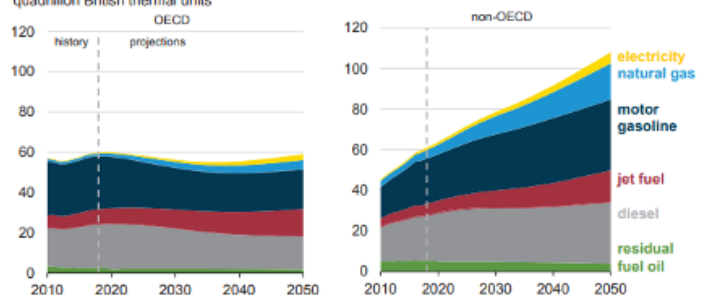


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In the Reference case, the share of transportation fuel from alternative energy sources increases through 2050—

Transportation energy consumption  
quadrillion British thermal units



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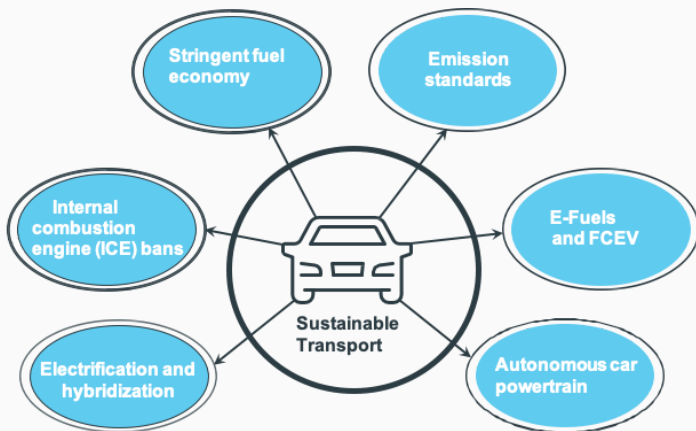
## No Single Solution Will Meet the Need of the Market

Significant focus is being placed on Internal Combustion (IC) Engine bans in some markets, and subsidies for Battery Electric Vehicles (BEV). These policies, however, do not reflect the reality of either the availability of clean power sources, or the true market dynamics at play – in the US market or abroad. Nor do they take into account the emissions reduction potential from IC Engine and Hybrid Electric Vehicles.

The use of bans and subsidies eliminates viable solutions from continued development (i.e. cleaner IC Engines) and the exploration of new solutions being developed. A holistic Life Cycle Assessment of the transportation industry is warranted to more fully understand the opportunities available to the transportation market to completely address the needs and reach the end goal of clean air and the elimination of pollutants.

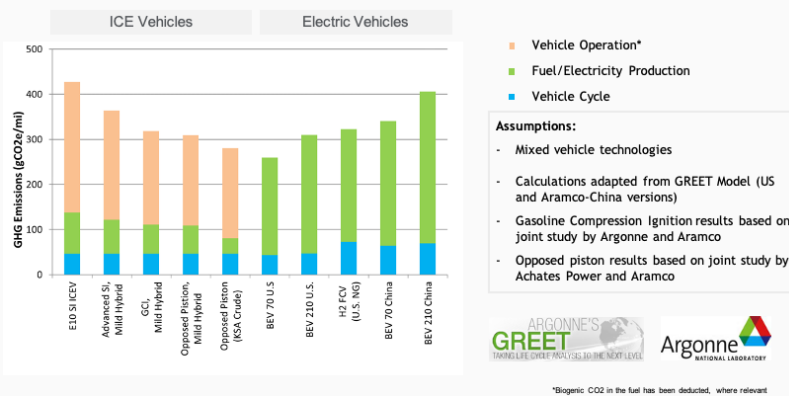
Current optimism surrounding alternative forms of mobility will hinder IC Engine-based technology development, and lead to unintended consequences. IC Engine development is critical because mass impact requires mass adoption, or we risk economic conditions undermining any environmental gains.

### Transportation Trends



The future of power requires a multi-faceted strategy. ...power solutions must be reliable, efficient, flexible and sustainable...They also must comply with stringent emission regulations, help address climate change and be part of the solution for the energy and environmental challenges facing the planet.  
 Dr. Wayne Eckerle, Vice President, Global Research and Technology, Cummins Inc.

## Life Cycle Assessment: Cradle to Grave Emissions



Policy should create a collaborative regulatory framework that incentivizes development and accelerates adoption of advanced carbon control technologies across all energy platforms. Such steps will help us to move beyond unrealistic goals that will undermine future private sector investment and hinder real global carbon reduction. By including consumer acceptance, the current availability of technology, and risk assessment our policy will be more robust and able to weather natural and unplanned disruptions.