GREAT DESIGNS IN STEEL

TWENTY YEARS

A PRIMER ON SUSTAINABILITY & THE ROLE OF STEEL

Brandie M. Sebastian

American Iron and Steel Institute

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AUTOMOTIVE COMPANIES ARE SETTING GHG TARGETS

AUTOMOBILES

Honda sets net-zero CO2 target by 2050 for whole supply chain

Automaker asks main suppliers to cut carbon emissions 4% annually

Nissan brings its innovation and excitement to the 'Race to Zero'

March 31, 2021 10:19 AM

Ford adds short-term emissions targets en route to 2050 carbon neutrality goal

The automaker detailed the goals in its annual sustainability report

MICHAEL MARTINEZ

CLIMATE CHANGE

Toyota speeds up carbon-zero target for factories to 2035

Goal pushed forward 15 years as industry prioritizes decarbonization

EDITORS' PICK | Jan 28, 2021, 11:00am EST | 5,677 views

GM To Make Only Electric Vehicles By 2035, Be Carbon Neutral By 2040

Sam Abuelsamid Senior Contributor ⓘ

Transportation

A lifetime in the car business, first engineering, now communicating

Follow

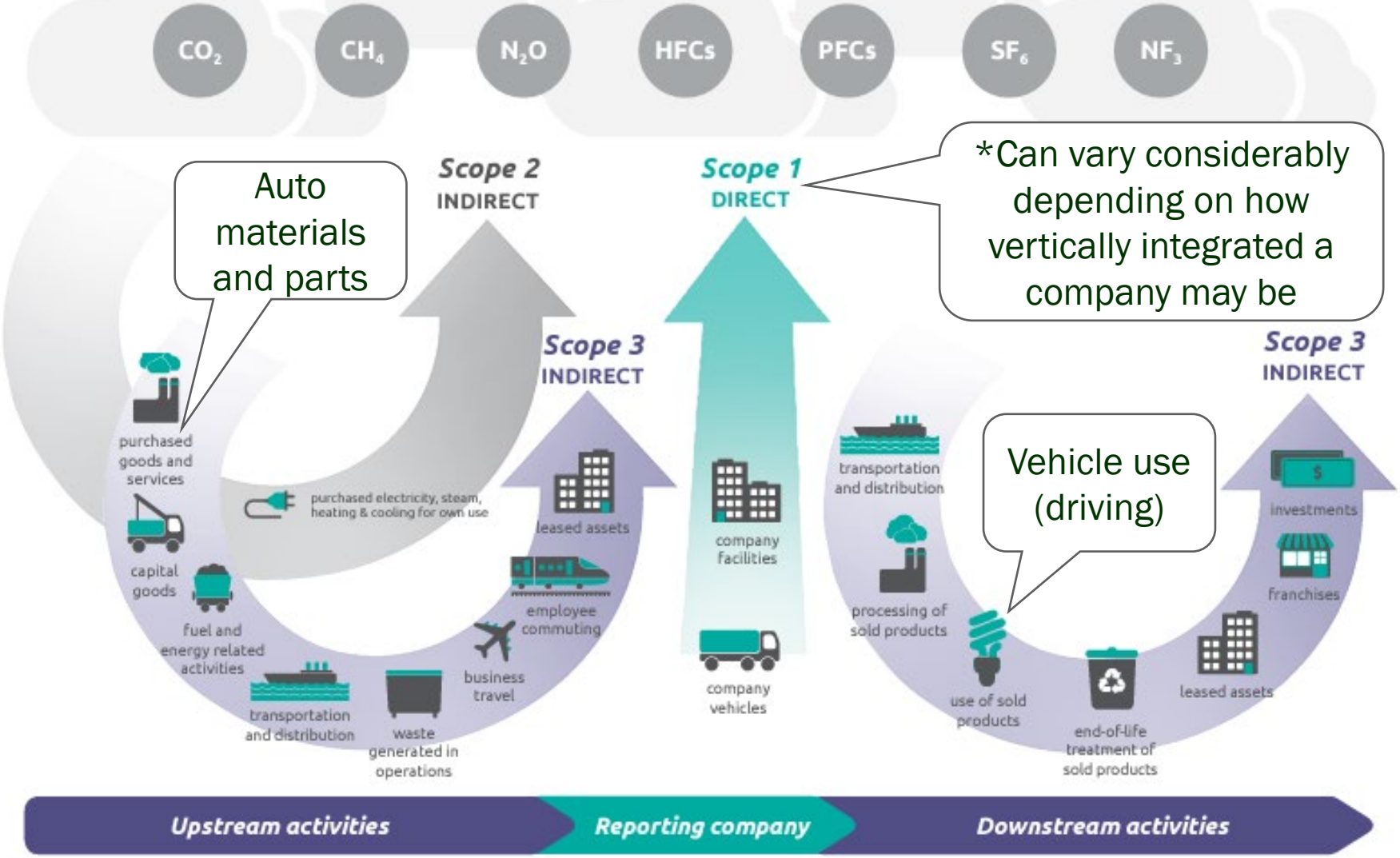
SHIFTING FOCUS TO THE SUPPLY CHAIN

- Companies increasingly recognizing the need to assess and reduce the impacts of their supply chains (Scope 3) to meet their sustainability goals
- Automotive supply chain impacts are driven by the production of battery, structure, and closure materials, including steel, aluminum, and plastics

"We will lead in achieving carbon neutrality because it's the right thing for customers, the planet and Ford. Ninety-five percent of our carbon emissions today come from our vehicles, operations and suppliers, and we're tackling all three of those sources with urgency and optimism."

GM has worked with some of its largest suppliers to create a sustainability council to share best practices, learn from each other and create new standards for the industry. In addition to the council's work, GM is collaborating with suppliers to set ambitious targets for the supply chain to reduce emissions, increase transparency and source more sustainable materials.

WHAT ARE SCOPE 1, 2, & 3 EMISSIONS ANYWAY?



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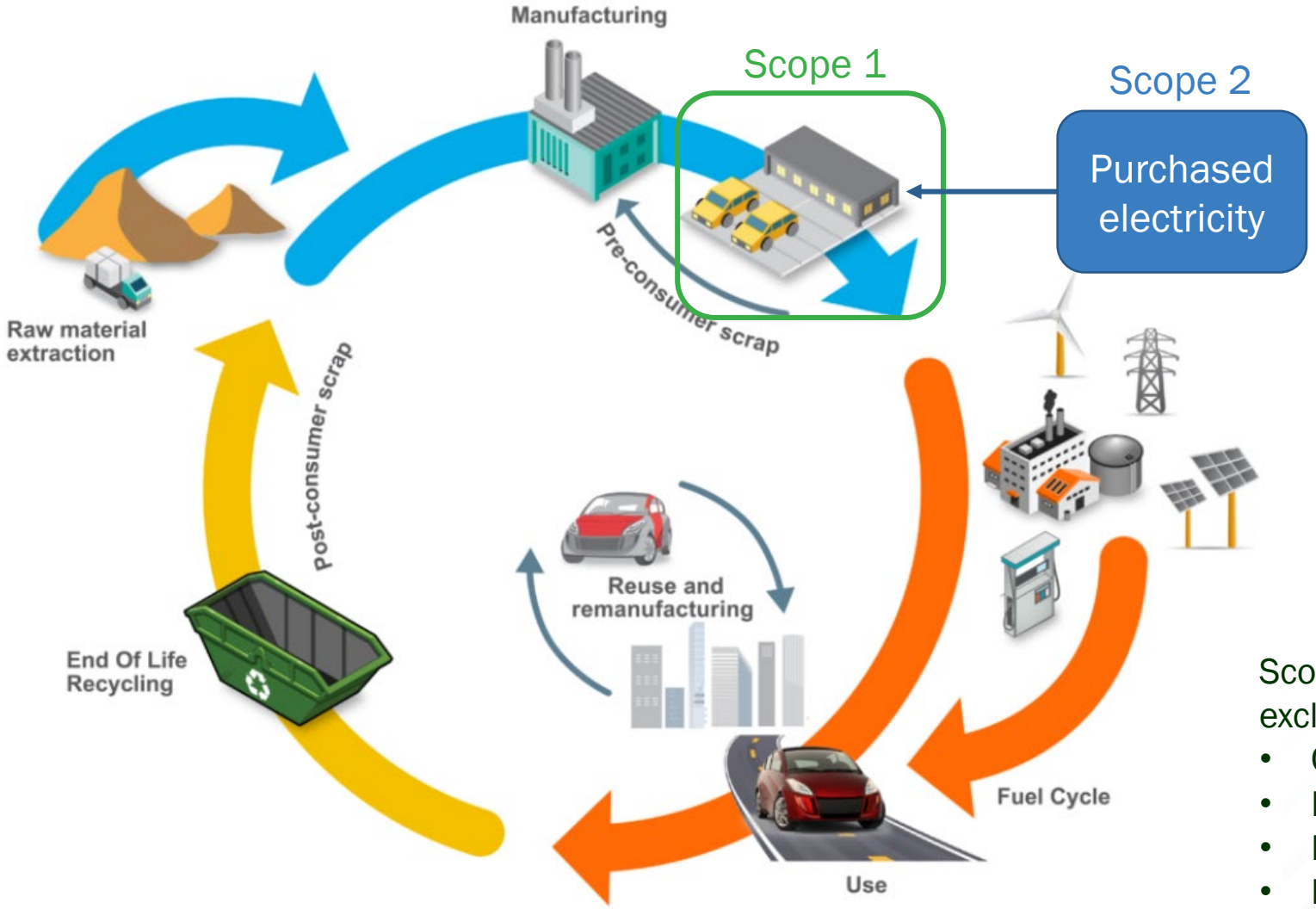
https://ghgprotocol.org/scope-3-technical-calculation-guidance

HOW DOES THIS RELATE TO LCA?

Scope 3
=
Everything
else

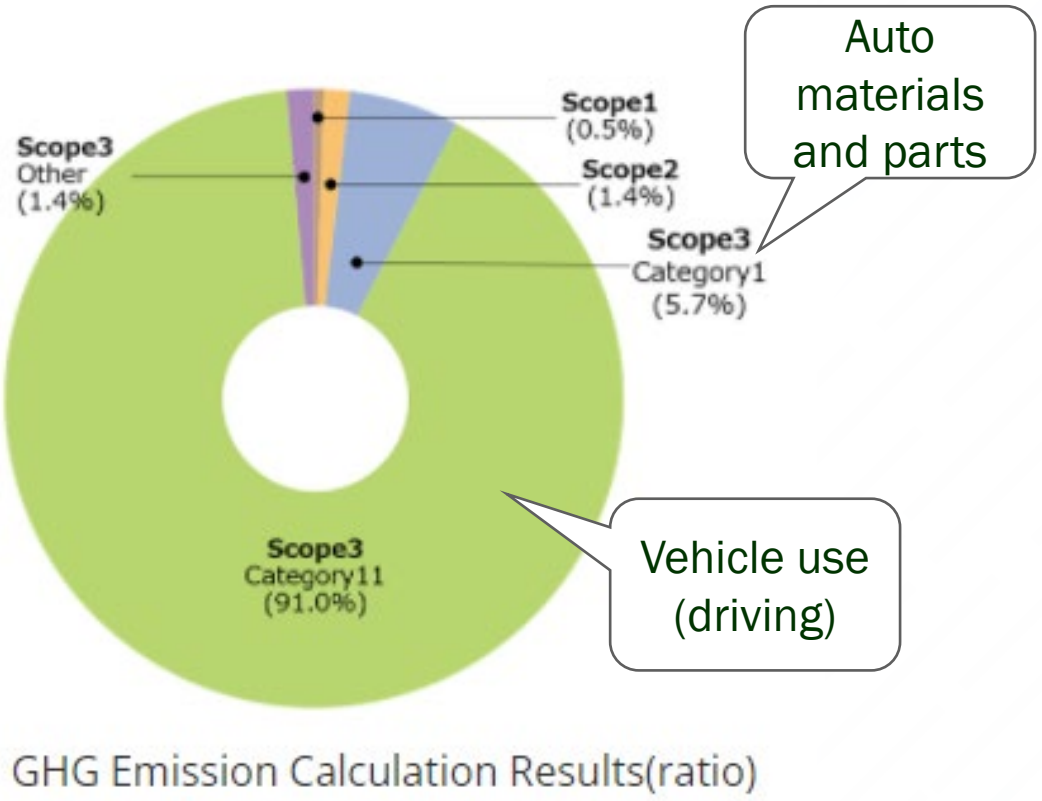


Scope 3 categories typically excluded from LCAs:

- Capital goods
- Employee commuting
- Business travel
- Leased assets
- Investments

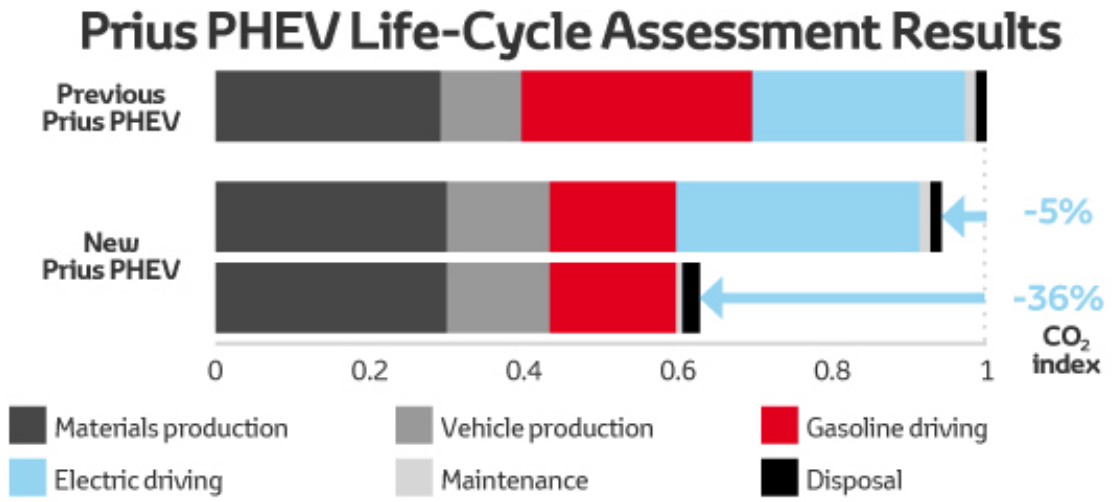
LIFE CYCLE GREENHOUSE GAS EMISSIONS

Company View (Toyota Example):



GHG Emission Calculation Results(ratio)

Product (Vehicle) View:



CO2 emissions from the new Prius plug-in hybrid electric vehicle were 5% lower than the previous model; CO2 emissions can be further reduced by 31% by using renewable energy

https://www.toyota-industries.com/csr/environment/process/scope3/
https://www.toyota-europe.com/world-of-toyota/feel/environment/environmental-challenge-2050/challenge-2

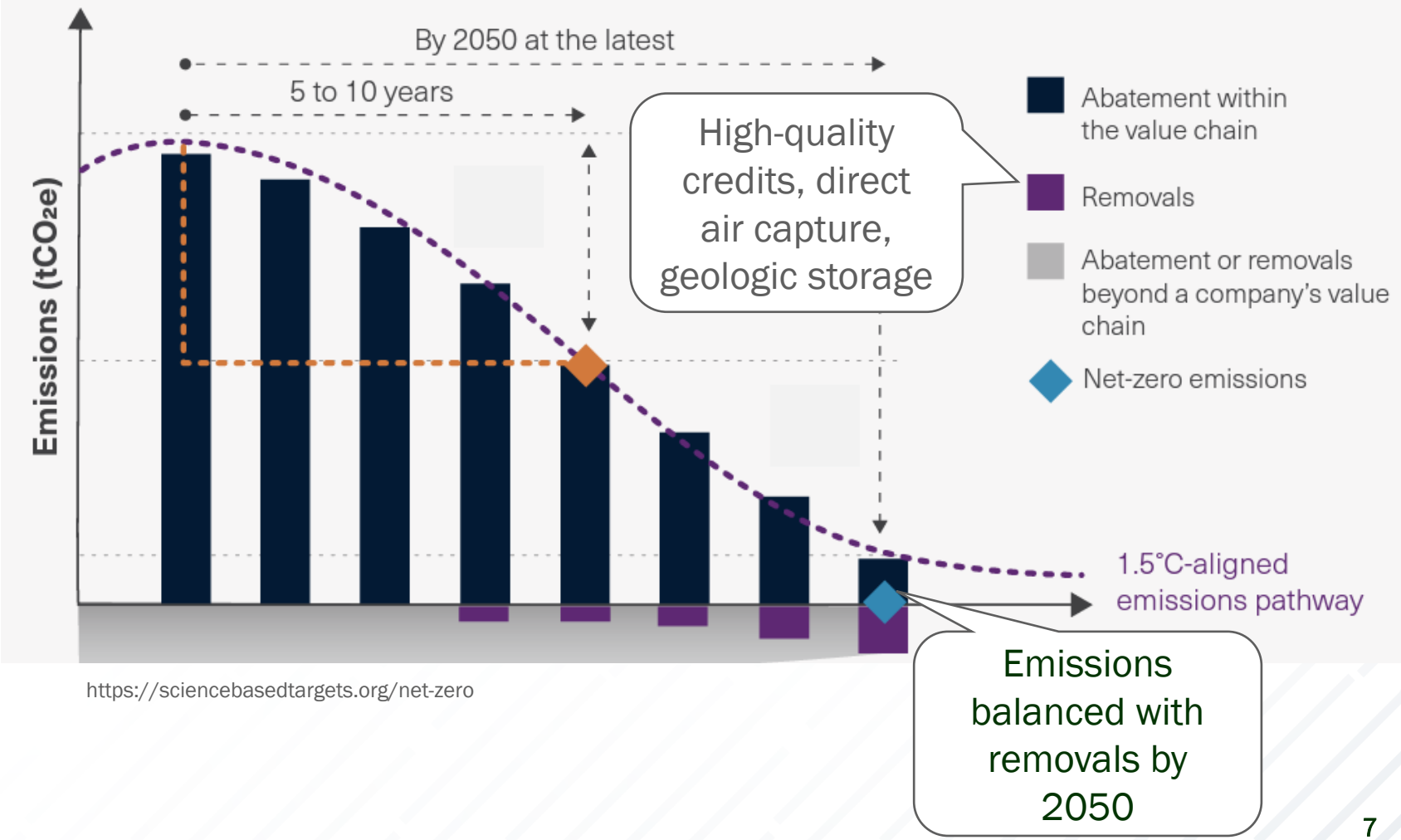
KEY TERMS

Carbon footprint:
Quantity of greenhouse gases released to the atmosphere over the life cycle of a product, system, or service

Carbon neutral:
State in which carbon emissions (CO_2) are balanced by removals from the atmosphere

Net Zero:
Same as carbon neutral, but for all greenhouse gases

Science-based Targets Initiative Net Zero Standard



https://sciencebasedtargets.org/net-zero

OVERVIEW: AMERICAN STEEL INDUSTRY

- Cleanest and most energy efficient of the major steel industries in the world
- Essential to the U.S. decarbonization strategy, national and economic security, and critical infrastructure
- Supports nearly two million American jobs

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U.S. GHG EMISSIONS & THE ROLE OF STEEL

- Globally, the steel industry contributes 7-8% of total GHG emissions
- In the U.S., the steel industry emits 1-2% of total U.S. GHG emissions

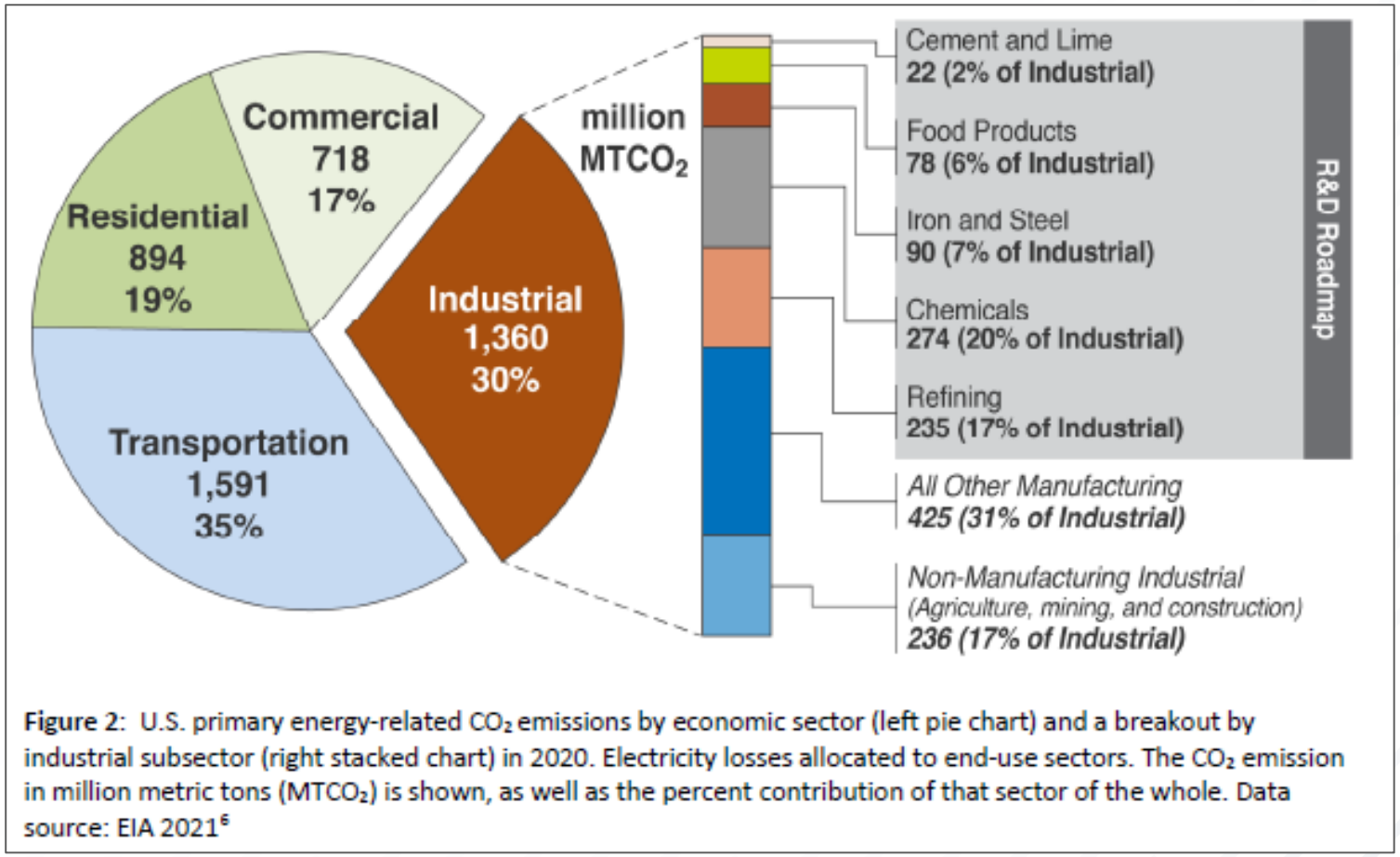
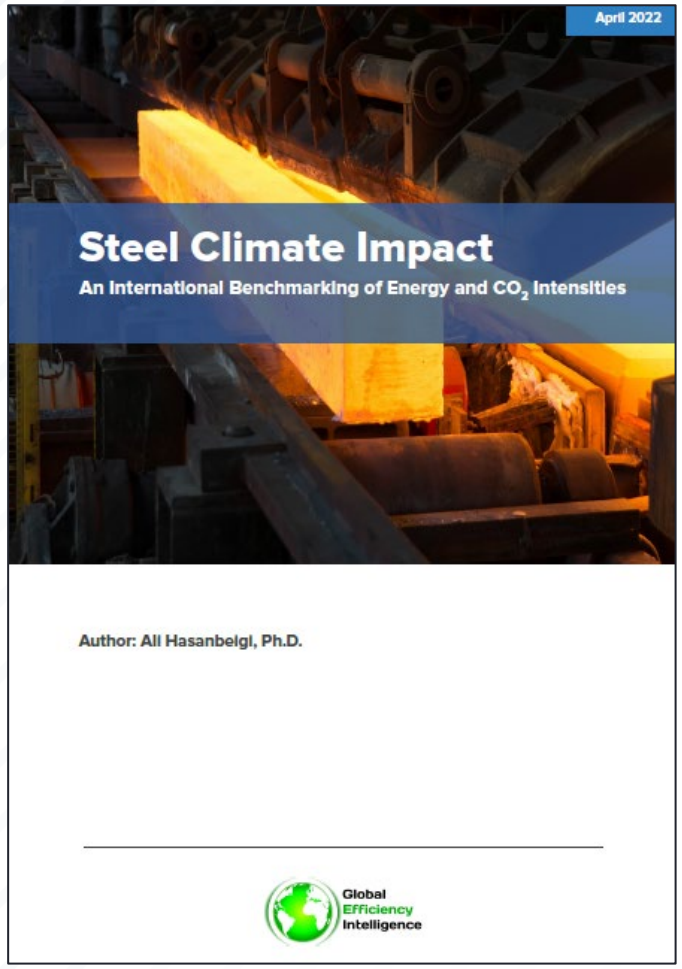
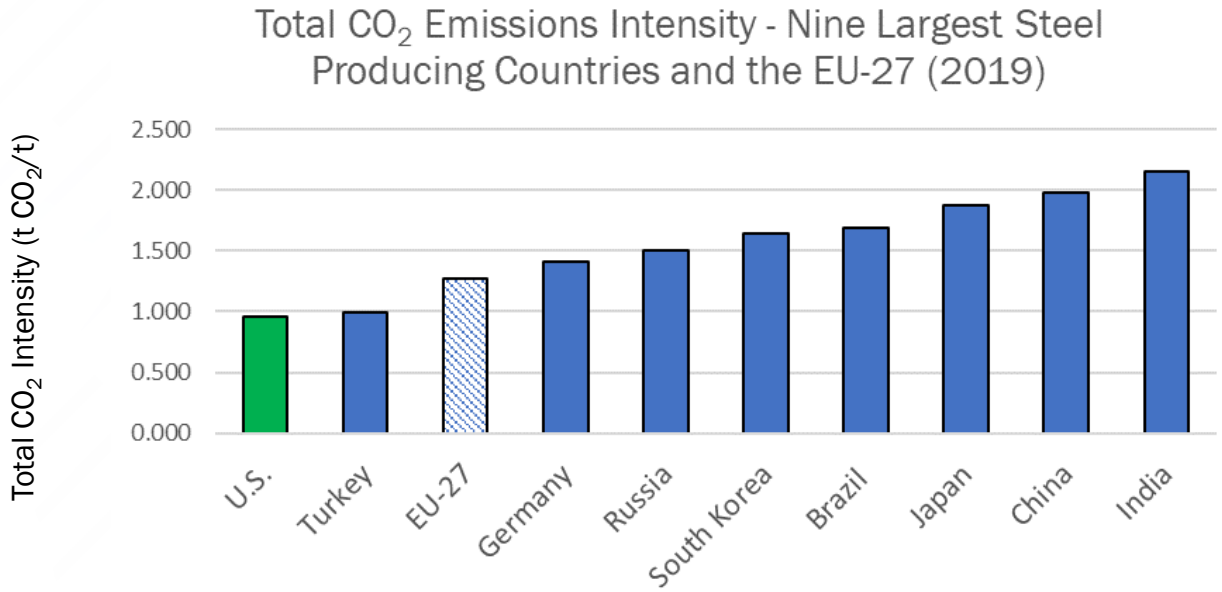


Figure 2: U.S. primary energy-related CO_2 emissions by economic sector (left pie chart) and a breakout by industrial subsector (right stacked chart) in 2020. Electricity losses allocated to end-use sectors. The CO_2 emission in million metric tons ($MTCO_2$) is shown, as well as the percent contribution of that sector of the whole. Data source: EIA 2021[6]

DOE RFI on Industrial Decarbonization Priorities, DOE-FOA-0002687, 1/27/2022

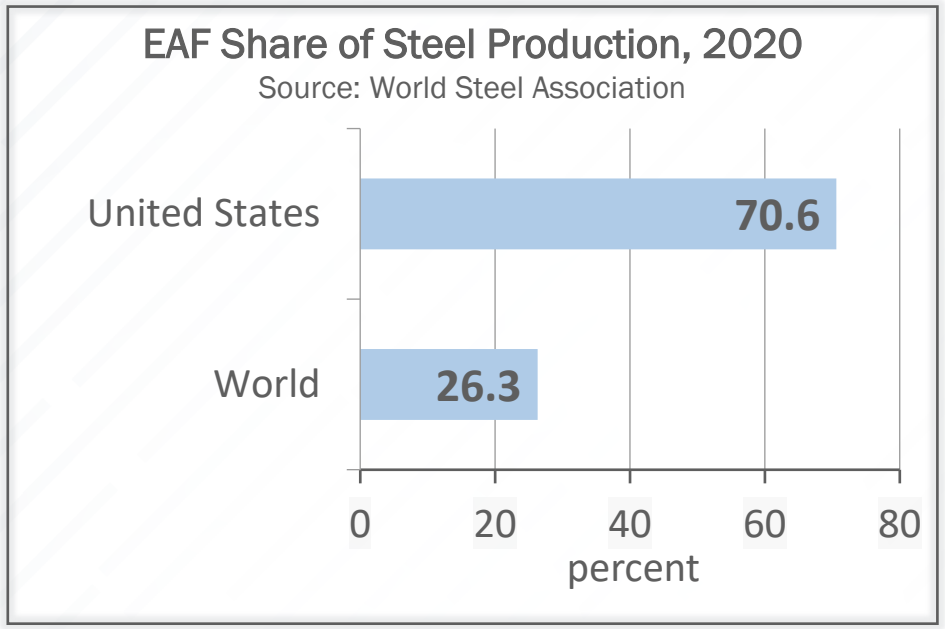
SUSTAINABLE AMERICAN STEEL





Adapted from: Hasanbeigi, "Steel Climate Impact: An International Benchmarking of Energy and CO_2 Intensities," Global Efficiency Intelligence, 2022.

WHAT MAKES AMERICAN STEEL SUSTAINABLE?



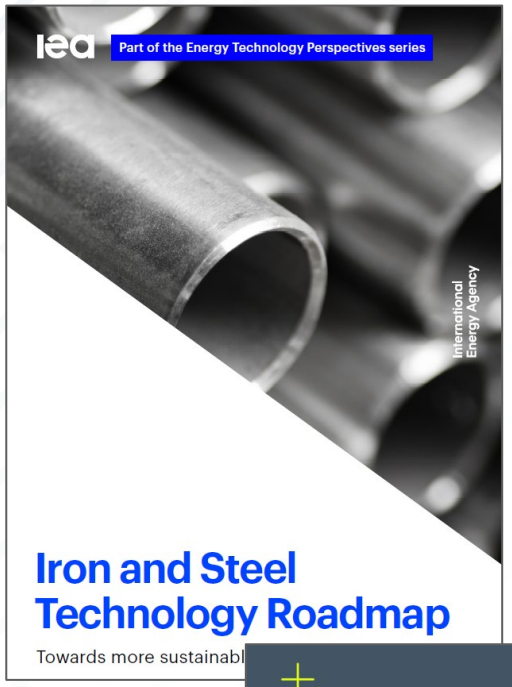
- The U.S. makes much more of its steel from Electric Arc Furnace (EAF) mills than many other regions
- Integrated mills use pelletized iron, not the lower quality sintered iron used in China and elsewhere
- Domestic mills use a much higher percentage of natural gas vs. coal

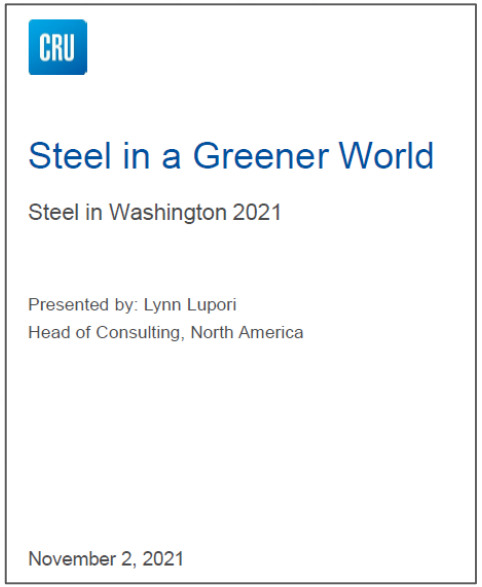
CONTINUING EFFORTS TO ENHANCE SUSTAINABILITY

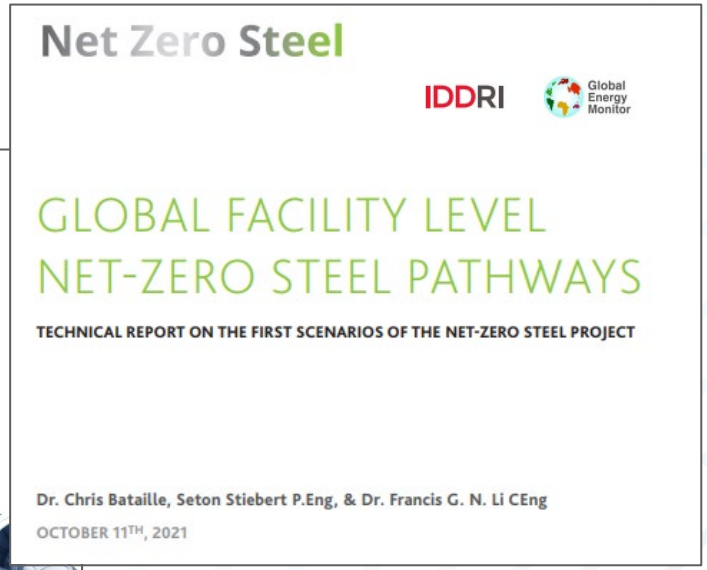
Work is also underway on projects to further enhance the sustainability of domestic steelmaking:

- Advancements in the use of Direct Reduced Iron (DRI) and Hot Briquetted Iron (HBI) in place of coal-based pig iron in both integrated and EAF steelmaking
- Using renewable energy-based hydrogen as a reduction agent in DRI/HBI production
- Capturing and using/storing CO_2
- Increasing use of renewable energy in steel industry facilities

MANY ARE STUDYING STEEL DECARBONIZATION





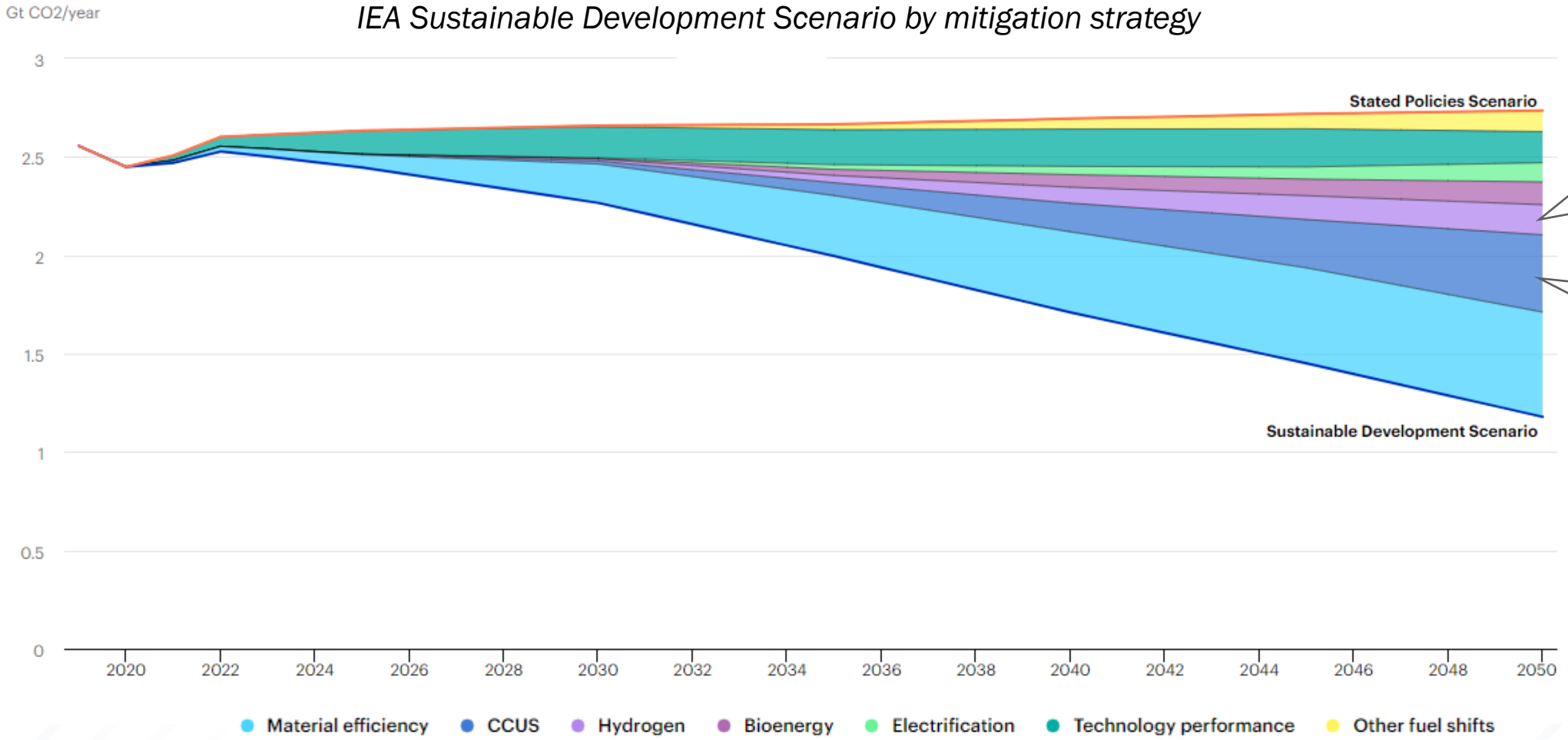


KEY THEMES FOR DECARBONIZATION

1. Material efficiency
2. BF/BOF efficiency
3. Electrification
4. Biomass reductants & other fuel shifts
5. Carbon capture, usage, and storage
6. Increase share of scrap-based EAFs
7. Optimize DRI and EAF using natural gas
8. DRI and EAF using hydrogen

THE ROLE OF CCUS AND HYDROGEN FOR FUTURE REDUCTIONS

CO_2 emissions reductions in the iron and steel sector in the IEA Sustainable Development Scenario by mitigation strategy



Hydrogen

CCUS

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IEA, 2020, https://www.iea.org/data-and-statistics/charts/iron-and-steel-sector-direct-co2-emission-reductions-in-the-sustainable-development-scenario-by-mitigation-strategy-2019-2050-2

SCIENCE-BASED TARGETS INITIATIVE (SBTI)

ABOUT US

The Science Based Targets initiative (SBTi) drives ambitious climate action in the private sector by enabling companies to set science-based emissions reduction targets.

SCIENCE BASED TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

Steel

We're developing science-based target setting methodologies, tools and guidance for **steel** companies and other stakeholders. Our aim is to help companies to understand and implement the level of climate ambition required to meet the **1.5˚C** goal of the Paris Agreement.

Guidance expected to be published Q2 2023

SUMMARY

- Automotive companies are (or have already) set targets for greenhouse gas emissions reductions
  - Trend is happening across many sectors and countries
  - Many striving for near-term reductions and long-term neutrality or net zero
- Materials in the vehicle supply chain, like steel, are a key component of automotive company sustainability strategies
- The American steel industry is already the least carbon intensive of all major steel producing countries
- Efforts continue by all American steel companies to further reduce greenhouse gas emissions from their production processes
- Steel is an innovative material that can help automotive companies meet their design objectives, lightweighting goals, and enable their sustainability strategies

FOR MORE INFORMATION

Brandie M. Sebastian

American Iron and Steel Institute

bsebastian@steel.org

American Iron and Steel Institute