Ford Motor Company

Sustainability Report

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Executive Summary

- Ford is the 10th largest automobile firm with a market cap of $47B
- Ford has a carbon footprint of 2.96 Million Metric Tons
- The firm issued the first sustainability report in 1999
- Ford shifted course and says it is becoming greener and a force for good, but this remains to be seen

On The Road to Better

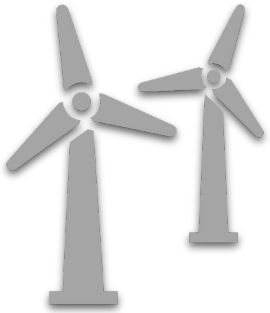
Helping Build a Better World

Company Goals

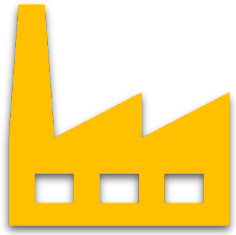
- **Climate Change**: Achieve carbon neutral by 2050
- **Air**: Zero emission from vehicles and facilities
- **Energy**: Use 100% local, renewable electricity in all manufacturing by 2035
- **Waste**: Reach zero waste to landfill, eliminate single-use plastics by 2030
- **Water**: Make zero water withdrawals for manufacturing processes
- **Materials**: Utilize only recycled or renewable content in vehicle plastics

Initiatives

Fumes to Fuel



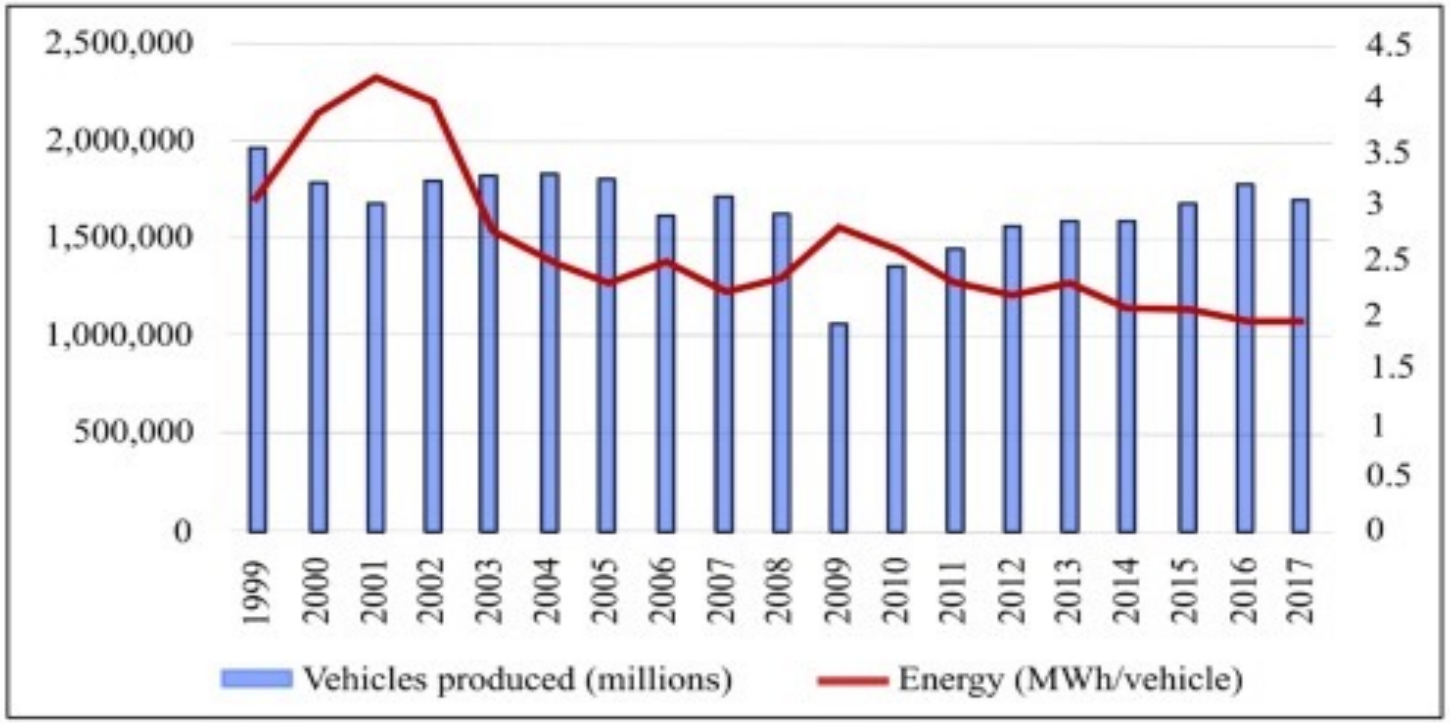
Wind Turbines



Blue Oval City Campus

Vehicle Manufacturing

- Energy usage trends per vehicle from 2000 to 2020
- 50% decrease in total energy
- 55% decrease in CO2 produced
- 57% decrease in water usage



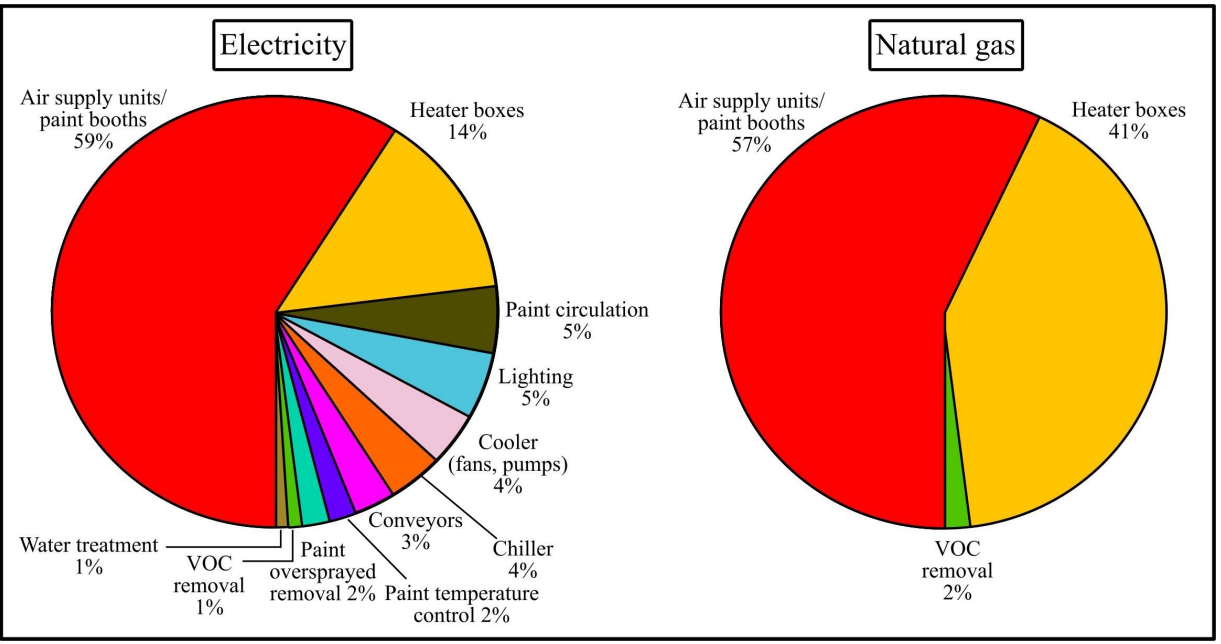
Year	2000	2016	2017
Total vehicles produced (millions)	1.8	1.81	1.75
Total energy used (GWh)	7,013	4,515	4,354
Energy use per vehicle (MWh/unit)	3.9	1.97	1.95
Total water use (m^3)	6,090	5,553	5,112
Water use per vehicle (m^3/unit)	5.3	2.4	2.3
Total $CO_{2,eq}$ produced (tonnes)	2,182,926	1,282,050	1,123,425
$CO_{2,eq}$ per vehicle (tonnes/unit)	1.1	0.55	0.5
Volatile organic compounds (VOCs) emissions (g/m^2)	55.0	32.9	34.6
Total combined waste-to-landfill (tonnes)	80,399	4,092	4,147
Waste-to-landfill per vehicle (kg/unit)	40.3	1.4	1.3
Average new car CO_2 emissions (g/km)	181	120.1	121.0

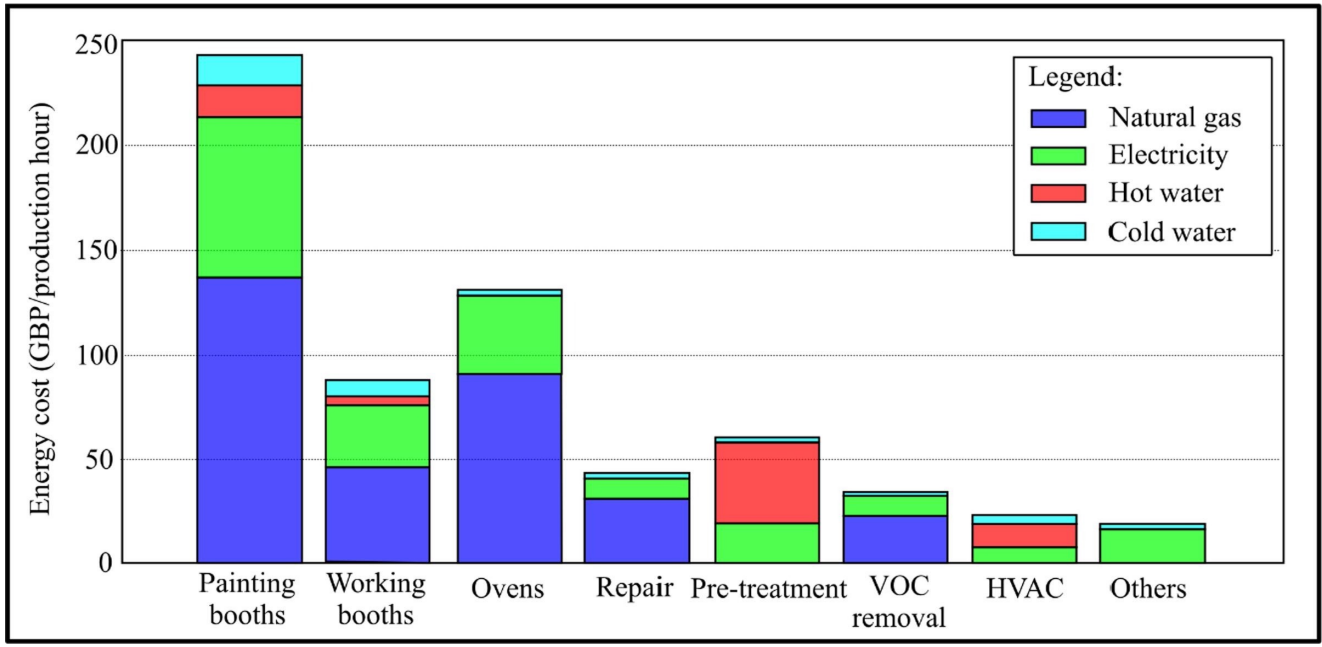
https://www.sciencedirect.com/science/article/pii/S0306261919317611

Initiative 1

"Fumes to Fuel"

- Paint Shop is the largest energy consumer in the automobile manufacturing process
- Convert Volatile Organic Compounds (VOCs) to fuel





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"Fumes to Fuel"

- The process to convert VOCs to energy happens in 3 stages
  - Stage 1: Concentrates the VOCs from the painting process
  - Stage 2: The reformer converts VOCs into a hydrogen rich mixture by breaking up the carbon bonds
  - Stage 3: The hydrogen gas reacts chemically with air to produce electricity and water
- Ford implemented these systems with the added use of natural gas
- Systems produce 5,000-100,000+ watts of electricity

Initiative 2

Wind Turbines

- Initiative
  - Allow Ford's: Dearborn Truck Plant, Michigan Assembly Plant, the Ford Research and Engineering Campus, and Michigan Central Station to function on green energy
- Implementation
  - Ford purchases locally sourced Michigan wind energy through DTE’s MIGreenPower program
  - Ford plans to invest $50 billion with DTE by 2026 to increase solar energy by 70%
- Step towards the 30 percent per vehicle carbon reduction target
- All electricity supply at Michigan plants

  will be clean energy

Initiative 3

BlueOval City Campus

- Implementation:
- Memphis, TN – 3,600 acres
- Manufactures electric vehicles and batteries
  - Ford's Second-Gen EV Truck: *Project T3*
  - Lithium Iron Phosphate Batteries
- Production:
  - 500,000 EV's annually (typical plant 200-330K)
  - "the largest, most advanced, most efficient auto production complex in its 118-year history"
- R&D for biomimicry techniques
  - Studied the gecko's sticky toe pads to improve adhesives, increasing recyclability of auto parts

ROI Analysis – Carbon Emissions

Ford Annual Net Income (in millions)	BLOOMBERG TERMINAL		
Year	**2020**	**2021**	**2022**
Net Income	$1,279	$17,937	($1,981)
Environmental Investment	$50,000		
Climate Change (in millions)	2019	2020	2021
CO2 Scope 1	$ 1,140.00	$ 1,123.25	$ 1,068.40
CO2 Scope 2 Location-Based	$ -	$ 3,110.00	$ 2,600.00
GHG Scope 1	$ 1,451.95	$ 1,124.80	$ 1,069.91
GHG Scope 2 Location-Based	$ 3,195.70	$ 2,715.33	$ 2,616.00
GHG Scope 2 Market-Based	$ 3,068.18	$ 2,447.24	$ 2,000.13
CO2 Gross Costs	$ 3,668.40	Sum of 2021 CO2 Costs	
GHG Gross Costs	$ 5,686.04	Sum of 2021 GHG Costs	
2050 Cost Savings	$6,548.11	70% Reduction in Emissions	
ROI	13.10%		

ROI Analysis - Energy

Ford Annual Net Income (in millions)	BLOOMBERG TERMINAL		
Year	**2020**	**2021**	**2022**
Net Income	$1,279	$17,937	($1,981)
Environmental Investment	$50,000		
Energy (in Millions)	**2019**	**2020**	**2021**
Total Energy Consumption	$ 15,038.90	$ 12,026.40	$ 11,795.90
Renewable Energy Use	$ 1,508.56	$ 1,383.86	$ 1,598.70
Electricity Used	$ 6,456.84	$ 5,346.77	$ 5,149.46
Self Generated Renewable Electricity	$ -	$ 13.49	$ 21.40
Energy Cost	$ 18,544.06		
2035 Cost Savings	$ 10,051.01	80% Renewable Energy	
2035 ROI	20.10%		

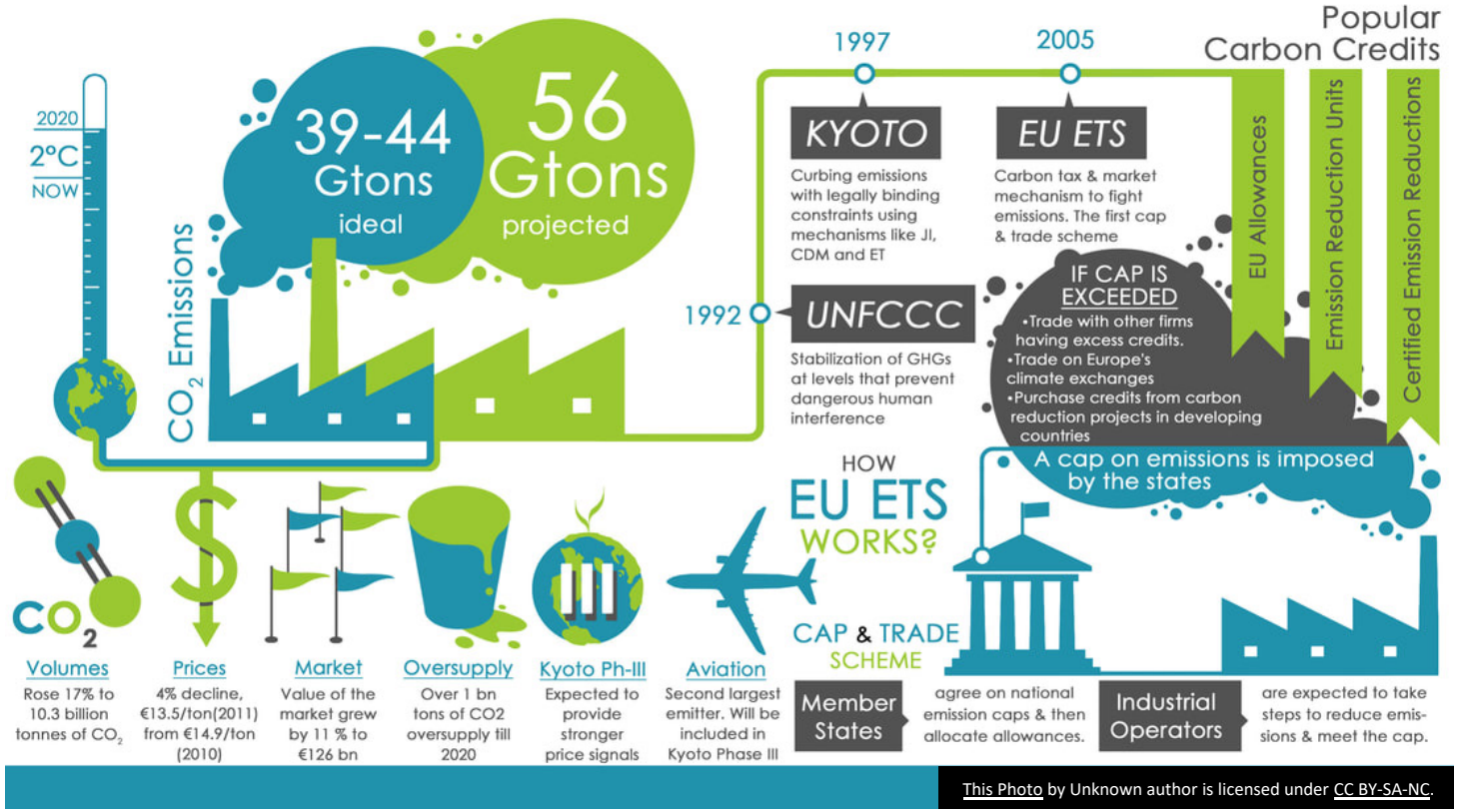
ROI Analysis - Waste

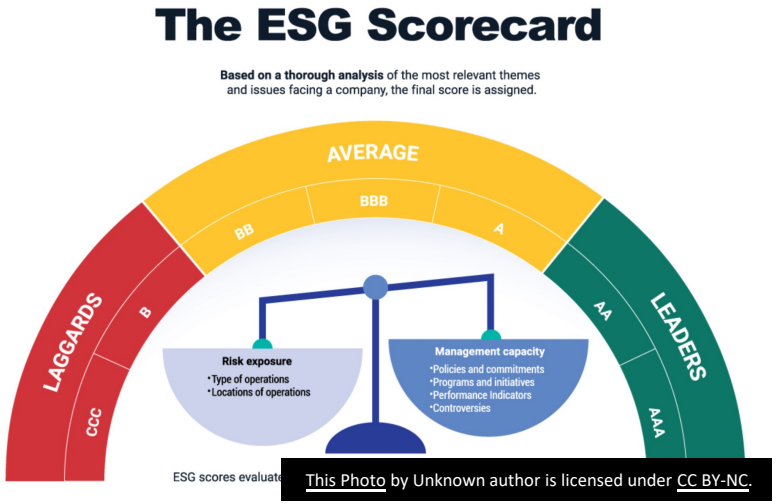
Ford Annual Net Income (in millions)	BLOOMBERG TERMINAL		
Year	**2020**	**2021**	**2022**
Net Income	$1,279	$17,937	($1,981)
Environmental Investment	$50,000		
Waste (in millions)	**2019**	**2020**	**2021**
Hazardous Waste	$ 50.80	$ 39.60	$ 36.80
Total Waste	$ 1,230.50	$ 986.00	$ 861.10
Waste Recycled	$ 1,109.40	$ 893.00	$ 773.00
Waste Sent to Landfills	$ 27.20	$ 17.50	$ 16.30
Waste Cost	$ 861.10		
2030 Waste Savings	$ 851.64	Zero Waste to Landfills	
ROI	1.70%		

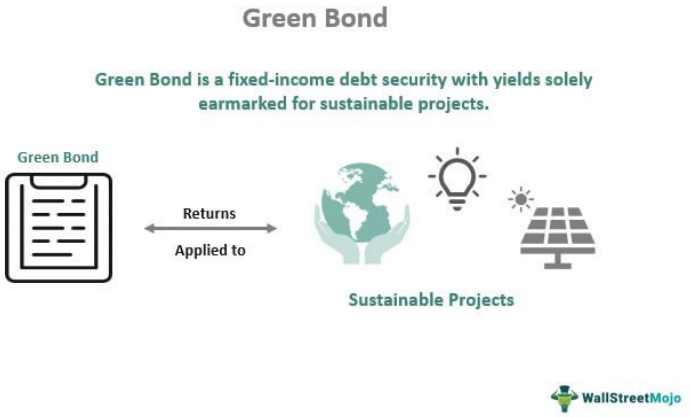
ROI Analysis - Water

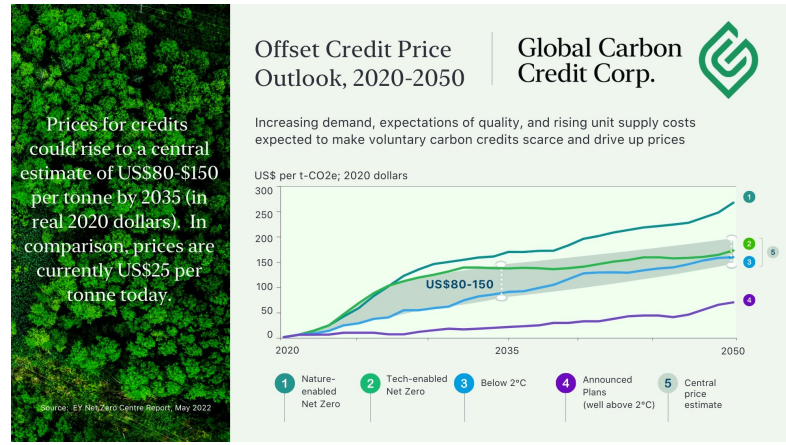
Ford Annual Net Income (in millions)	BLOOMBERG TERMINAL		
Year	**2020**	**2021**	**2022**
Net Income	$1,279	$17,937	($1,981)
Environmental Investment	$50,000		
Water Usage (in millions)	2019	2020	2021
Total Water Withdrawal	$ 19,400.00	$ 15,641.00	$ 14,420.00
Total Water Discharged	$ 9,100.00	$ 6,311.00	$ 7,060.00
Water Costs	$ 21,480.00		
Water Savings	$ 6,444.00	70% Reduction Withdrawals	
ROI	12.89%		

Critique 1: Use of Carbon Credits









What Carbon Credits Do

Critique 1: Use of Carbon Credits

- Ford is offsetting their own carbon emissions while supporting competitors who are investing in green technologies
- This is a short-term solution to the larger problem of reducing greenhouse gas emissions
  - Can continue operations without significant changes to their operations or investing in new technology
- Ford is paying competitors to develop green technologies
  - This boosts the bottom line of their competitors
  - Increases scale of competition for Ford

Critique 2: Environmental Dumping

Ford has a history of toxic dumping

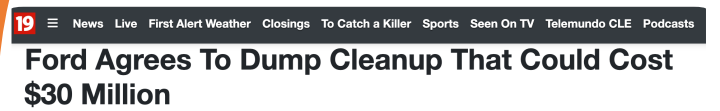
New York orders Ford to clean toxic dump site

- Toxic paint sludge
- Caused rare cancers
- Was the subject of a recent documentary

‘Cancer road’: A Ford factory dumped toxic sludge on tribal land. Years later, it’s still making people sick

A lawsuit filed by New Jersey will attempt to hold Ford accountable for decades of environmental damage to native lands. Richard Hall talks to the residents still fighting for justice.

- Dumped lead, arsenic, benzene, polychlorinated biphenyls (PCBs), semi-volatile organic compounds, chrysene, dioxane, ect
- One street in the area where she lives was dubbed cancer road because nearly every household on it has been touched by the disease



Ford Agrees To Dump Cleanup That Could Cost $30 Million

- Dumped drums filled with solvents, paint, industrial sludge and herbicides
- Leaked and leached into the ground water

Critique 3: Greenwashing

- Greenwashing is when a company misleads, exaggerates, and obfuscates the company's true economic impact
- The mining and wrong disposal of car materials, damage the environment excessively.
- Ford's pledge:

> "The Ford Motor Company does not resist, deny, or ignore change. We pledge to make our most iconic vehicles electric. To use 100% renewable energy across all global manufacturing plants by 2035. To stand for lower greenhouse gas emissions."

Ford's Electric Pickup Is Built From Metal That's Damaging the Amazon

FT The Financial Times • 1 day ago

Ford gambles on $4.5bn Indonesia nickel plant with Chinese partner

US carmaker's teaming up with a Chinese miner comes as the Biden administration tries to build domestic battery industry

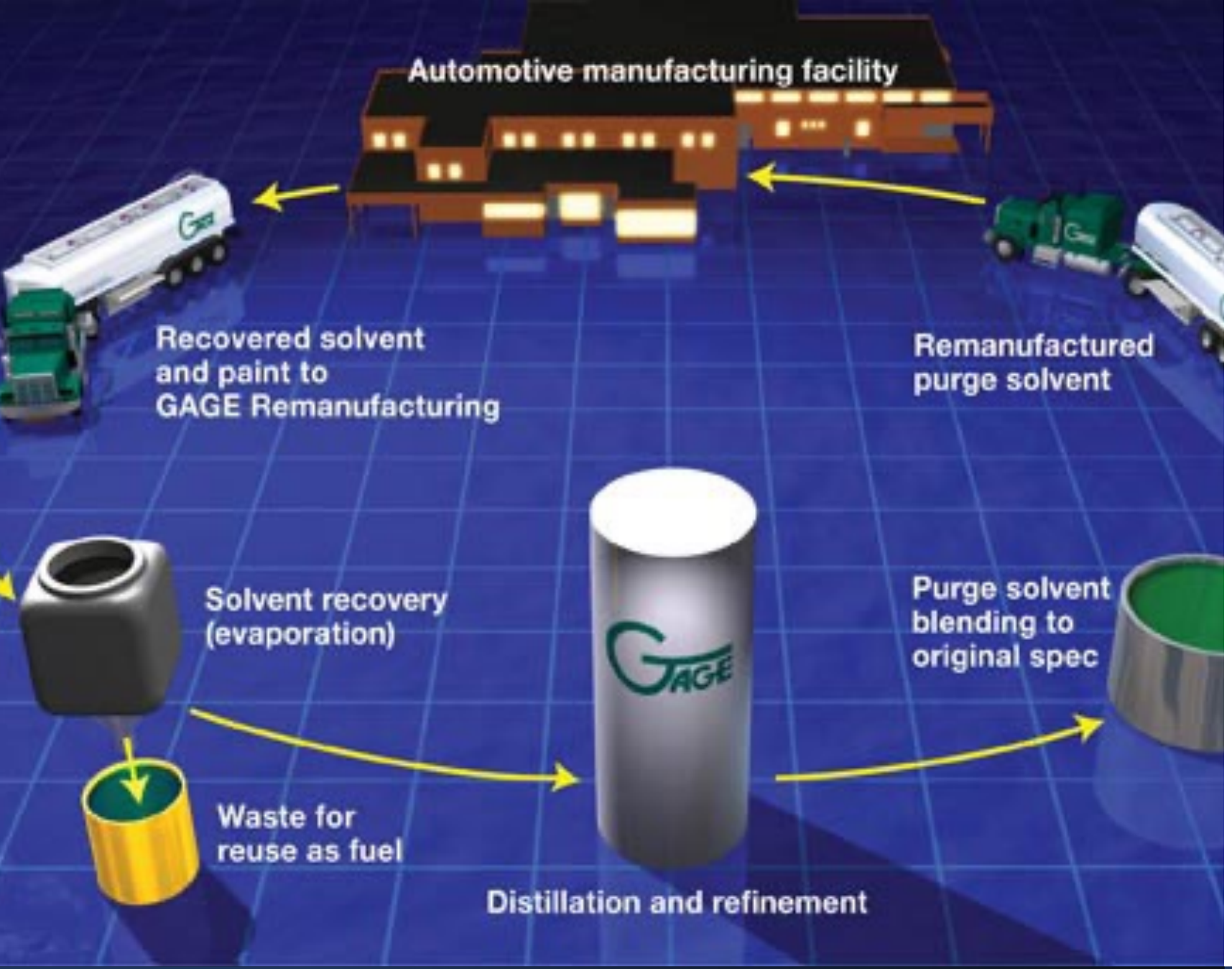
A Bloomberg investigation traced much of the aluminum in the F-150 to a refinery in Brazil accused of sickening thousands of people

Critique 3.1 - Mining

- Bauxite
- Copper
- Lithium

The mining of all these, plus the chemicals that are burned and used, causes the majority of carbon emissions before a car hits the streets.

Ford acquires these materials through million-dollar deals every month for manufacturing.



OUR RECOMMENDATION

Invest in implementing a more closed-loop manufacturing process.

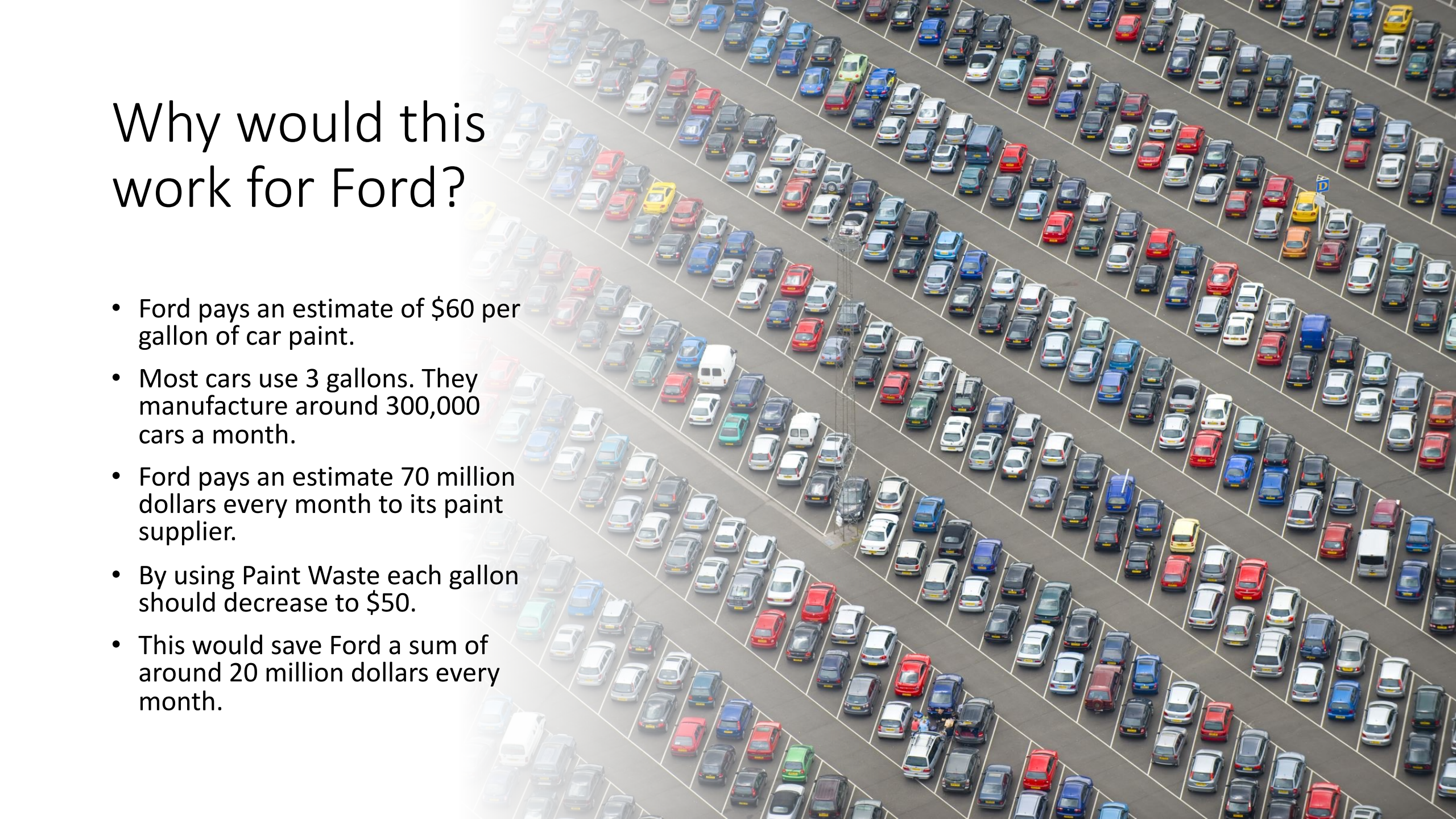
Where to send Ford's paint waste?

- We suggest Ford to get into an arrangement with Sherwin Williams in which they both benefit from.
- Sherwin Williams receives paint waste for free to produce new paint.
- Ford Buys this new line of recycled product at a lower price.
- Ford agrees to marketize this arrangement to assure both companies benefit from a good company image.

SHERWIN WILLIAMS®

Why would this work for Ford?

- Ford pays an estimate of $60 per gallon of car paint.
- Most cars use 3 gallons. They manufacture around 300,000 cars a month.
- Ford pays an estimate 70 million dollars every month to its paint supplier.
- By using Paint Waste each gallon should decrease to $50.
- This would save Ford a sum of around 20 million dollars every month.



Thank you

Any Questions?

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- Jen 134 1 person needs to go at 1:45pm to give slide deck

Ford v Tesla

- Tesla's market cap is 10 times that of Ford's
- Ford's sales are over 4 times Tesla's
- Ford has a better ESG score
- Tesla has significantly lower admissions
- Tesla stock down 50% on the yr and up 50% ydt
- Ford Stock down 25% on the yr and down 1% ydt
- Tesla's combined scope 1 and 2 emissions climbed nearly 4 percent last year
    - Tesla made strides to make each of its electric vehicles less carbon-intensive
    - It’s harder to see what happened with Tesla’s supply chain emissions since it didn’t reveal those numbers until this year
        - It’s hard to manage what you don’t measure

Electric Vehicle Lineup:	Model S, Model 3, Model X, Model Y, Roadster, and Cybertruck	Mustang Mach-E, F-150 Lightning, and E-Transit-350 Cargo