

Collaborative Action Points For the Auto Industry Sustainable Development

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Crude Oil
(Oligopoly Market)

[Series 1: Crude Oil Within the Context of Oligopoly Market]

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Automaker
(Cyclical Company)

[Series 2: Exploring the US EV Industry Through
the US Bicycle Sharing System]

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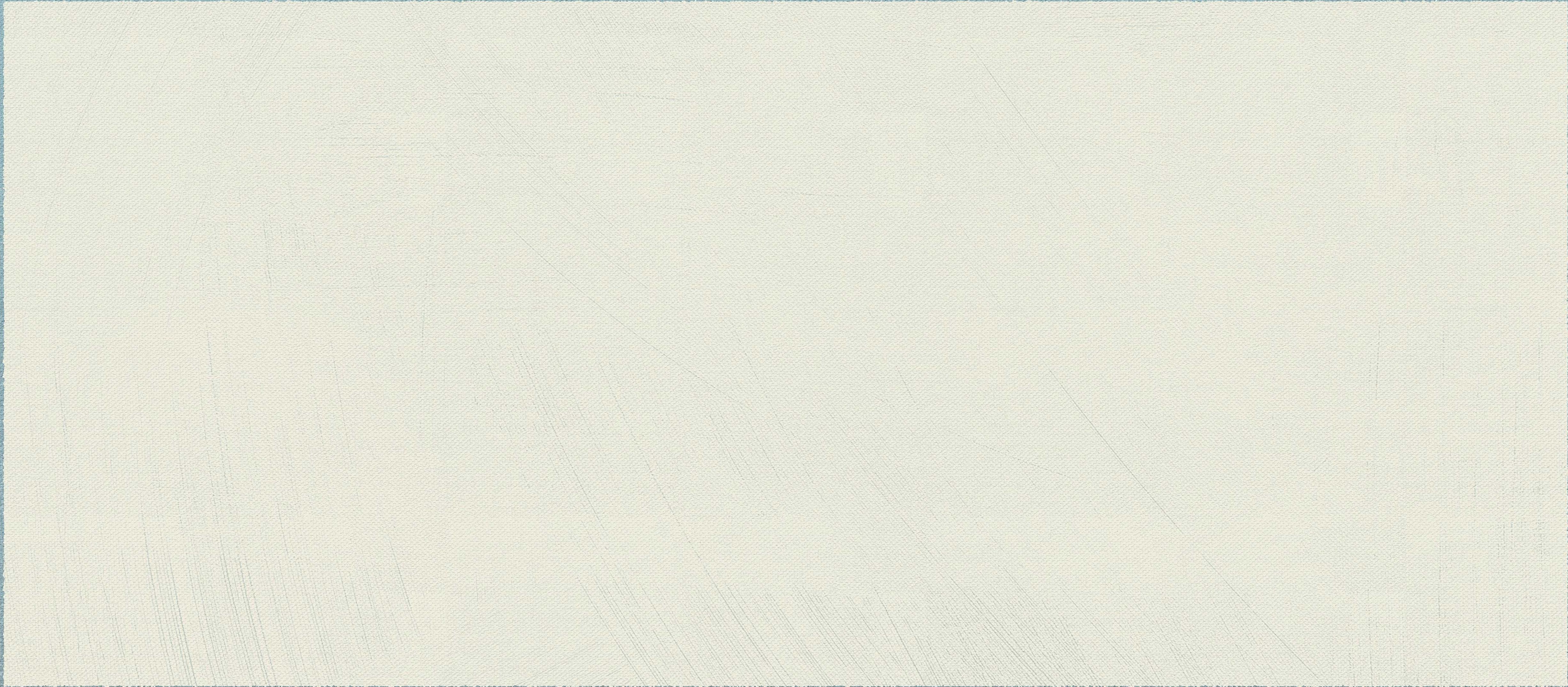
Climate Change
(Global Issue)

[Series 3: Collaborative Action Points for the Auto Industry
Sustainable Development]

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COLLABORATION

Key Findings



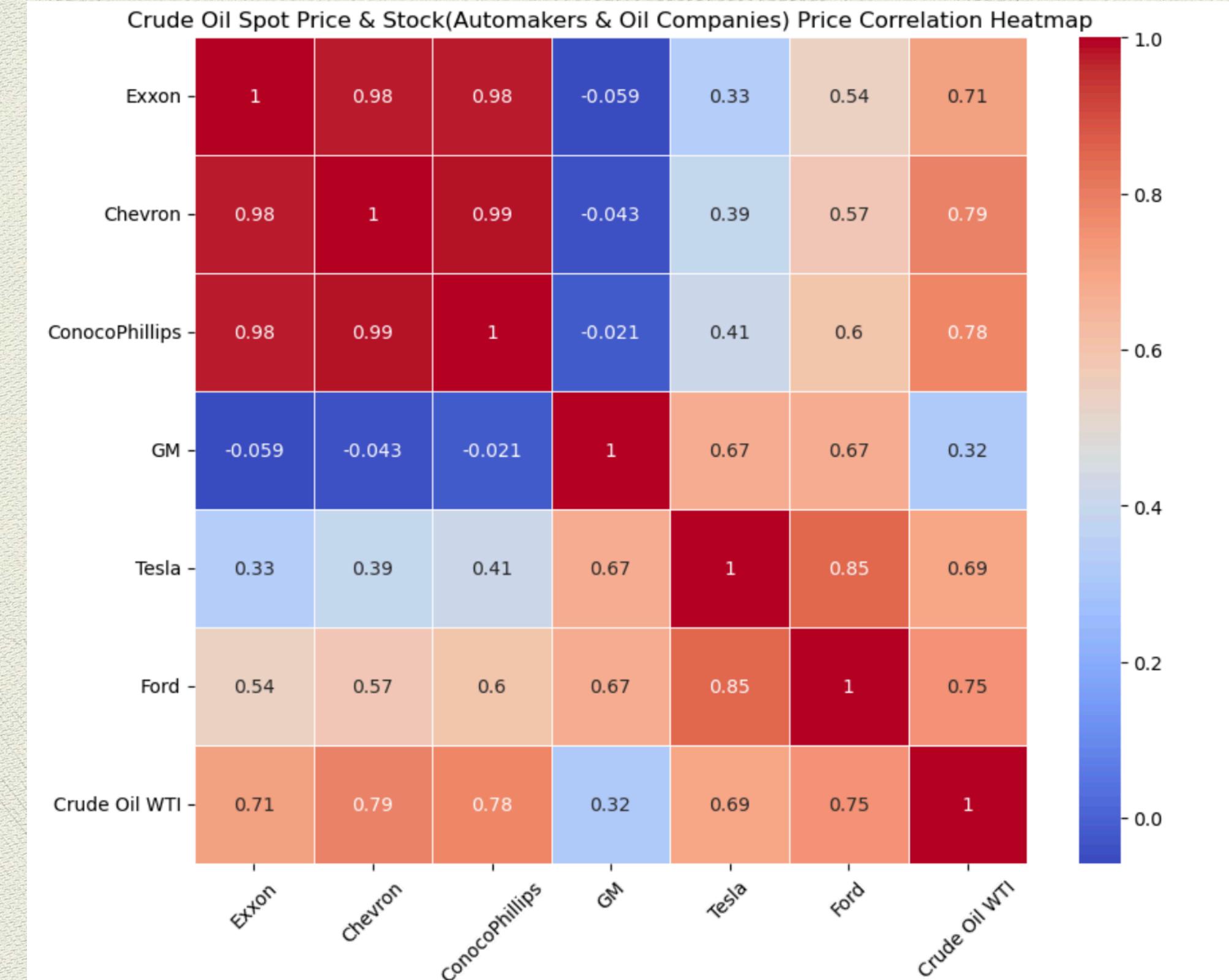
Collaborative Action Points For Related Stakeholders

Oil Companies

- “Artificial” tail risk should be avoided, given the heightened sensitivity between the stock oil prices and automakers.

1. Mitigating "Artificial" Tail Risk for The Better Economic Stability

- ◆ Adjusting oil supply amounts is recognized as suboptimal for addressing both short-term profitability concerns and long-term development challenges, including navigating the energy transition and managing stress from potential "stranded assets"
- ◆ The reliability of predicting oil prices is confirmed by a crude oil spot pricing model utilizing stable supply-side data, with an R-squared value exceeding 90%, indicating that more than 90% of the variability in weekly crude oil WTI prices can be accurately accounted for.



Source: Project Series 1 — Crude Oil Within the Context of Oligopoly Market (Link: https://github.com/florenceX5/Crude_Oil_Finance_Project.git)

Oil Companies

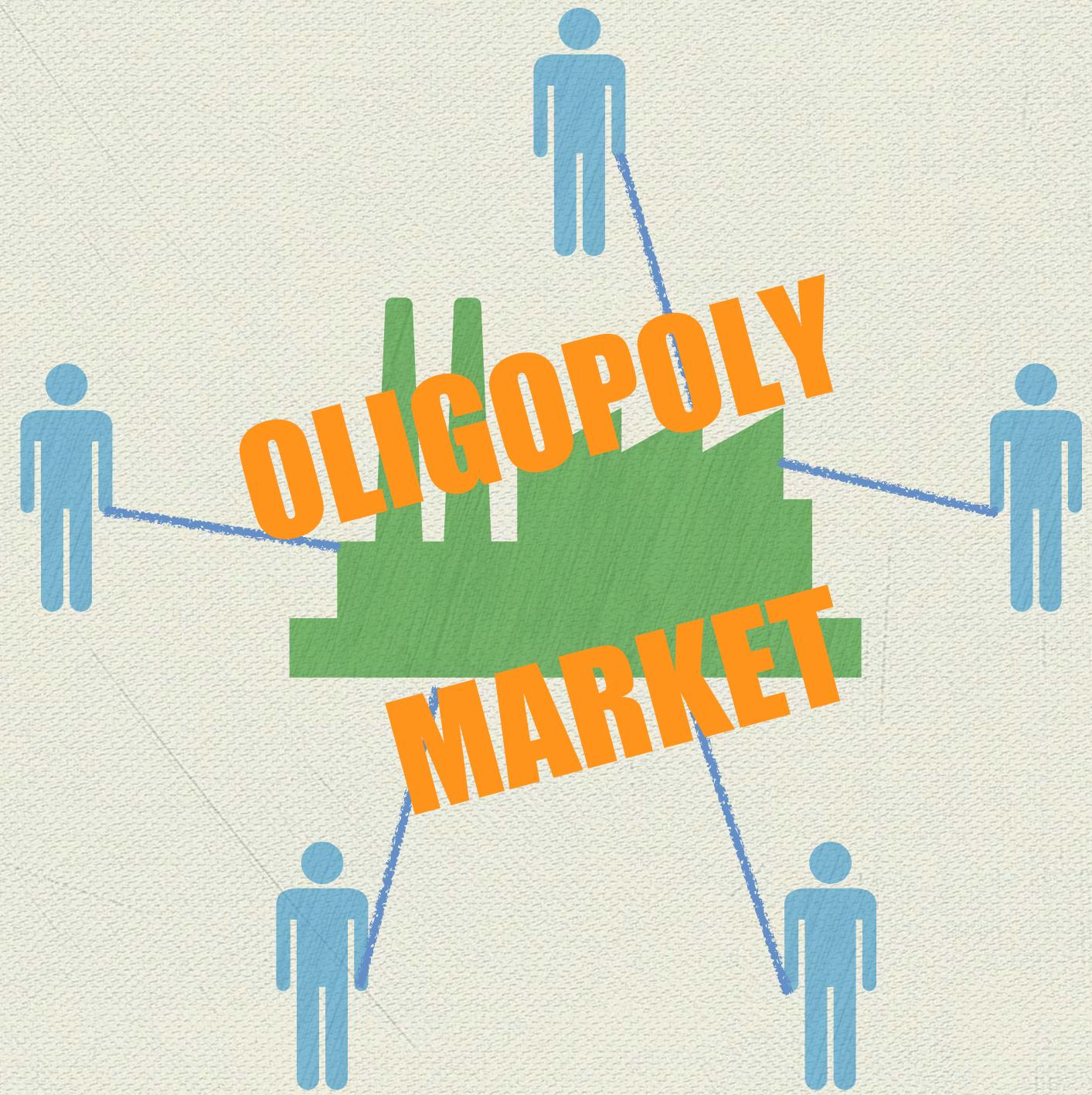
- The decline in short-term profitability should not be perceived as a loss, emphasizing the need for a more transparent schedule of oil production.

2. Redefining Short-term Profitability in the Context of the Energy Transition

- ◆ Rather than viewing the current decline in profits as a loss, it should be taken as strategic investments addressing the consequences of past actions impacting our environment and planning for a more sustainable future

3. Advocating Transparency in Oil Production Scheduling

- ◆ While a collusive pricing strategy remains characteristic of an oligopoly market, adapting to changes in the current climate, where energy types can be renewed, prompts a reconsideration of pricing strategies.



Automakers

- Strategically collaborating on hydrogen vehicle introduction and jointly funding research and development enhances efficiency in addressing challenges within the current climate environment and available technologies.

1. Strategic Collaboration for Hydrogen Vehicle Introduction

- ◆ This collaborative effort will harness the combined branding power to enhance public awareness and acceptance of hydrogen as a viable new energy vehicle option.

2. Joint Funding for Research and Development(R&D)

- ◆ Adopting a joint approach to technology innovation is more efficient for addressing the challenges posed by the current climate environment.

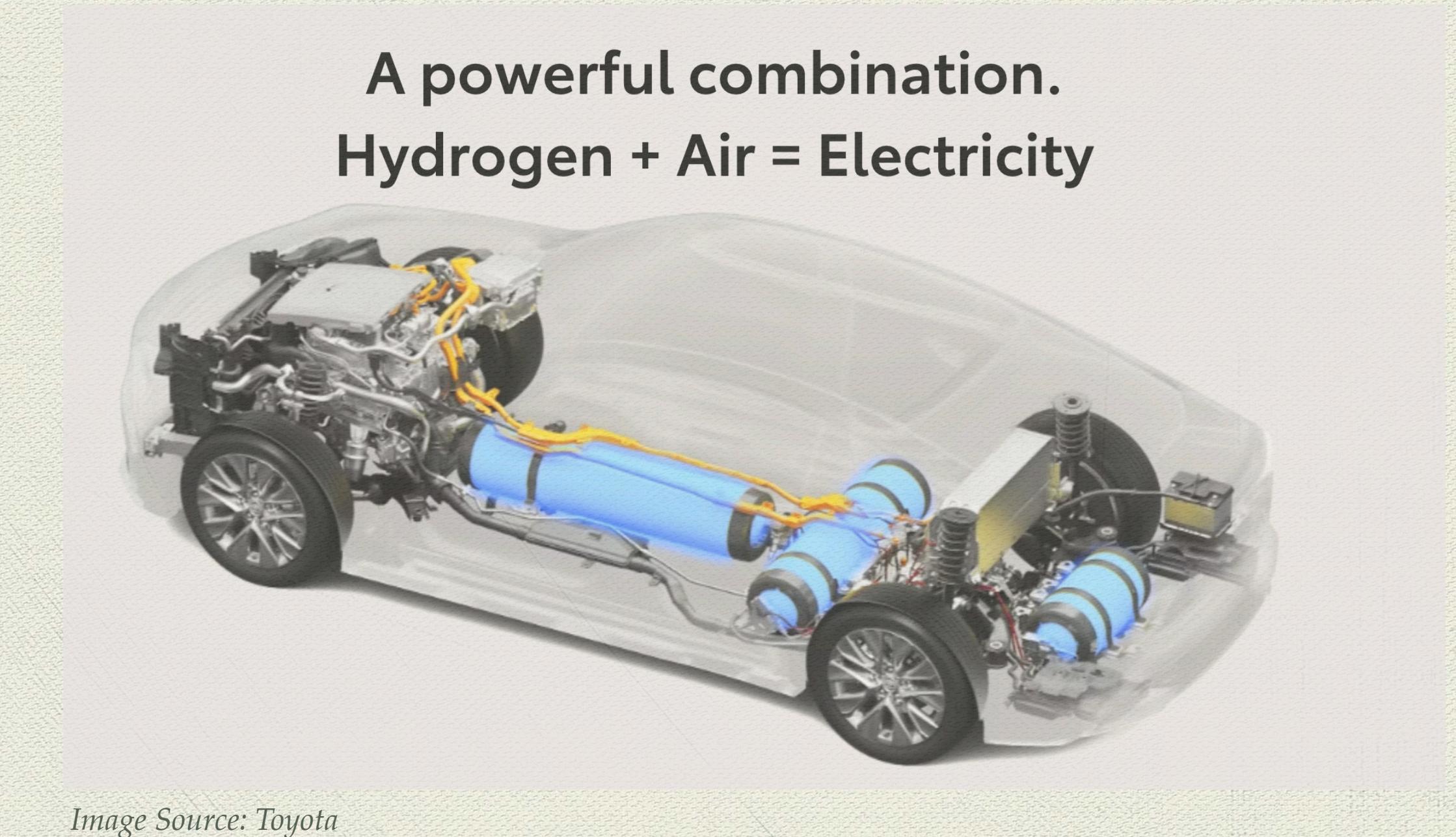


Image Source: Toyota

Automakers

Different Types of Vehicles

	Gasoline Vehicle	Electric Vehicle (EV)	Hybrid Vehicle	Plug-in Hybrid Vehicle	Hydrogen Vehicle
Power Source	Internal Combustion Engines (ICE)	Batteries	ICE + Electric Motor (with no external plug-in)	ICE + Electric Motor (with external plug-in)	Hydrogen Fuel Cells
Refueling Speed	Fast	Slower than gasoline vehicles			Similar as gasoline vehicles
Driving Length	Long	Limited compared to gasoline		Limited electric-only range; Overall similar to gasoline vehicles	Similar as gasoline vehicles
Environmental Impact	High tailpipe emission	Can be considered as clean energy		Low tailpipe emission depend on driving mode; electric-only mode produces zero tailpipe emissions efficient	Can be considered as clean energy
Battery Recycling	N/A	Potential environmental impact of battery disposal		Smaller batteries & less environmental impact of battery disposal compared to EV	Uncertain environmental impact on recycling fuel cell

Government

- The government could consider to take a leadership role in facilitating collaboration between oil companies and automakers to strengthen hydrogen infrastructure development.

- ◆ **Taking the Leadership for Efficient Hydrogen Infrastructure**

- ◆ Hydrogen transition complexities vary across shipping, aviation, and automotive industries, presenting potential higher challenges for the automotive sector based on current available technology:

1. Auto hydrogen infrastructure is more decentralized and intricate compared to aviation (centralized at airports) and shipping (sea-based)
2. The hydrogen infrastructure for autos entails higher risks due to its direct impact on people, occurring with greater frequency, contrasting the less risk-intensive goods transport in shipping.



Image Source: International Air Transport Association (IATA)



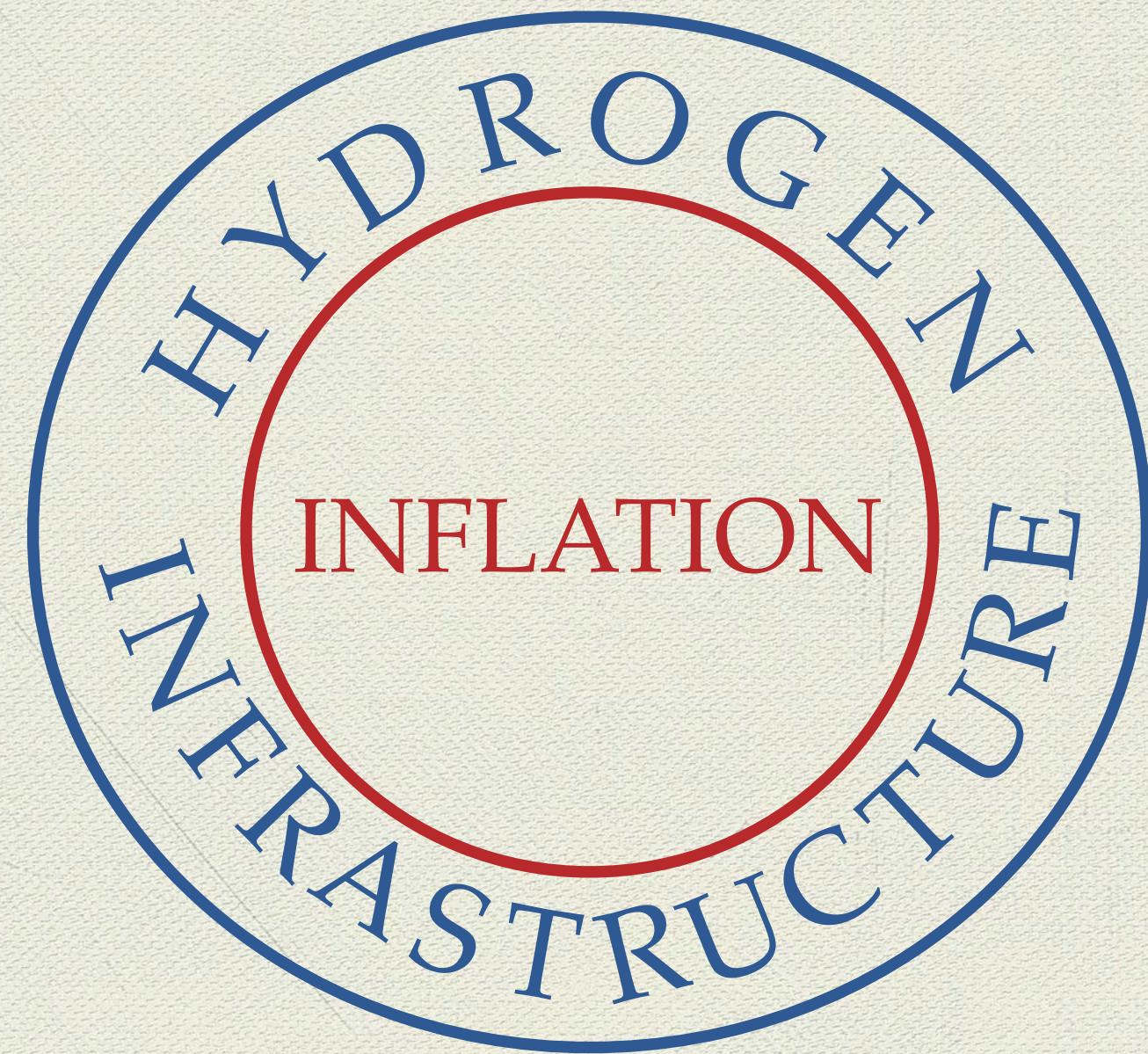
Image Source: Maersk

Government

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- ◆ **Pros of Government Intervention:**

1. Mitigate adverse effects of "unilateral" announcements (E.g., "Zero-emission plans," "EV mandate sales") to ensure a balanced transition, considering both demand and practical supply chain plans for automakers (E.g., providing employees required training skills for a smooth energy transition).
2. Recognize that investing in infrastructure offers protection against inflation, presenting a proactive and practical approach to avoid unnecessary market volatility, rather than planning for an "uncertain" soft landing economy.



Cross-Boarder Organizations



Data Sources & References

- ◆ Data Sources
 - ◆ The Wall Street Journal
- ◆ References
 - ◆ Coe, David T., Elhanan Helpman. 1995. "International R&D Spillovers." European Economic Review, vol. 39, no. 5 (May)