

Driving Growth and Innovation in the Food Industry: Lessons from the Automobile Industry's CAFE Standards

HANK CARDELLO, DIRECTOR, HUDSON INSTITUTE FOOD POLICY CENTER



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Cover: Traffic on an expressway at dusk. (Getty Images)

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INTRODUCTION

Poor dietary patterns are the leading cause of noncommunicable disease in the U.S., and they are creating a significant burden on the economy and on quality of life. Diet-related disease is having a large impact on health outcomes among children and adults, leading to increasing healthcare costs, which has led to a focus on regulatory measures to curb the rising tide. Regulation has largely focused on the U.S. food system, as it provides low-cost, calorie-dense foods, which have been linked to a substantial increase in calories in the food supply and excessive calorie consumption.¹

Substandard eating habits are linked to a number of health conditions, such as diabetes and obesity. Diabetes rates in the U.S. have more than tripled since 1970, and nearly 40 percent of adults are categorized as having obesity. The cost to the healthcare system is significant, and a myriad of health issues are linked to its pervasive spread in the country. Particularly concerning are increasing obesity rates among children, amidst continued public health interventions at the local, state, and national levels.²

Public health officials continue to advocate for additional regulation to shift dietary patterns. Policy efforts have ranged from voluntary commitments by the food industry to government-driven regulations such as taxes on sugar-sweetened beverages and package-labeling provisions. Most of the government regulatory approaches to date have been piecemeal, typically led by local government bodies and focusing on a specific type of food or beverage for taxation, or tending to address a particular component, such as food package labeling. For example, Berkeley, CA passed a sugar-sweetened beverage tax in 2014,³ and the FDA has mandated changes to food labels to increase transparency about calories and added sugars.⁴

This paper seeks to open the discussion on a broader policy approach to reduce excessive consumption of calories, sugars, saturated fats, and sodium, which are linked to conditions

such as diabetes, obesity, cardiovascular disease, and certain cancers. It will do this by exploring Corporate Average Fuel Economy (CAFE) standards, an automobile industry “cap and trade” regulatory model.

The government has used CAFE standards as a rubric to effect reductions in automobile fuel consumption and greenhouse gas (GHG) emissions. Congress first established these standards in 1975 in response to the 1973 Arab oil embargo, and they have evolved to include a variety of measures that ultimately seek to increase the fuel economy of America’s vehicle fleet, cut fuel emissions, and reduce U.S. oil consumption. While many economists and policy advocates agree that increasing fuel economy — how far a person can travel on a gallon of fuel — does not address these issues in totality, there is no question that these regulatory standards have led to a significant industry change.

After a brief examination of current food regulatory policy, this paper will explore the CAFE standards as a federally driven regulatory approach to impact the broader public good. After reviewing the evolution of standards over the past few decades and assessing their impact on public health and business outcomes, we will cite lessons from this model for the food industry and evaluate the potential benefits of the standards. This will include an objective dissection of the pros and cons of the CAFE model and an evaluation of how to apply the lessons learned to the food environment. Specifically, we will examine the impact of CAFE standards on auto industry innovation and competitiveness. The goal of this paper is to spur dialogue and action to create collective impact across multiple food industry sectors so that manufacturers, restaurants, retailers, and others will see the opportunities in improving their product lines and marketing practices.



1. DIET, HEALTH, AND THE CURRENT REGULATORY APPROACH

In our current food system, diet-related noncommunicable diseases contribute to the leading causes of mortality and morbidity, including cardiovascular disease, type 2 diabetes, cancer, and osteoporosis.⁵ These conditions — in conjunction with their risk factors, including obesity — account for significant costs to the U.S. healthcare system. The Centers for Disease Control and Prevention (CDC) estimates that 75 percent of U.S. healthcare dollars are used to treat preventable chronic diseases and conditions. The CDC has determined that heart disease and stroke in the United States cost more than \$300 billion each year, which includes the cost of healthcare services, medications, and lost productivity. Diabetes is estimated to cost \$327 billion annually, including hospital inpatient care, medications, and loss of productivity,⁶ while obesity adds another \$147 billion in costs each year⁷

Obesity is one of the foremost diet-related public health challenges. According to the Harvard T. H. Chan School of Public Health, the health effects are vast, creating lasting impacts on communities, nations, and future generations. The most recent data from the Behavioral Risk Factor Surveillance System (BRFSS) show that adult obesity rates now exceed 35 percent in seven states, 30 percent in twenty-nine states, and 25 percent in forty-eight states.⁸ Though these rates are showing some stabilization, they have increased in numerous states in the past year. Particularly concerning for the

Photo caption: A food label decoder shown on the side of a Classic Coke soda can in the UK. (Education Images/Universal Images Group via Getty Images)

future health of the nation are National Health and Nutrition Examination Survey (NHANES) data showing that the national obesity rate among those aged two to nineteen is nearly 20 percent, with overall childhood obesity rates more than tripling since the 1970s⁹

Beyond the direct costs of medical care and prescriptions related to obesity, there are indirect costs resulting from lost workdays, higher insurance premiums, and lower wages and discrimination. Researchers calculate that the total cost to treat these health conditions related to obesity, plus the indirect costs at work, exceeds \$1.4 trillion annually. To put this in perspective, the Milken Institute estimates that this figure is more than twice what the U.S. spends

on national defense and is equivalent to 8.2 percent of U.S. GDP, exceeding the size of the economies of all but three U.S. states¹⁰

Furthermore, these chronic diseases impose considerable intergenerational costs, including reduced educational attainment and poorer health for those afflicted and their children, potentially creating a downward economic spiral. Research also suggests that these diet-related conditions disproportionately impact low income and ethnic populations. Type 2 diabetes risk varies by race and ethnicity, and the disease is more prevalent in non-Hispanic African Americans than in Hispanic Americans and non-Hispanic whites¹¹

Table 1: Summary of Food-Based Regulatory Policies

REGULATORY CATEGORY	DESCRIPTION
Dietary Guidelines / National Public Nutrition Education	The dietary guidelines provide an authoritative source for federal food and nutrition education programs, including USDA's National School Lunch Program and School Breakfast Program, and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).
Nutrition Labeling on Food Packages	The Nutrition Labeling and Education Act (NLEA), which amended the Federal Food, Drug, and Cosmetic Act (FD&C), requires most foods to bear nutrition labeling. It also mandates that food labels making nutrient content claims and exhibiting certain health messages must comply with specific requirements. Some recent changes to the Nutrition Facts label include the addition of added sugars and bolding of the word "calories" to create more transparency.
Menu Labeling in Restaurants	The Affordable Care Act of 2010 required calorie and nutrition labeling in chain restaurants with more than twenty units, retail establishments, and vending machines. The final rule mandated in 2018 requires establishments to disclose the number of calories contained in standard items on menus and menu boards. For self-service foods and foods on display, calories must be listed in close proximity to the item and associated with the standard menu item.
Food Marketing	Food marketing regulatory policy in the U.S. is managed by the Federal Trade Commission and focuses largely on voluntary industry commitments. In Europe, Sweden, France, and the UK have adopted constraints or bans on junk food advertising aimed at children. In the U.S., the Children's Food and Beverage Advertising Initiative (CFBAI) has taken the lead in fashioning voluntary food company commitments to reform advertising for children.
Taxation- and Subsidy-based Economic Policies	In the past few years taxation has become a popular regulatory policy among local jurisdictions and even countries, like Mexico. Modeling economic policies deployed for tobacco control, several major U.S. cities, such as San Francisco and Philadelphia, have implemented taxes on sugar-sweetened beverages. Notably, several taxation measures have been revoked, such as Denmark's "fat tax" and the sugar-sweetened beverage tax in Cook County, Illinois.
School-based Policies	An important U.S. regulatory focus has been on targeting schools to improve nutritional standards and support healthy lifestyles. The primary policy is the Healthy, Hunger-Free Kids Act, which requires federal nutrition standards for all foods sold in schools, including in vending machines and school stores. The USDA has also taken steps to create new standards for food sold in schools, such as Nutrition Standards for School Meals and Smart Snacks in School.

Because of these staggering health implications for the nation and its future, public health officials and policy advocates have labored over the last decade to pass a number of regulatory measures designed to reverse these trends. These have ranged from school-based programs involving school lunches, community-based programs such as zoning restrictions for fast food outlets, and industry-based policies such as calorie labeling. Table 1 summarizes several key regulatory measures passed in the U.S. and abroad.¹²

Several public health efforts have been successful in improving consumption habits, food product transparency and marketing practices. In 2006, the Alliance for a Healthier Generation negotiated a voluntary agreement with the beverage industry to remove regular soft drinks from schools and provide lower-calorie and smaller-portion options to children during the school day. Within four years, this initiative led to a 90 percent reduction in beverage calories shipped to the nation's schools. Through the Children's Food and Beverage Advertising Initiative (CFBAI), eighteen major consumer packaged goods (CPG) companies and restaurants have voluntarily committed to advertise foods and beverages meeting specific nutrition criteria to children under the age of twelve. And through the efforts of food advocacy Center for Science in the Public Interest (CSPI), calorie counts on chain restaurant menus became mandatory on May 7, 2018.

Nevertheless, measuring ultimate outcomes — for example, actual changes in body mass index — is the long-term objective and determining successes from failures among narrow, targeted interventions is difficult.¹³ For certain policies there may also be unknown consequences which must be considered. For example, the argument for sugary drink taxation largely suggests that, at minimum, the policy will provide needed funds for public health programs and services. However, one major concern is that these policies are regressive. Low income populations are much more likely to purchase sugary snacks, beverages, and unhealthy foods. They are less likely to consume higher-priced “healthier” foods for many reasons, including lack of access and

availability. In addition, the substitution effect (i.e., that consumers may purchase higher calorie items such as juices instead) could actually lead to increased sugar and calorie intake.

As a further example of potential unintended consequences of taxation, we can look to other European countries that have implemented “fat taxes.” Denmark enacted a tax on butter, milk, cheese, pizza, meat, oil, and processed food on products containing more than 2.3 percent saturated fat. The following year it abandoned the effort as the tax led to inflation, cross-border shopping, job losses, and huge administrative costs.¹⁴

Furthermore, as reported by Sisnowski et al. in a systematic review of these regulatory policies, the literature demonstrates that isolated regulatory interventions can improve intermediate outcomes but fail to affect consumption at clinically significant levels. The authors state that the interventions assessed “fail to achieve an effect on consumption that could plausibly be considered as clinically significant, i.e. as having an effect on individuals’ nutritional intake to the extent that it would reduce the incidence of overweight, obesity, and related chronic diseases.” For example, in New York City, the Department of Health estimated that the new calorie posting rule in restaurants would lead to at least 150,000 fewer New Yorkers [becoming] obese, [and] at least 30,000 fewer cases of diabetes over five years. However, with the exception of a single study focused on Starbucks, the New York City-based studies profiled here failed to find statistically and clinically significant calorie reductions.

In summary, while our aim is not to provide commentary or review the success or failure of current regulatory policies in their totality, we wish simply to highlight the fact that regulatory policies have limitations, particularly as their goal is to reverse the tide of negative health trends. Many of these policies may have cumulative behavioral and health effects in the long term; however, the results indicate that a broader approach may be needed that is aimed directly at decreasing body mass index at the population level in order to improve the nation's health.



2. CASE STUDY: THE AUTOMOBILE INDUSTRY AS A MODEL FOR CHANGE

One such model that could be considered is the CAFE standards for the automobile industry. While various global regulatory models exist for controlling pollution or carbon emissions, the CAFE standards are a well-known, well-researched “command and control” model, albeit one that is still being debated.

The rationale for policymakers’ targeting automakers to reduce emissions is simple. Transportation is one of the largest GHG sources in the United States, contributing more than 29 percent of all emissions.¹⁵ Carbon is emitted from burning fuel, so greater fuel efficiency and alternative powertrains (engines, transmissions and driveshafts) are two avenues automakers can directly deploy during design and production to reduce carbon emissions.

The original CAFE standards were developed in 1975, when the U.S. was in the middle of an oil crisis resulting from the Arab oil embargo and curtailing fuel use was paramount. However, when the embargo ended, gas prices dropped, vehicle purchasing patterns changed, and Americans began buying larger cars and more light-duty trucks. With America’s population and job locations becoming decentralized and carpooling decreasing,

Photo caption: Workers assemble cars at the newly renovated Ford’s Assembly Plant in Chicago, June 24, 2019. The plant was revamped to build the Ford Explorer, Police Interceptor Utility and Lincoln Aviator. (Jim Young /AFP/Getty Images)

the average number of miles driven per vehicle increased. Meeting CAFE standards became much more challenging.

Starting in 2005, Washington policymakers ushered in a number of changes. Between 2005 and 2007, the Bush administration raised the truck fuel efficiency standard from 20.7 to 22.2 miles per gallon (mpg). More significantly, in 2007, Congress passed the Energy Independence and Security Act (EISA), which requires that vehicles from model year 2011 and later, sold in the U.S. but manufactured outside the country, must achieve fleet-wide gas mileage targets.

The National Highway Traffic Safety Administration (NHTSA) and Environmental Protection Agency (EPA) issued phase 2 CAFE and GHG emissions standards on October 15, 2012. Auto manufacturers agreed to:

- reduce GHG emissions from new passenger cars and light trucks by about 50 percent by 2025, compared to 2010;
- increase fleet-wide average fuel economy from 35.4 mpg in 2017 to 49.7 mpg in 2025; and
- reduce GHGs to approximately 160 grams per mile by 2025.

To meet the model year 2017–2025 standards, automakers were expected to make several key modifications and innovations, such as developing advanced gasoline engines and transmissions, reducing vehicle weight, lowering tire rolling resistance, improving aerodynamics and diesel engines, making accessories more efficient, and improving air conditioning systems. Increased electrification of auto fleets was also forecast.

On April 2, 2018, the Trump Administration announced its intent to roll back the Obama administration's aggressive targets for higher fuel economy and lower greenhouse gas emissions. The revised CAFE standards were released on August 2, 2019. The proposed new rules freeze fuel economy standards going

forward at 2020 levels (37 mpg), significantly lower than the 2025 Obama target near 50 mpg.

The Trump Administration also stated it will seek to strip California of its special authority to set its own tough GHG and fuel economy levels. California Governor Jerry Brown vowed to fight the new proposal and was joined by four major automakers — Ford, BMW, Honda and Volkswagen. However, in October 2019 companies with the smallest gains in fuel economy — Toyota, Fiat Chrysler and General Motors - sided with the White House.

Cap and Trade in the CAFE Model

Manufacturers choose their product portfolio composition. In the current evolution of the cap and trade program, each year, miles per gallon and emissions standards are assessed for each manufacturer. If a manufacturer is above the minimum fuel economy standard (“overcompliance”), it has a surplus and receives credits for that year. If a manufacturer is below the standard (“undercompliance”), it has a deficit and must buy credits.

In practice, opportunities for improvements in fuel economy vary widely across manufacturers. Some have comparative expertise in producing and marketing fuel-efficient vehicles, whereas others do not and have found it a greater challenge to meet the standards. This is also where trading comes into play. As manufacturers swap credits, “investments are made where there is the biggest bang-for-the-buck, achieving the targeted aggregate level of fuel economy at the lowest total cost.” Regardless of a manufacturer's fleet, everyone has an incentive to improve fuel economy, even those with a more fuel-efficient fleet.¹⁶

Under current CAFE rules, automakers can bank, borrow, trade, and transfer these CAFE and/or GHG emission credits, both within their own fleets and among other manufacturers, to facilitate current compliance. They can also offset current deficits using future credits to come into final compliance. A

CAFE credit is earned for each 0.1 mpg in excess of the fleet's standard mpg. A GHG credit is earned for each megagram (Mg) of CO₂ equivalent saved, relative to the standard.

For example, the GM Sierra Denali is a full-size work truck with an mpg range of 16 in the city and 23 on the highway. The Honda Ridgeline is a mid-size truck with an mpg range of 19 in the city and 26 on the highway. To balance the lower fuel efficiency of the Denali, GM also builds the hybrid Chevrolet Volt, which gets 42 mpg. (The company recently decided to discontinue the hybrid Volt in favor of more advanced all-electric vehicles such as the Chevy Bolt.) If the absolute standard was 20 miles per gallon, drivers would not be able to buy the Denali work truck, which averages 19 mpg. But because the standard is by manufacturer and not model, GM can use the Volt to help balance the Denali.

Divergent Perspectives on the CAFE Standards

According to Paul Portney, president of Resources for the Future, a nonprofit research institution in Washington, DC, "There are pros and cons to tightening fuel economy standards, involving a range of trade-offs."¹⁷

At the root of any regulatory decision is the question of effectiveness. With CAFE standards, there have been particularly decisive disagreements on issues ranging from the fuel economy of the U.S. vehicle fleet to passenger safety and employment considerations in the auto industry. While some of the disagreement is rooted in political ideology surrounding government's role in regulation, a large part of it results from an inability to successfully assess effectiveness, given the complexity of the consumer auto market. As noted by Kenneth A. Small, Professor Emeritus at the University of California-Irvine, Department of Economics:

While research has led to increasingly sophisticated understanding of consumers' demand for vehicles and

of automakers' responses to regulations, it has proved impossible to develop a single framework that fully captures all the relevant aspects such as consumers' perceptions of vehicle attributes, their expectations about fuel prices, manufacturer's decisions about new technologies, consumers' decisions how much to use and when to retire vehicles, and used-vehicle market adjustments.¹⁸

The most comprehensive review on the standards' effectiveness was completed in 2002 by the National Academy of Sciences.¹⁹ The authors concluded that the CAFE program did contribute to increased vehicle fuel economy, resulting in a 14 percent lower rate of consumption than projected. The majority of reviewers also recognized the indirect costs of the program, which resulted from the downweighting and downsizing of vehicles in the 1970s and 1980s, including the possibility that an additional 1,300–2,600 traffic fatalities would occur annually

The authors also acknowledged the unintended consequences of some of the policies, including provisions for creating extra credits for multi-fuel vehicles. They suggested that these credits had a negative effect on fuel economy and GHG emissions, as fuel technology other than gasoline was rarely deployed in this fleet category. Finally, they acknowledged a number of uncertainties regarding the societal costs and benefits of increasing the fuel economy standards. Among these were "the cost of implementing existing technologies or developing new ones; the future price of gasoline; the nature of consumer preferences for vehicle type, performance, and other features; and the potential safety consequences of altered standards."²⁰

Since the committee's mixed assessment over fifteen years ago, standards have evolved and additional analysis and modeling have been completed, but disagreement remains. Advocates for and against the CAFE standards each present cases showing why they should be maintained and expanded, downsized, or

abolished. We will briefly review a representative subset of the “pro and con” debate across stakeholders — from environmentalists to economists to political lobbying groups — to qualify the numerous viewpoints on the consequences of regulatory action or inaction.

The Economists’ View

Most economists believe that fuel efficiency standards are not the most efficient means to reduce gasoline consumption. According to a University of Chicago survey, 93 percent of economists said they would prefer a gasoline tax over fuel economy standards.²¹ Their primary argument is that these standards do not encourage people to drive less — in other words, to change their behavior. To *efficiently* reduce consumption you would need consumers to buy more fuel-efficient cars and *to drive less*.

Furthermore, economic research has highlighted some of the unintended consequences of fuel economy standards, showing that they keep fuel-inefficient vehicles on the road longer.²² While there are numerous political challenges to enacting a gasoline tax, economists posit that it would address the CAFE standards’ shortcomings by influencing both vehicle purchases and driving decisions.

An article describing research by Wharton professor Arthur van Benthem and Mark Jacobsen, professor of economics at the University of California, San Diego, notes that according to van Benthem, “the problem with CAFE standards is that *there is nothing you can do to encourage people to drive less*’ simply by assuring them that they will be getting better gas mileage [italics mine].” The article conveys van Benthem’s view that “in fact, many people may decide to take longer excursions in order to take advantage of the lower per-mile costs. And if a significant number of people do that, the environmental benefits

of imposing those higher mileage standards may wind up being far less significant than environmentalists anticipated.”²³

Conservative Policy Groups

The Heritage Foundation, a well-known conservative think tank, published a report titled *Fuel Economy Standards Are a Costly Mistake*, which concluded that “CAFE standards are costly, inefficient, and ineffective regulations.” It noted that “under the Obama Administration, CAFE standards have become a tool for combatting global warming, at which they are utterly ineffective,” adding that “Americans are paying excessively for regulations that fail any reasonable cost-benefit test.” The report also stated that since Obama-era standards were implemented, average new car prices have risen to \$6,200 above trend. It highlighted that if CAFE were repealed, 2025 car buyers would save \$7,200 per vehicle.

Environmentalist Groups

As gloomily illustrated in “Can the New CAFE Standards Deliver (Promised Benefits)?,” an article published on the Energy Central website, the “failure of the CAFE regulatory strategy could result in alternative solutions similar to those commonly used in the EU: substantially increased motor fuel taxes, increased new vehicle and registration costs, smaller and poorer performing LDV’s [Light-Duty Vehicles], possibly some form of VMT [Vehicle Miles Traveled] taxes, and other operation/usage fees or restrictions.”²⁴ The Union of Concerned Scientists (UCS) has also proclaimed its support for CAFE standards, stating that they “will reduce America’s consumption of oil, save consumers money at the gas pump, and protect public health and the environment by curbing global warming pollution.”²⁵ They will also help spur investments in new automotive technology, creating jobs and helping sustain the recovery of the American auto industry.”



3. ASSESSING THE CAFE STANDARDS

The U.S. auto industry has been notorious for dragging its feet on proactive regulatory change. Industry insiders largely resist changes, citing impacts on employment, job growth in the industry, and overall economic implications from less revenue.

The applications of this mindset are beyond the scope of this paper. However, the historical inaction by U.S. automakers provides a compelling argument for proactive action among food and beverage companies. As succinctly stated by the UCS, “when America’s auto industry sells its motor vehicles,

the world is a test track and a showroom. But when it comes to fuel economy, America’s automakers possess only two gears: reverse and neutral.”²⁶

The following is an assessment of auto industry success in meeting the CAFE standards and the benefits that have accrued:

Photo caption: Traffic moves across the Brooklyn Bridge, August 2, 2018 in New York City. (Drew Angerer/Getty Images)

Energy Consumption

Figure 1 highlights that automakers have been able to achieve the fuel economy goals laid out in the CAFE standards, including the recently tightening criteria — albeit barely.

However, the general consensus is that attempts to reduce the amount of fuel consumed by motor vehicle drivers have not achieved the desired outcomes. As noted earlier, fuel economy standards do not encourage people to drive less and, therefore, do not change consumer behavior. According to a *Wall Street Journal* article, consumers “spend to the size of their billfold.”²⁷ If they gain more miles per gallon, the tendency is to drive more miles.

This phenomenon is echoed in a Niskanen Center article, “The Tough Economics of Fuel Economy Standards,” which notes

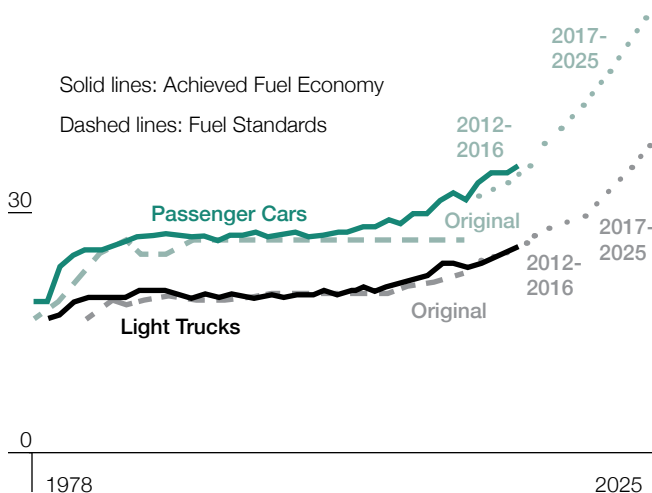
that “once a consumer buys a low-mileage vehicle, the cost of driving an extra mile goes down, thereby reducing the incentive for fuel-saving measures like moving closer to work, working at home, riding the bus to work, or consolidating errands. The tendency of more fuel-efficient vehicles to induce additional driving is known as the *rebound effect* [italics in the original].”²⁸ This also means that as CAFE standards are tightened, the number of miles driven increases.

Federal Reserve data confirm this behavior, showing that between December 1975 and December 2017, Americans more than doubled the number of miles driven annually, from 107.9 billion miles to 266.5 billion.²⁹ Even the improvements in fuel economy from 13.1 mpg in 1975 to 25.2 mpg in 2017 did not offset the sharp increase in miles driven over that period.³⁰ In other words, CAFE standards did not reduce the amount of energy consumed; instead, fuel consumption actually increased by 2.3 billion gallons.

Figure 1. Miles per Gallon Trends and Projections, 1978–2025

In miles per gallon

60



Source: *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends: 1975 through 2017*, Center for Resource Solutions, from Environmental Protection Agency, January 2018.

Greenhouse Gas Emissions

Transportation is one of the largest contributors to manmade GHG emissions in the United States. According to EPA’s “Inventory of U.S. Greenhouse Gas Emissions and Sinks,” in 2015, transportation represented 27 percent of total U.S. GHG emissions (up from 24 percent in 1990). In addition, light-duty vehicles contributed 60 percent of the sector’s total emissions (and thus, passenger cars and light trucks represented one-sixth of all U.S. GHG emissions).³¹

The UCS estimates that U.S. CAFE regulations to date have prevented the production of 268 million tons of carbon dioxide–equivalent global warming emissions.³² Dave Cooke, senior vehicles analyst for the organization, has stated that rolling back the standards, as proposed by the Trump administration, would spew an additional 132 million tons of CO₂–equivalent emissions into the atmosphere in 2030. He believes that CAFE regulations “are what’s driving these improved fuel efficiencies in larger vehicles, and they wouldn’t occur without them.”

From Figure 2 it is clear that CAFE standards have been effective in lowering carbon dioxide emissions.

Innovation: The Secret Sauce

Perhaps the CAFE standards' greatest achievement has been to drive innovation in the auto industry, which did not happily embrace change but grudgingly accepted it in dealing with the increased costs of CAFE-standard compliance. Today's automakers, instead of compromising driver experience³³ as they did in the gas crisis of the 1970s, now build the best cars and trucks ever made, while still increasing fuel economy.

A study at California State University, Long Beach validated that the Porter hypothesis applied to automobile standards. The hypothesis says that well-designed environmental regulations can stimulate innovation, which may lead to efficiency gains or even increased profits in regulated firms.³⁴

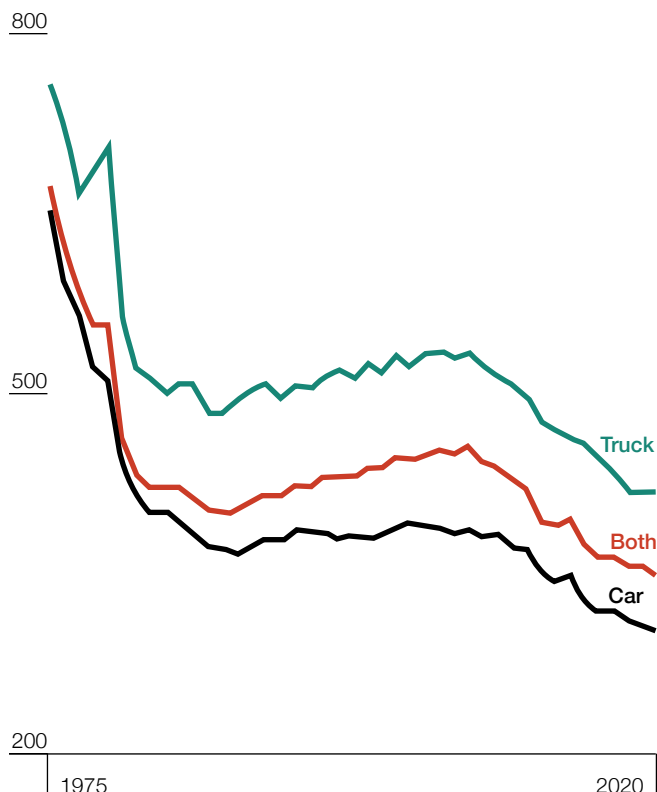
A recent survey done on behalf of a clean transportation industry group found that 95 percent of auto parts suppliers agreed that more ambitious standards encourage innovation and investment in the U.S.

The high level of innovation in the auto industry is further verified in rankings comparing it to other industries. In the American Innovation Index conducted in May 2018, which ranked 163 of America's largest consumer-focused companies across twenty industries and was based on input from over 34,000 customers, the automotive sector scored the highest of all industries surveyed, with two companies in the top ten and all seven in the top thirty.³⁵ For comparison, only two supermarket chains (Aldi and Trader Joe's) and one restaurant chain (Chick-fil-A) scored in the top twenty-five for innovation. (Consumer packaged goods [CPG] companies were not evaluated).

Similar findings were reported in a Boston Consulting Group survey of senior executives in a wide variety of industries worldwide, and in an analysis of select financial metrics.³⁶ Six

Figure 2. Average U.S. Vehicle CO₂ Emissions for Model Years 1975–2017

Adjusted CO₂ (grams/mile)



Note: Adjusted Co₂ values reflect real-world performance and are not comparable to automaker standards compliance levels

Source: *Light-Duty Automotive Technology, Carbon Dioxide Emissions, and Fuel Economy Trends Report*, Environmental Protection Agency, https://19january2017snapshot.epa.gov/fuel-economy/trends-report_.html.

automakers ranked in the top fifty, whereas only two CPG companies, Unilever and Nestlé, made the cut.

A big factor in automaker innovation is research and development (R&D) spending. Statista, a statistics portal,

reports that six major auto companies ranked in the top twenty across multiple industries: Volkswagen, with \$15.8 billion; Toyota, with \$10 billion; Ford, with \$8 billion; GM, with \$7.3 billion; Honda, with \$7.1 billion; and Daimler, with \$7.1 billion. No food companies made it to the top twenty.³⁷

Not only is the amount of auto industry R&D spending impressive; the industry also spends a higher percentage of revenues on R&D than other industries³⁸ The top ten automakers (excluding those in China) spend an average of 4.3 percent of revenues on

R&D, three times the percentage the food industry invests. With the exception of Nestlé, no food company spends as much as \$1 billion on R&D.

This spending has spawned an avalanche of technical innovations.

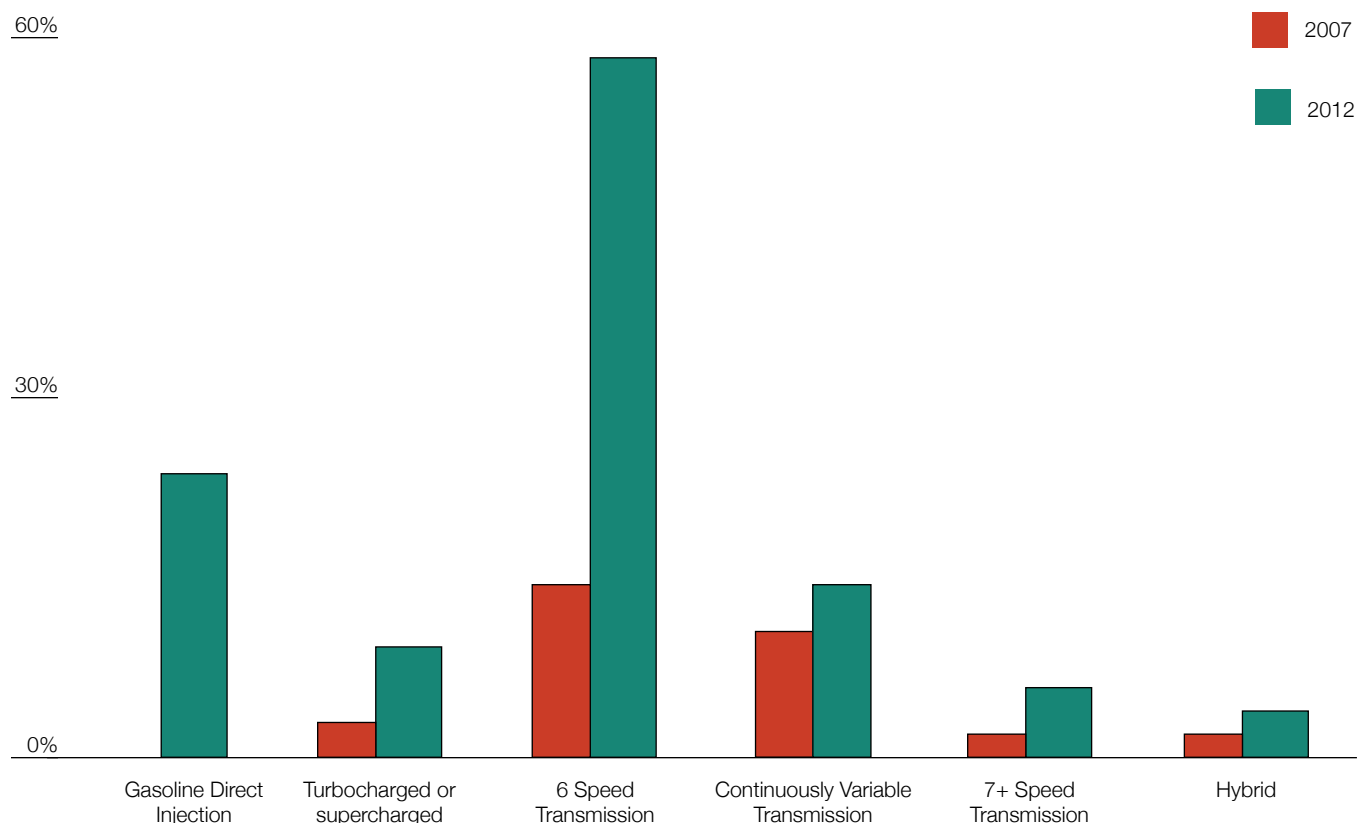
The Rise of New Technologies

The automobile industry has developed and adopted a number of fuel-efficient technologies in response to the CAFE standards:³⁹

Figure 3. Advanced Gasoline Vehicle Technology Penetration

% of Sales

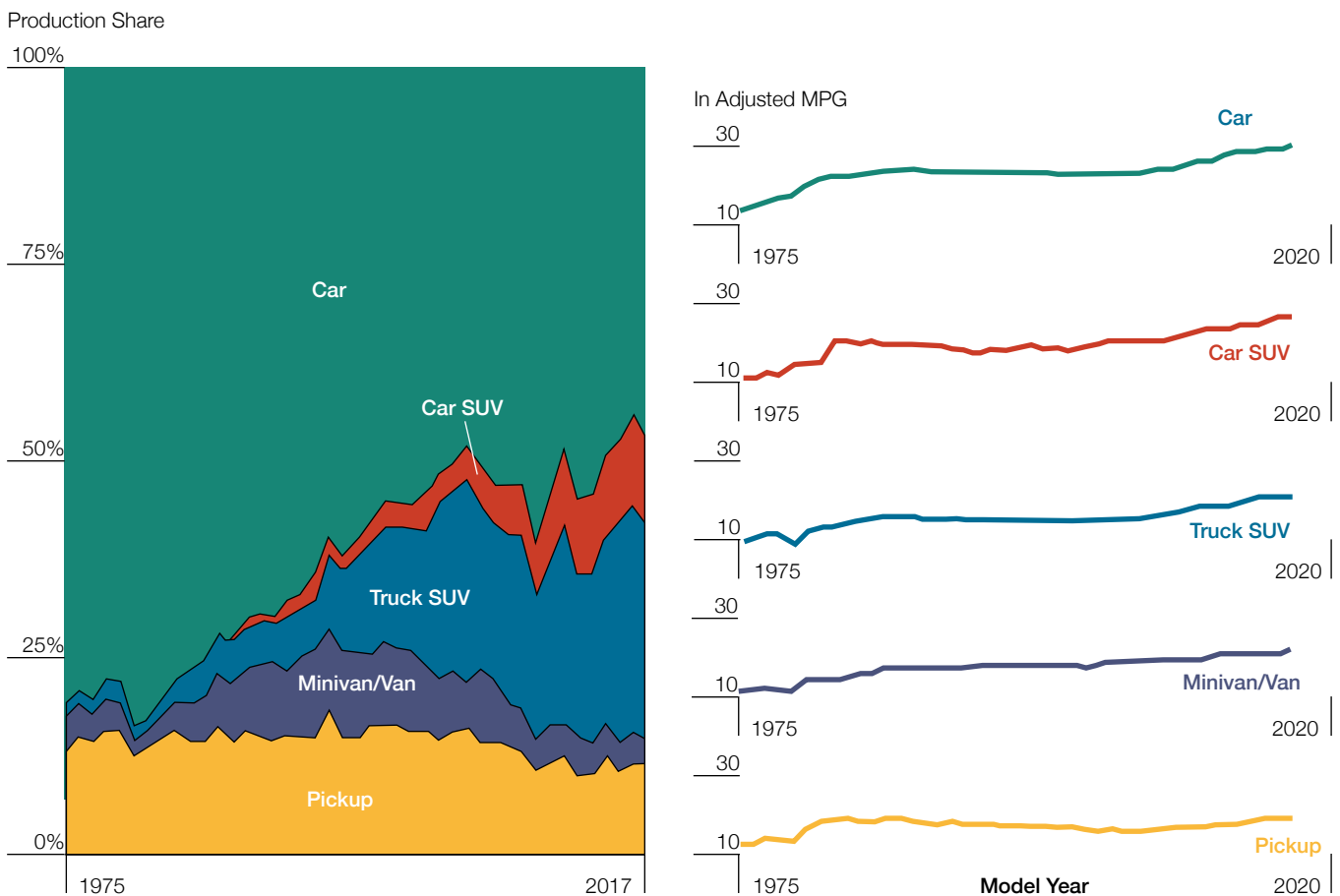
60%



Source: *Technology Innovation: Transforming the Automotive Market*, Environmental Protection Agency, <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100FE5X.PDF?Dockkey=P100FE5X.PDF>.

- gasoline direct injection engines paired with turbocharging, which result in smaller engines that burn less gas while retaining power;
- transmissions with more gears (as many as ten) and continuously variable transmissions, which help vehicles operate more efficiently;
- lighter materials, such as aluminum, high-strength steel, magnesium alloys, plastics and composites, to help cut down on fuel use;
- low rolling resistance tires to reduce friction, which saps mileage efficiency;
- new air conditioning refrigerants to replace greenhouse gas coolants;
- glazed windows to keep out heat; and
- idle stop-start systems that turn the engine off when a vehicle is standing still.

Figure 4. Automobile Production Share and Adjusted Miles Per Gallon, 1975–2020



Source: *Automotive Trends Report*, Environmental Protection Agency, <https://www.epa.gov/automotive-trends/highlights-automotive-trends-report>.

And none of this compromises auto safety. As recent crash test results show, fuel-efficient cars can achieve excellent safety ratings.⁴⁰

Figure 3 shows advances in transmissions that have contributed to automakers' ability to meet CAFE regulations.

Ironically, many of these advances were unused and had been collecting dust on the shelves, but now are being applied to increase miles per gallon and reduce GHG emissions.

Some highlights from recent innovations include:⁴¹

- The newest Tesla Model S P100D electric sedan just became the world's fastest production car, reaching 0–60 mph in just 2.28 seconds. The previous record holder was the \$1.4 million gasoline-powered Ferrari LaFerrari.
- The electric vehicle (EV) segment is growing. True EVs like the Tesla, Chevrolet Bolt, and Toyota Prius Prime saw sales increase 59 percent in 2016, and new alternative power vehicles are popping up in showrooms from virtually every manufacturer in the world.
- BMW now puts at least one turbocharger in every new car it sells in the U.S., with the exception of its all-electric BMW i3.
- Ford is building its best-selling F-series pickup trucks out of aluminum and special military-grade alloys, which make the trucks lighter so they require less gas to move.

The Diversification of Product Portfolios

By adopting innovations, the auto industry has proven that it can sell a wide variety of vehicles and still be in compliance with tightening standards. Automakers in aggregate have met or exceeded the mpg and GHG emissions standards,

even though they have increased the proportion of larger SUVs in their portfolios (Figure 4). This has enabled them to meet consumer demands for a wide range of choices from performance to environmentally friendly vehicles. Without the kinds of innovations cited above, the industry would be unable to meet changing consumer needs while satisfying CAFE regulations.

U.S. Automakers and Global Competitiveness

Perhaps more importantly, it is becoming a consensus opinion that CAFE standards are essential to ensuring the global competitiveness of the U.S. auto industry.

While other countries are passing future bans on internal combustion engines, the U.S. industry has focused on encouraging the American obsession with pickups and SUVs.⁴² It produces quarterly profits, but at the cost of market share: American-produced cars commanded close to 70 percent of the global market in the 1960s; by 2025 that percentage will fall below 15 percent. U.S. carmakers are even abandoning sedans and crossovers in favor of pickups and SUVs, yet American pickups are hardly ever sold outside of North America.

This may be even further exacerbated by the recent Trump administration rollback of the enhanced Obama standards.

Without standards pushing industry to elevate its game, there are many risks to its ability to compete effectively:

- In the 1970s and 1980s, the U.S. auto industry balked at the new EPA standards and promptly lost considerable share to the Japanese, in part because of their vehicles' higher fuel performance.
- Many nations also price carbon, and by next year all of China, the world's top auto market, will be doing so. Reverting to

subpar efficiency would make new American autos less competitive or potentially unlawful abroad.

- With China and the European Union pursuing more stringent standards, U.S. automakers could find themselves at a major competitive disadvantage.⁴³

China, which has a serious air pollution problem, insists that any automaker doing business within its borders sell a significant share of zero- and low-emission vehicles — 10 percent starting in 2019, rising to 12 percent in 2020. Put simply, China has a substantially larger market for autos and, due to its rampant air pollution problems, is pursuing far more stringent fuel efficiency standards. China is already GM's largest market, and last year, the company sold more than 3.8 million vehicles there, compared to 3 million in the United States.⁴⁴

The European Union also will require more stringent standards in 2021 than the 2022–2025 standards currently under threat in the United States. Europe's CO2 tailpipe standards for 2021 are tougher than America's for 2025.

If U.S. automakers fail to innovate to meet the stronger fuel economy standards required in other countries, abandoning the global market to more innovative foreign competitors, they will not lose out only abroad, but may lose out at home too. There is also the risk of falling behind in attracting and

retaining talent. If they depend on incremental, compliance-driven efficiency gains, they will cede the talent race to Tesla, Alphabet, and Apple. Tesla gained over half of GM's market valuation while selling less than 1 percent as many cars, because impressive ambition and talent created unique value.⁴⁵

In addition, efficiency improvements that carry over to electric vehicles (such as lighter construction materials) benefit their competitiveness far more than that of gasoline-powered vehicles. This is because lighter and more aerodynamic electric vehicles require smaller batteries, making the car even more lightweight, efficient, and cost-competitive.

The net impact is that backpedaling on efficiency would undermine Detroit's ability to respond to the threat and opportunity of transformational business models — shared vehicles like Zipcar and Getaround, mobility-as-a-service like Uber and Lyft, and emerging autonomous vehicles. The world market is moving rapidly toward electric vehicles, whose global and U.S. sales are burgeoning. Skating where the puck used to be would squander hard-won advantage and risk market irrelevance.⁴⁶

Weakening U.S. fuel efficiency standards would only undermine the global competitiveness of the U.S. auto industry at a time when the rest of the world is moving in a different direction.



4. THE AUTO INDUSTRY'S LESSONS FOR THE FOOD INDUSTRY

The CAFE standards model, as implemented in the automobile industry, provides an analogue for addressing the primary diet-related disease risks connected to the food environment and the food industry: overconsumption and poor dietary quality. For auto manufacturers, the problem is the use of excess energy (fuel) and the spewing of excess levels of greenhouse gas emissions into the atmosphere. For food manufacturers, the primary issues are also the production of excess energy — in the form of calories — along with the sale of products

of questionable nutritional value (foods high in sugar, saturated fats, and sodium).

Could the automobile CAFE standards provide a model for reducing consumption of excess calories and harmful ingredients

Photo caption: The Oscar Mayer Wienermobile at its 75th Birthday celebration at West 75th Street on July 18, 2011 in New York City. (John Lamparski/WireImage)

and help to reverse rates of obesity, diabetes, cardiovascular disease, and several cancers linked to poor eating habits and overconsumption?

To determine the relevance of CAFE-standard analogies to the food industry, we must first review the similarities and differences between the issues facing each industry.

Reducing Energy Consumption

Like the automotive industry, the food industry has experienced a rapid growth in energy available for consumption. According to the USDA, 3,400 calories per capita were available for consumption in 1975.⁴⁷ That number jumped to 4,000 in 2010, almost an 18 percent increase. But the trend in the food industry is toward smaller — more and more consumers are demanding “smaller portions” — while in the automobile industry, it is toward larger. According to Autodata, in 2017, passenger car sales declined 10.9 percent to 6.33 million, while sales of SUVs, pickups, vans, and crossovers rose 4.3

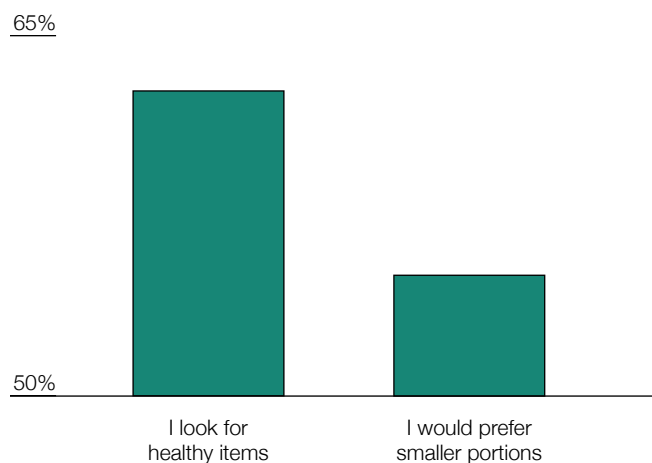
percent, to 10.9 million vehicles.⁴⁸ In other words, a “lower calorie” compact passenger car is becoming less desirable than a “higher calorie” SUV.

As shown in Figure 5, according to a Hudson Institute Food Policy Center study, *Why They Buy: Fighting Obesity Through Marketing Research*, 63 percent of restaurant patrons looked for healthy items on the menu while a majority (55 percent) want smaller portions.⁴⁹

Additionally, the food industry has already stepped up with some initiatives to eliminate calories from the food supply. The Healthy Weight Commitment Foundation, which consisted of sixteen major food and beverage manufacturers accounting for 25 percent of calories consumed in the U.S., had successfully removed 6.4 trillion calories from their products between 2009 and 2012.⁵⁰ This translated to a meaningful daily calorie reduction of seventy-eight calories per person. The three largest soft drink companies — The Coca-Cola Company, PepsiCo and Dr. Pepper Snapple — have pledged to remove an additional 20 percent of their calories sold per capita by 2025.⁵¹ With regular carbonated soft drinks accounting for approximately two-thirds of per capita consumption (an estimated 29 gallons per capita annually) and the “big three” soda companies accounting for approximately 87 percent of carbonated soft drink consumption⁵² a 20 percent reduction could yield a savings of another 3 trillion calories. Lastly, the confections industry’s Always a Treat Initiative, aimed at increasing the number of single-serve items with 200 calories or less by the end of 2021, will also eliminate hundreds of billions of calories.⁵³

On the other hand, the silence has been deafening from other industry sectors, especially restaurants and food service operators, which contribute over 30 percent of all calories.⁵⁴ Only nominal efforts have been made. For example, the National Restaurant Association’s Kids LiveWell program insists on highlighting only two menu items for children per chain that meet certain caloric and nutritional criteria, and this delays further progress. Criteria

Figure 5. Consumer Preferences in Restaurants

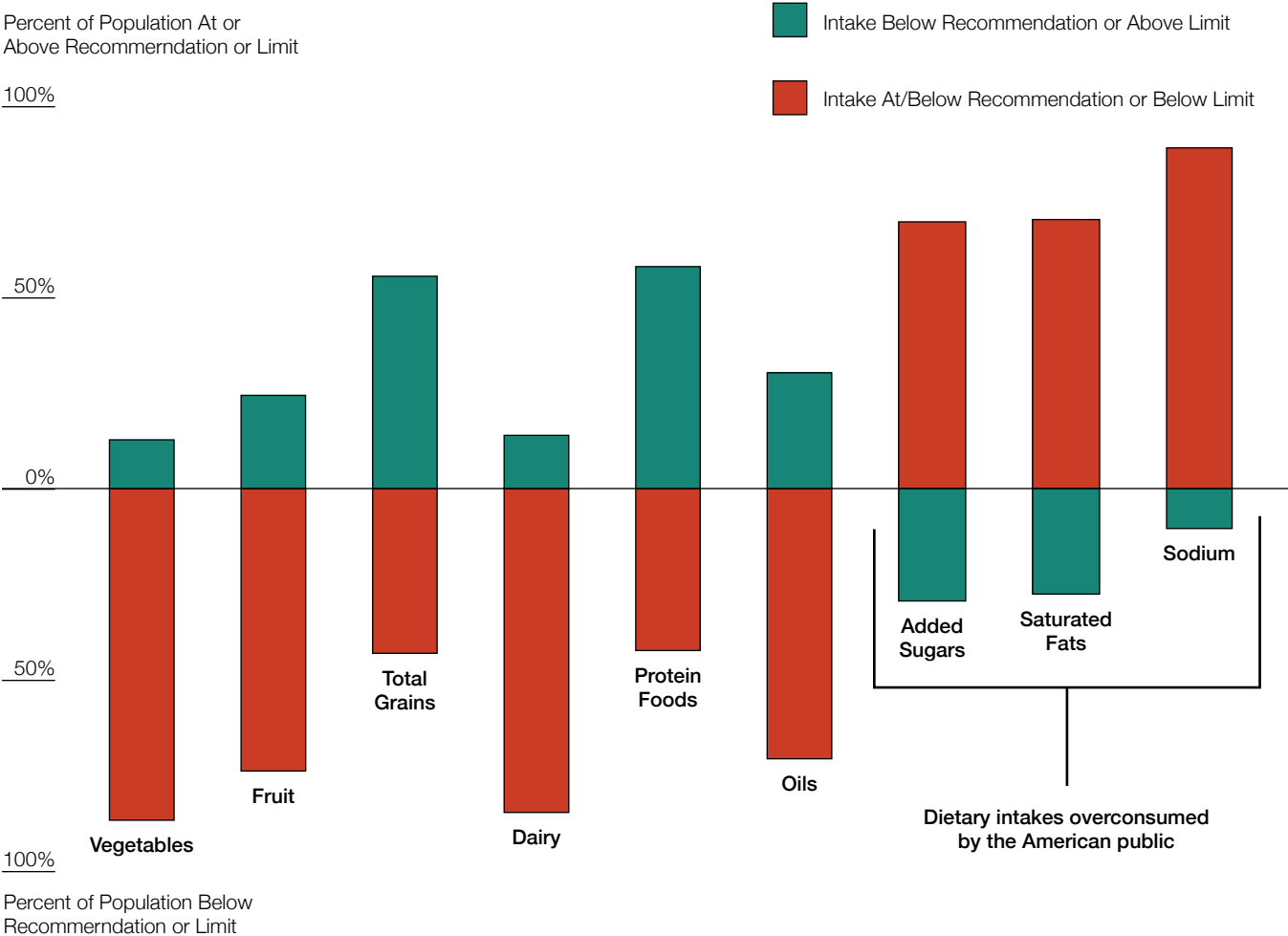


Source: Hank Cardello, *Why They Buy: Fighting Obesity Through Marketing Research*, Hudson Institute, June 2018, <https://s3.amazonaws.com/media.hudson.org/files/publications/CardelloFINAL.pdf>.

should be more stringent for this sector, as a U.S. Department of Agriculture Economic Research Service report found evidence that eating one meal away from home each week, a growing trend, translates to an extra 134 calories per day.⁵⁵ All this suggests that the restaurant and food service sector should step up and make a commitment to lower the calories it sells, or be subject to criteria that require it to make changes.

Another sector linked to excessive consumption by those with obesity is the snacks and sweet baked goods business.⁵⁶ These companies have also contributed little to reducing the number of calories sold. Thus, their commitment hurdle should be higher than the hurdle for those companies that have made a demonstrated pledge to remove calories and improve their product offerings.

Figure 6. Dietary Intakes Compared to the U.S. Dietary Guidelines



Source: "Current Eating Patterns in the United States," *Dietary Guidelines for Americans 2015–2020*, Office of Disease Prevention and Health Promotion, <https://health.gov/dietaryguidelines/2015/guidelines/chapter-2/current-eating-patterns-in-the-united-states/>.

This suggests that food industry self-regulation to reduce calories sold (or government regulations if industry does not step up) are viable approaches, even though attempts to reduce auto energy consumption have been futile. Food industry behavior change is already underway in the face of a serious health crisis, but certain sectors have not contributed to reducing their “calorie footprint.”

Removing Problem Ingredients

The food industry suffers from its own problem ingredients, which mimic the undesired GHG and CO₂ emissions from motor vehicles. The “big three” — sugar, saturated fats, and sodium — have been cited as contributing to a broad array of health maladies, including obesity, stroke, heart disease, hypertension and certain cancers.

As Figure 6 shows, the “big three” offending ingredients are clearly overconsumed by the American public.

On March 4, 2015, the World Health Organization issued new guideline recommendations that adults and children should reduce their daily intake of added sugars to 10% or less of total energy intake.⁵⁷ A further reduction to below 5% or roughly 25 grams (6 teaspoons) per day was noted as providing additional health benefits. The recommendations were based on evidence that shows, first, that adults who consume less sugars have lower body weight and, second, that increasing the amount of sugars in the diet is associated with a weight increase. In addition, research demonstrates that children with the highest intakes of sugar-sweetened drinks are more likely to be overweight or obese than children with a low intake of sugar-sweetened drinks.

Complementing this “war on sugar” are several initiatives globally to tax sugar-sweetened beverages to reduce their consumption. Besides a number of municipalities in the U.S., soda taxes have been implemented in countries such as Mexico, Chile, the UK and Saudi Arabia. In addition, incorporating an “added sugars”

designation on package labeling will also be required in the U.S. by July 1, 2021 while Chile already has instituted its black stop sign labeling to highlight products that are high in calories, sugar, saturated fats and sodium.

While sugar has become the primary target of public health bodies and advocates, concern remains high concerning two additional dietary ingredients: saturated fats and sodium.

According to the American Heart Association (AHA), eating foods that contain saturated fats raises blood levels of LDL cholesterol which increases the risk of heart disease and stroke. Studies of many populations have shown that lower intake of saturated fat coupled with higher intake of polyunsaturated and monounsaturated fat is associated with lower rates of cardiovascular disease. Saturated fats come primarily from animal sources, including meat and dairy products, along with baked goods and fried foods. The AHA recommends aiming for a diet with 5 to 6 percent of calories from saturated fat, or 13 grams per day, but most Americans exceed that level.

Excessive sodium in the diet is also a problem and can lead to high blood pressure, heart disease, and stroke. It can also cause calcium losses, some of which may be pulled from bone. Most of the salt in our diets comes from commercially prepared foods, with breads/rolls, pizza, sandwiches, cold cuts/cured meats and soups heading the list. In the United States, Americans consume high levels of sodium, about 3,400 mg per day on average. However, the Dietary Guidelines for Americans recommends limiting sodium intake to less than 2,300 mg per day — equal to about one teaspoon of salt.

As illustrated in Section 5, the success of the automotive CAFE standards in lowering CO₂ emissions suggests that by taking proactive measures, food companies can reduce problematic ingredients in their product offerings while concurrently enhancing their innovation and competitiveness in the market.



5. OPPORTUNITIES FOR INNOVATION IN THE FOOD INDUSTRY

The real issue facing the food industry is the lack of innovation in changing product portfolios. Obesity has been on the radar screen since the mid-1980s. Hudson Institute studies have shown that selling lower-calorie and healthier items drives growth, and few food industry sectors, unlike the automobile industry, are making the kinds of advances that are truly disruptive.

Beyond actual CAFE-like standards, there is much to be learned from the automobile industry's experience about innovation and its effects on (1) improving product performance and nutrition; (2) expanding product choices; and (3) leveraging these for competitive advantage. A discussion of each factor follows.

Improving Product Performance and Nutrition

Selective actions have been taken by regulators to reduce sugar and calories, make labeling more transparent, and restrict advertising to children. However, no mandatory requirements to reduce calories and unhealthy ingredients — akin to the CAFE

Photo caption: Ethan Brown, CEO of Beyond Meat, talks during the Unlocking the Future of Protein Speaker Series at the Wellness Your Way Festival on August 17, 2019 in Denver, Colorado. (Tom Cooper/Getty Images)

Figure 7: Different Consumer Demands by Health and Wellness Segment



Source: Health & Wellness Segmentation, Natural Marketing Institute, <https://www.nmisolutions.com/syndicated-data/segmentation-algorithms-a-panels/health-and-wellness-segmentation>.

standards — have been imposed on the food industry. With low levels of R&D spending, the industry has not been a big innovator, and these cracks are now being exposed. This is evidenced by sales declines in many traditional processed food categories, calls for more draconian regulations, and the rise of heavily funded startups delivering breakthrough products that are tasty and healthful.

Marketing is important for the U.S. food industry. However, with millennials and Gen Zers demanding more transparency, healthier products, and responsible marketing, there must be a focus on innovation, and food companies must take the leap to the next level. Some have moved more aggressively, such as members of the Sustainable Food Policy Alliance (Nestlé, Mars, Danone, Unilever), but many have not, and R&D levels remain paltry. The food industry must take a hint from automakers that it risks losing loyal customers if it does not serve up healthier, better-tasting items and demonstrate a respect for the environment.

Expanding Product Choices

Despite the shift in auto products to larger SUVs with lower fuel efficiencies and higher emissions, automakers were still able to meet CAFE standards by innovating. Offering consumers a “continuum of choice” remains a viable strategy and is unencumbered by those regulations.

Food companies, to meet the demands of today’s consumers, must contend with demands for organic, gluten-free, non-GMO products on one hand, and soda, chips, and ice cream, on the other. Different consumer segments have different demands. Companies must figure out how to capture new “better-for-you” business while mitigating declining sales of highly profitable, less-healthy icons. This is slowly happening; at the same time, we have witnessed no measurable decrease in the rate of obesity. More must be done.

A segmentation pioneered by Natural Marketing Institute highlights the different needs across consumer cohorts for

healthy, better-for-you and more traditional products. This clarifies that one-size-does-not-fit-all for healthier and lower-calorie products, thus driving food and beverage companies to deliver a “continuum of choice” to meet these varying demands. Figure 7 illustrates the spectrum of attitudes and needs that must be addressed by food companies. This approach mirrors the auto industry practice to sell both SUVs and passenger cars while hitting improved mpg and GHG emissions levels.

A transition to healthier items not only meets the needs of certain key consumer segments, but also helps position companies for growth, as those products are the fastest growing.

Leveraging Innovation for Competitive Advantage

Overlooked is the fact that innovation brings competitive advantage. As seen above, CAFE standards have spurred innovation in the automotive industry. Other familiar names, such as Apple, Amazon, and Whole Foods, started as small businesses with breakthrough ideas. However, large food and beverage companies have been devoid of the innovation gene to date, for several reasons:

I. The current food industry model is the antithesis of innovation.

While Amazon is disrupting online ordering and data capturing aspects of the food industry, products are still pretty much the same, with only minor variations. The core model remains the same: extend existing brands and/or buy up-and-coming companies.

Line extensions: Food companies are still following habits from the 1970s. Before there was Miller Lite, Cinnamon Nut Cheerios, and Diet Coke, companies worried that the “child” would cannibalize sales from the parent brand. No more. This strategy opened the floodgates for new sources of revenue from line extensions of iconic brands, such as Oreos Double Stuf and Rice Krispies Treats. This model is still in force today: simply add a new flavor or

texture to an existing brand and off you go with your next revenue source. Approaching product innovations this way instead of coming up with entirely new items is less of an up-front risk, especially since consumers like the tried-and-true products on which the new items are based. From M&Ms, Lay's, and Oreos to Twinkies and Cheerios, many products on the market have tapped into that strategy. The reality is that almost 90 percent of new food and beverage items fail. But perhaps the bigger risk is that the traditional large food companies protect their iconic brands and lose the war to other innovating companies.

A recent example of this tried-and-true model is Kellogg's January 2019 snack "innovations," which include Pringles Wavy chips, Rice Krispies Treats Snap Crackle Poppers, and Cheez-It Snap'd thin and crispy cheese crackers.

The new varieties of Cheez-It will be more chip-like crackers, Pringles are getting wavy, and Rice Krispies Treats are becoming bite-sized and being coated. These represent no more than new twists on old favorites.

Buy up-and-coming companies: By buying small-to-midsized companies, Big Food fills its innovation pipeline gap by picking up on-trend brands or companies that can then be shoehorned into its marketing and distribution systems to grow those businesses more rapidly. An acquisition is a balance sheet item and does not affect coveted profit and loss statements of operating performance. Some examples include:

- Honest Tea – organic tea drinks (purchased by the Coca-Cola Company)
- Bare Snacks – baked fruit and veggie chips (PepsiCo)
- Kashi – whole grain cereals and snacks (Kellogg's)

II. R&D is MIA.

The food industry spends a pittance on R&D. Not only is its R&D spending rate one-third that of the auto industry; it is also

one-half the rate of another staid packaged goods industry, household and personal products. Bluntly, there are no iPhone-type innovations disrupting the food industry. Where are the twenty-first-century versions of canning, freeze-drying, and vacuum packaging?

Certainly, there are the expected basic innovations to meet rising consumer demand for healthier products, such as Greek yogurt, dairy alternatives like nut milks, plant-based proteins, and "free from" foods and "superfoods."⁵⁸ And industry needs to continue down this path as healthier, lower-calorie foods have been shown to drive strong growth.⁵⁹ However, for the large food companies, these incremental advances are not enough to compete with emerging food firms that are bringing fresh thinking to the industry, nor are they positioning themselves to fully address associated obesity and chronic disease issues.

Nielsen's 2016 *U.S. Breakthrough Innovation Report* states that companies outside the top 100 ranking drove 49 percent of all CPG category growth from 2011 to 2015. According to its authors, "If we fail to remake ourselves in line with emerging consumer tastes, technological realities and business models of the 21st century, we will see growth stall and margins erode, we will lose the battle for world-class talent, and our innovation capability, already fragile, will collapse."⁶⁰ Many big packaged goods companies have been caught off guard, with sales stagnating and market share slipping away to emerging good-for-you and eco-friendly brands and entrepreneurial startups. According to a study, "Is Big Food in Trouble?"⁶¹ written by management consultancy A. T. Kearney and the Hartman Group research firm, the top twenty-five food manufacturers' share of U.S. food and beverage retail sales declined from 66 percent in 2012 to 63 percent in 2015.

The biggest innovations in healthier food products are coming from earlier-stage companies. The plant-based "meatless meats" space includes some instructive examples of how smaller firms are not only innovating on the product side, but

also capturing the hearts and minds of their millennial audience, which desires social change. Here are some examples:

Impossible Foods,⁶² home of the Impossible Burger, which makes vegetarian burger patties that taste and “bleed” like beef. The company’s mission is to save animals, and earth, thus marrying a business objective with a societal need. Impossible burgers are now expanding even into the more traditional fast food chains, including Burger King, which introduced its Impossible Whopper in April 2019.

Gardein,⁶³ whose stated mission is to make the world a healthier, more sustainable place via plant-based, meatless foods. The company has been a big proponent of Meatless Mondays to “improve the health of your body and the environment.”

Beyond Meat,⁶⁴ whose mission is to remove animals from the protein production chain and simultaneously address four major problems linked to livestock: improving human health, positively impacting climate change, addressing global resource constraints, and improving animal welfare. In May 2019, Beyond Meat launched one of the most successful public stock offerings, further emphasizing the tremendous potential for “alternative” meats.

III. Big Food needs to revamp its R&D playbook.

For the food industry to avoid going the way of the dinosaur, companies will have to step up and recognize — as auto companies have under CAFE — that simply relying on marketing

to sell “new and improved” products is a losing hand. Increasing R&D spending on new technologies to improve mpg and reduce GHGs not only helped those auto companies adhere to the CAFE standards, but also positioned them for future growth and competitiveness in the global market.

The key lesson from the auto industry is that, without innovation, companies do not stand a chance. This is especially true for food companies now that awareness of the link between food, consumer health, and the planet’s sustainability has increased to a critical mass level.

What is needed is a leap in R&D spending to truly allow food companies to deliver the next generation of products for consumers who are demanding healthier options. They need to be aiming for the next “freeze-drying” breakthrough by making investments in several compelling areas of the future. An example is 3D food printing — akin to the Star Trek replicator — which produces foods on the spot that meet personalized nutrition needs and tastes and reduces food waste.⁶⁵

The food industry must step up and innovate, as the automobile industry has under CAFE, in a way that delivers its version of high performance/lighter-weight materials, low-resistance tires, electric-powered vehicles, and smaller environmental footprints. The next generation food “car” requires technical advances to perform better and be healthier, as “healthy” is now the new minimum ante for food products, along with good taste.

CONCLUSION

A recent report on healthy diets and sustainable food systems, issued by the Lancet Commissions, has singled out the food industry as contributing to high rates of obesity and undernutrition, as well as having a negative impact on climate change. Among the key messages highlighted in the report are: “global food production is the largest pressure caused by humans on Earth”; “current dietary trends will exacerbate risks to people and planet”; and “substantial dietary shifts need to occur by 2050, including greater than 50% reduction in consumption of unhealthy foods such as red meat and sugar, and a greater than 100% increase in the consumption of healthy foods such as nuts, fruits, vegetables and legumes.” The bottom line is that “industry must ensure shifts to healthy dietary patterns, create large reductions in food waste, and institute major improvements in food production practices.”⁶⁶

Among the actions suggested by the report are a tax on undesirable products; subsidies; and restrictions on the

advertising and marketing of products that the Commissions deem unhealthy.

As this dovetails with rising consumer sentiment that industry must sell healthier products, follow responsible marketing practices, and take stewardship of the environment, food companies will certainly be pressured to take on an even greater role in improving their products and practices. Rather than resist the changes noted here and risk harsh regulatory treatment, industry needs to step up by taking ownership of the societal problems to which it contributes and proactively working to solve them.

Food companies are confronted not with a draconian situation, but with a tremendous opportunity — an opportunity to grow their businesses and be more competitive by changing their entire way of manufacturing and delivering their products to market. If they do not take on this responsibility, they can expect regulators to impose CAFE-like standards on them. They now have a choice. Which road will they take?

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