

**Deloitte.**

# Global Mobility: From ICE to ACES

Yvonne Zhang

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# ICE vs ACES Vehicles

Factors	China	Germany	India	Japan	Rep. of Korea	South-east Asia	US
Lower fuel costs	50%	50%	63%	62%	64%	68%	66%
Concern for the environment	46%	45%	68%	36%	43%	61%	53%
Less maintenance	36%	27%	56%	15%	48%	47%	35%
Driving experience	60%	29%	53%	31%	39%	47%	34%
Government incentives/subsidies/ stimulus programs	47%	30%	48%	34%	51%	39%	31%
Concern about personal health	45%	18%	50%	12%	20%	44%	19%
Ability to use the vehicle as a backup battery/power source	33%	17%	43%	30%	24%	35%	17%
Potential for extra taxes/levies applied to internal combustion vehicles	26%	21%	30%	12%	24%	29%	16%
Potential ban on sale of new internal combustion vehicles	17%	24%	24%	13%	14%	19%	14%
Peer pressure	7%	6%	10%	4%	6%	11%	3%
Other	0%	2%	0%	1%	0%	0%	3%

- + Software vs hardware defined mobility
- + ICE cars emit pollutants such as CO2, NOx, and particulate matter while ACES vehicles have low or zero emissions.
- + ACES vehicles are quieter, smoother, and more efficient than ICE cars, they operate more like a smart phone with Ai and connected remote service features
- + The cost of ownership and operation of ACES vehicles is lower than ICE cars over their lifetime
- + Subscription models of ACES vehicles battery swap schemes and technical feature subscription open new more inclusive business models

# Resilience & safety

- + ACES catalyses decentralised renewable power infrastructure development to adapt to climate impact
- + Data driven safety & resilience against physical risks of climate change

## Powerstack Solar Pole

The Powerstack Solar Pole is a self-sufficient unit that captures and utilizes solar energy, ensuring continuous operation without reliance on access to the power grid. Its integrated battery system is designed for long-term performance, providing more than 10,000 cycles of charged energy storage, facilitating uninterrupted service even in remote or off-grid locations.



### Attributes

- Robust and resilient design: Engineered for durability extreme weather conditions, from intense heatwaves: design conform to stringent standards, enabling it to (Category D cyclones) and corrosive environments, e to structural integrity

### INTELLIGENT FOR ROAD SAFETY

## Driver behaviour monitoring with Computer Vision technology: an effective control option for road safety

### The situation

Driver and driver behaviour risk has seen an increase in poor driver behaviour and vehicle incidents. The control and risk owners are looking to improve driver behaviour control by improving the usefulness of data capture, gaining further insights and getting visibility on vehicles that violate safety restrictions.

### The challenge

#### Key controls to manage this risk include:

Mobile speed radar trailers provide real time speed detection and feedback to drivers.

Vehicle Monitoring Systems (IVMS) is only available for certain types of vehicles, and not in a format that is easy to analyse or report on.

IVMS data is dumped onto department managers to manually filter on and issue warning or disciplinary action.

Annual hand-held speed radar detection activity can be conducted by an external traffic control company for approximately \$25k annually.

IVMS design features, such as: speed limits, signage, speed limits, signage, etc.

### The complication and limitations

- No useful data is captured, retained or analysed providing no opportunity for recourse.

- Staff and contractors do not receive driver behaviour feedback.

- No longitudinal driver analysis is possible.

- IVMS is not a requirement for all vehicles, and while there's typically good coverage within the company owned fleet, this is not the case for contractors.

- Currently, only speed infringements are being recorded and actioned with the available IVMS data, leaving many other alert types unactioned.

- Often no digitised data is captured that can be retained for subsequent data analysis or insights.

- 3rd party road safety audits are infrequently conducted (sometimes only every three years).

### The opportunity

- Capture better quality and more automated Computer Vision camera hardware.

- Setup a range of different camera angles to improve driver feedback.

- Additional CV models can be used to capture data on loads on trays, pedestrian adherence

- Close the gap in identifying poor driver behaviour by merging gate entry camera data with vehicle registration data

- Extract further data from IVMS such as cornering, stopping and starting

- Enable additional analysis of IVMS data for journey management policies

- Eliminate infrequent and manual road safety audits by automating with CV to provide operational 24/7.

- Leverage CV technology to provide continuous road monitoring and data

### Top reasons to choose an EV as next vehicle

Factors	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Concern for the environment	67%	53%	65%	42%	71%	64%
Concern about personal health	52%	38%	44%	23%	49%	57%
Lower fuel costs	69%	65%	79%	61%	73%	64%
Less maintenance	52%	48%	51%	44%	49%	37%
Ability to use the vehicle as a backup battery/power source	46%	44%	48%	26%	25%	36%
Peer pressure	7%	13%	8%	5%	15%	17%
Driving experience	57%	59%	49%	39%	38%	54%
Government incentives/subsidies/stimulus programs	39%	50%	32%	46%	31%	42%
Potential for extra taxes/levies applied to internal combustion vehicles	33%	31%	25%	32%	30%	22%
Potential ban on sale of new internal combustion vehicles	26%	20%	19%	18%	18%	17%
Other	0%	0%	1%	1%	0%	1%



#### Vehicle electrification

High interest rates and elevated sticker prices may be causing consumer interest in EVs to soften in some markets. Despite original equipment manufacturer (OEM) price cuts and government incentives designed to make them more affordable, a variety of other challenges continue to stand in the way, including availability of charging infrastructure, charging time, range anxiety, and cost.



#### Future vehicle intentions

Product quality tops the list of factors driving the choice of vehicle brand for consumers in most Southeast Asia markets, including Indonesia, Malaysia, Thailand, and Vietnam, while vehicle performance and price are top of mind for consumers in the Philippines and Singapore respectively.



#### Connectivity

Among those who are interested in connected vehicles, there is a relatively high level of interest in features that provide updates on maintenance, road safety, and traffic congestion. Unlike other markets, the willingness to pay extra for connected technologies remains relatively high across all Southeast Asia markets except in Singapore.



#### Vehicle subscriptions

Against the backdrop of uncertain economic conditions causing concern for financial capacity, a significant number of younger consumers in many markets are at least somewhat interested in giving up vehicle ownership altogether in favour of a subscription model, but concerns about vehicle availability, total ownership cost, and the perception of higher monthly fees persist.

# Key Findings of the Deloitte SEA Automotive Consumer Study 2024

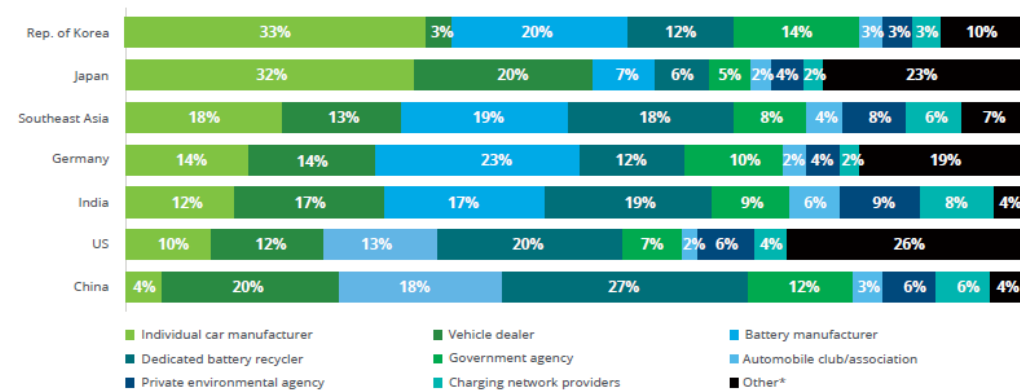
- + ACES vehicles are gaining popularity and acceptance among Southeast Asian consumers
  - Main drivers are environmental awareness, fuel efficiency, cost savings, and performance
  - Main barriers are lack of infrastructure, high upfront costs, range anxiety, and safety concerns
- + ACES vehicles are seen as a potential source of income and social impact
  - 35% of respondents are willing to share their ACES vehicles with others
- + Government policies and incentives play a crucial role in influencing consumer behaviour

# Recommendations for the Public and Private Sectors: Public Sector

- + Develop and implement a clear and consistent policy framework and roadmap for the transition to ACES vehicles
- + Align with national and regional goals for greenhouse gas emissions reduction, energy security, and economic development
- + Consider financial and non-financial incentives for ACES vehicle ownership and subscription models
- + Invest and collaborate with the private sector and other stakeholders to build and upgrade the charging or battery swap infrastructure for ACES vehicles
- + Promote and support the adoption and integration of ACES vehicles into the broader mobility ecosystem
- + Educate and engage the public and the media on the benefits and challenges of ACES vehicles for better local adaptation

A variety of stakeholders involved in the EV battery value chain should work together to develop a successful solution for collecting, storing, and recycling batteries after their useful lives.

Entity that should be responsible for collecting, storing, and recycling EV batteries after their useful lives



# Recommendations for the Public and Private Sectors:

## Private Sector

- + Innovate and differentiate ACES vehicles: design, functionality, performance, safety, convenience, and affordability
- + Collaborate and partner with the public sector and other stakeholders to co-create and co-deliver solutions and initiatives
- + Leverage and optimize data and insights from ACES vehicles to improve public safety, insurance products, climate impact adaptation, emergency response and civic services
- + Generate new revenue streams, improve operational efficiency, reduce costs, and create social impact
- + Communicate and demonstrate the value and impact of ACES vehicles on vehicle users, investors, employees servicing the mobility ecosystem, and partners throughout the value chain

Level of consumer interest in connected vehicle features (% very/somewhat interested)

Connected vehicle features	China	Germany	India	Japan	Rep. of Korea	Southeast Asia	US
Maintenance updates and vehicle health reporting/alerts	80%	54%	88%	57%	70%	82%	60%
Updates regarding traffic congestion and suggested alternate routes	80%	56%	86%	59%	74%	80%	59%
Suggestions regarding safer routes (i.e., avoid unpaved roads)	80%	46%	84%	57%	71%	78%	58%
Updates to improve road safety and prevent potential collisions	81%	52%	88%	61%	72%	81%	58%
Maintenance cost forecasts based on your driving habits	78%	48%	84%	48%	60%	76%	53%
Customized suggestions regarding ways to minimize service expenses	77%	44%	84%	51%	74%	77%	52%
Over-the-air vehicle software updates that correct operational faults or improve your driving experience	77%	46%	83%	51%	70%	75%	51%
Access to nearby parking (i.e., availability, booking, and payment)	75%	49%	86%	49%	71%	75%	46%
Customized/optimized vehicle insurance plan (e.g., "pay how you drive" plans)	70%	41%	82%	40%	65%	72%	44%

Important characteristics of a vehicle subscription

Characteristics of vehicle subscription	China	Germany	India	Japan	Rep. of Korea	Southeast Asia	US
Convenience	39%	38%	44%	49%	41%	49%	38%
Full cost control due to transparent and predictable fixed monthly fees	35%	42%	47%	41%	38%	45%	30%
Availability of vehicles	30%	33%	44%	44%	20%	44%	28%
Premium vehicles/brands offered	32%	14%	34%	9%	18%	26%	28%
Hassle-free online contract closing/full digital customer experience	24%	28%	37%	32%	23%	33%	27%
Home delivery services	26%	27%	39%	28%	22%	37%	25%
Increased flexibility	37%	30%	44%	46%	28%	40%	24%
Selection of brand-new as well as certified pre-owned vehicles	22%	19%	37%	28%	24%	32%	24%
Possibility to exchange vehicles	24%	27%	33%	29%	22%	29%	23%
Availability of complementary premium services	31%	16%	38%	13%	27%	31%	22%
Selection of only brand-new vehicles	21%	13%	32%	10%	15%	21%	22%
Possibility to subscribe to a vehicle segment instead of a specific model	25%	20%	37%	17%	16%	29%	21%
Possibility to test new vehicles for a certain period without additional costs	27%	24%	39%	33%	40%	34%	21%
Possibility to subscribe to a specific model instead of a vehicle segment	18%	19%	36%	17%	18%	25%	12%

# Conclusion

- + ACES vehicles are the future of global mobility
- + Climate adaptation and mitigation needs a better mobility solution than ICE vehicles
- + Both public and private sectors need to be involved to contribute global and local expertise, insights, and solutions for the common good of Sri Lankan communities

## Key insights from our Global Automotive Consumer Study over the years:

- 2010** • Overall value ranked as the primary factor when evaluating brands
- 2011** • “Cockpit technology” and the shopping experience-led differentiators
- 2012** • Interest in hybrids driven by cost and convenience, while interest in connectivity centers on safety
- 2014** • Shared mobility emerges as an alternative to owning a vehicle
- 2017** • Interest in full autonomy grows, but consumers want a track record of safety
- 2018** • Consumers in many global markets continue to move away from internal combustion engines (ICE)
- 2019** • Consumers “pump the brakes” on interest in autonomous vehicles
- 2020** • Questions remain regarding consumers’ willingness to pay for advanced technologies
- 2021** • Online sales gaining traction, but majority of consumers still want in-person purchase experience
- 2022** • Interest in electrified vehicles (EVs) grows, but worries about price, driving range, and charging time remain
- 2023** • The shift to EVs is primarily based on a strong consumer perception that it will significantly reduce vehicle operating costs