Greening Steel: How the auto industry can drive change

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Agenda

- Motivation
- Key results from ICCT's research:
    1) Pathways to decarbonize automotive steel
    2) Current automotive steel supply chains
    3) Automakers' green steel commitments
- Panel discussion
- Q&A

Panelists

Moderator

Anh Bui
ICCT
Researcher

Presenter

Marta Negri
ICCT
Associate Researcher

Panelist

George Luckey
Ford
Manager of the Advanced Metal Technology Department

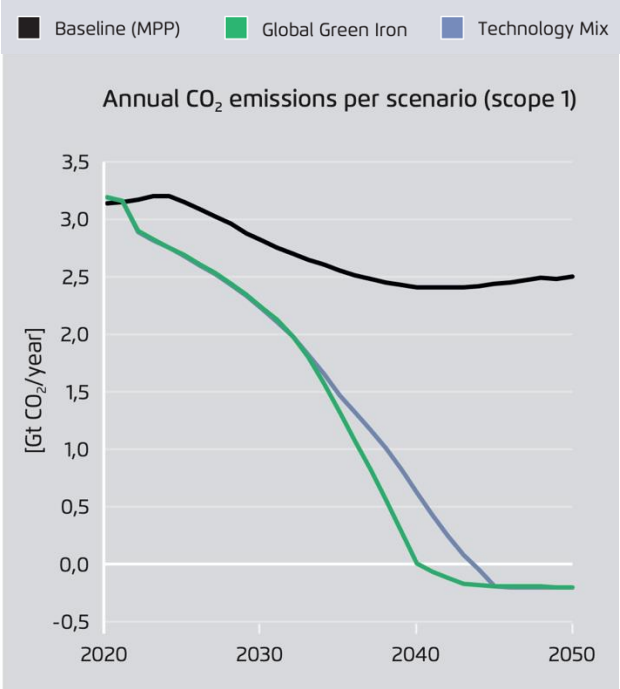
Panelist

Samuel Flückiger
thyssenkrupp Steel
Head of EU Climate & Circular Economy Policy

Decarbonizing the steel sector reduces global emissions and requires investments

- Steel is the industry sector with highest emissions, contributing **7% of GHG emissions globally**
- Steel decarbonization scenarios:
  - IEA (2021): -25% of emissions by 2030, -90% of emissions by 2050
  - Agora (2023): net zero by 2040 is possible
- Decarbonization requires replacing coal-based blast furnace plants by new **green steel production**
- **Investments are needed** to scale-up green steel production capacities

Steel sector decarbonization scenarios



Agora Industry (2023). 15 insights on the global steel transformation

Key results from ICCT’s research

The climate impact of transport includes vehicle production: Decarbonizing steel is key!

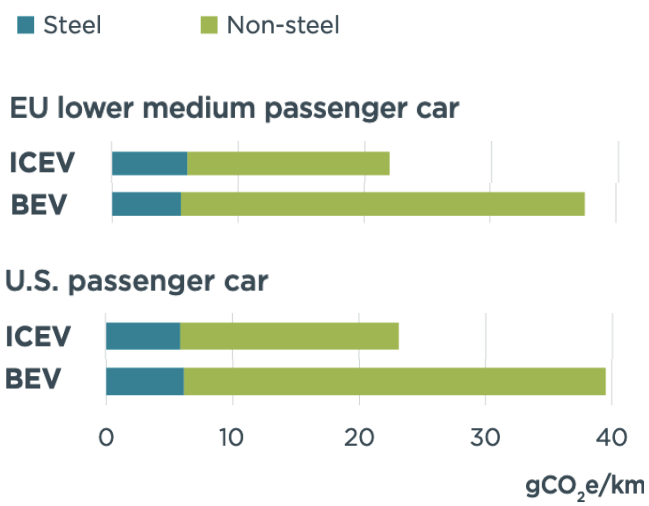
Automotive sector is an **ideal lead market** for fossil-free primary steel:

- 12% of steel demand globally (26% in U.S., 17% in EU)
- High-quality automotive steel, typically primary steel

Share of steel in **vehicle production emissions:**

- 27% for ICEVs
- 15% for BEVs

Vehicle production GHG emissions for baseline case (BF-BOF)



Bui et al. (2024). Technologies to reduce GHG emissions from automotive steel in the U.S. and the EU

Switching to fossil-free steel reduces steel-related emissions of vehicle production by more than 95%

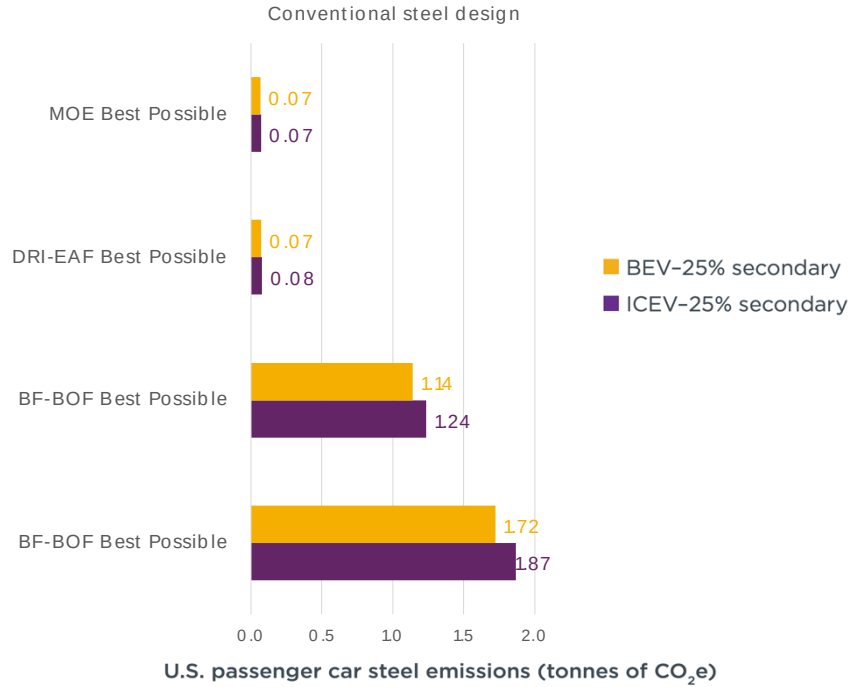
Three parallel strategies:

1) **Fossil-free primary steel production technologies**
2) Increase availability of high-quality recycled steel
3) Less steel: lightweighting

Green hydrogen-based steel:

- Reduces steel-related **emissions** by > **95%**
- Increases vehicle **costs** by only about **1%**

Steel-related emissions of vehicle production (t CO_2e)



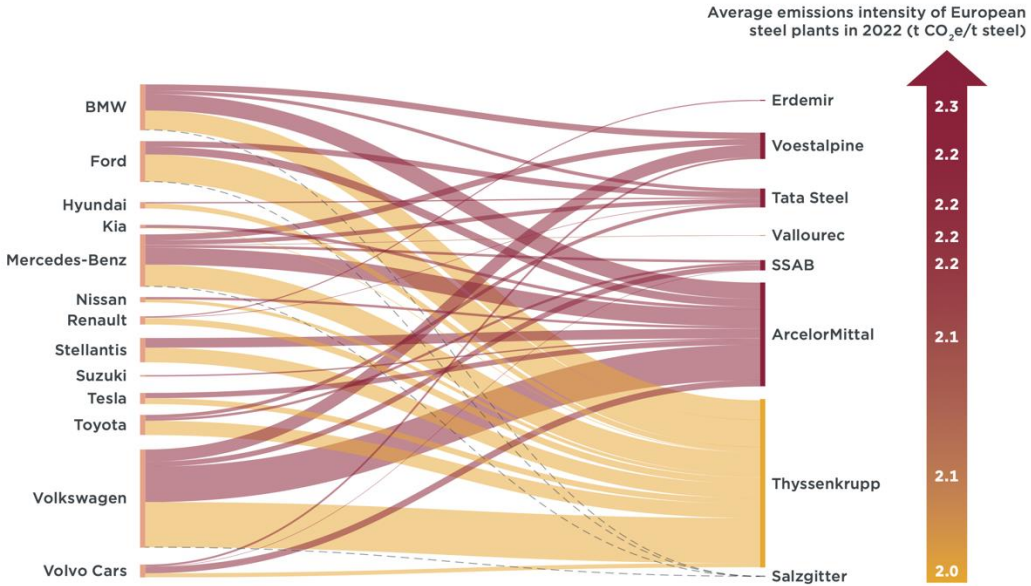
Bui et al. (2024). Technologies to reduce GHG emissions from automotive steel in the U.S. and the EU

Automakers buy steel from steel producers with above-average coal use

Analysis of **steel supply chain** for global vehicle production of **17 key automakers**:

- Steel supplied to automakers in **Europe** has an **above industry average** emissions intensity (> 2 t CO_2e / t steel)
- Also on a **global level**, emissions intensity of the automakers' regional steel purchases is **above steel industry average in most regions**

Financial relations for vehicle production in Europe

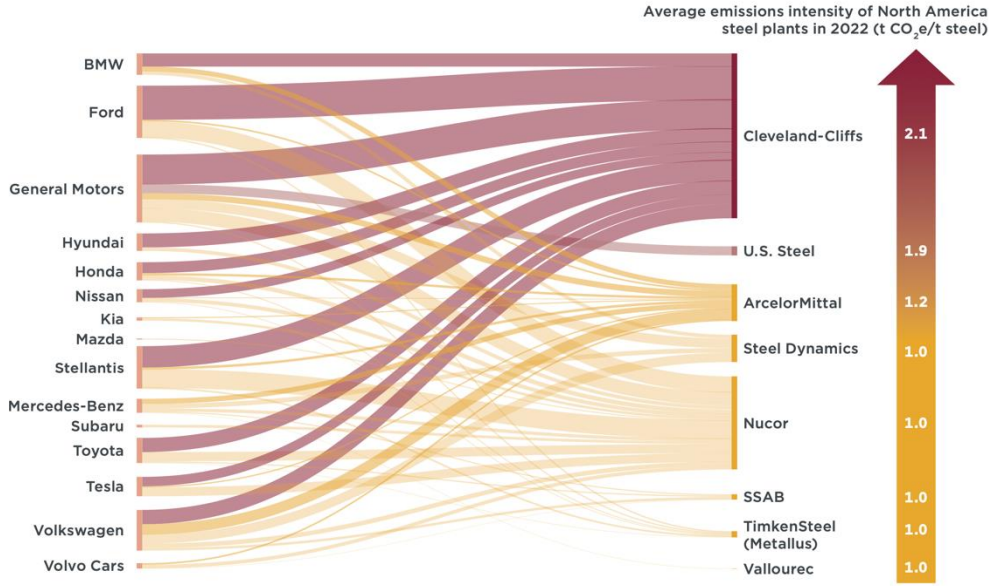


Negri et al. (2024). Which automakers are shifting to green steel? An analysis of steel supply chains and future commitments to fossil-free steel

Automakers buy steel from steel producers with above-average coal use

- Also in **North America**, despite a generally higher share of recycled steel in the industry than in Europe, steel supplied to automakers has an **above industry average emissions intensity**
- Most of the selected automakers in North America procure from highly polluting steel producers

Financial relations for vehicle production in North America



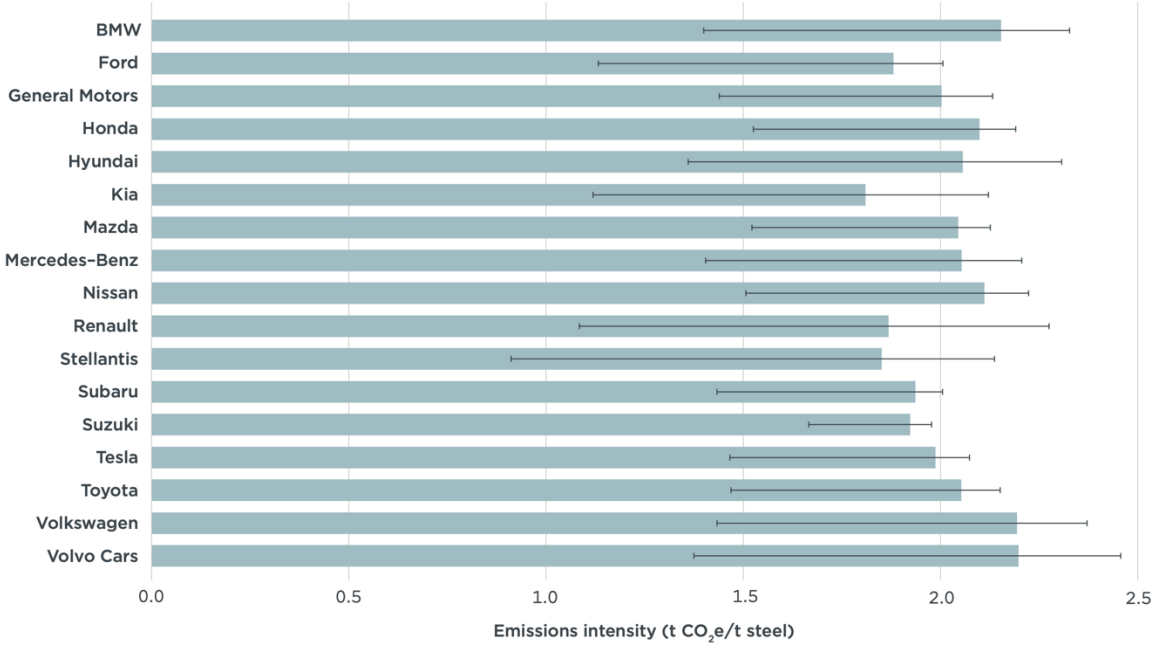
Negri et al. (2024). Which automakers are shifting to green steel? An analysis of steel supply chains and future commitments to fossil-free steel

Today, all automakers are estimated to have similarly high emissions intensity of steel

Translating from steel producer-level to automakers:

- **Central estimate** assumes that automakers procure their suppliers' regional average emission intensity steel
- **Sensitivities** assume that only steel from the individual steel supplier's regional plant with the highest/lowest emission intensity are used

Automakers' global average emissions intensity of steel



Negri et al. (2024). Which automakers are shifting to green steel? An analysis of steel supply chains and future commitments to fossil-free steel

For 2030, few automakers make commitments to support scaling up green steel production

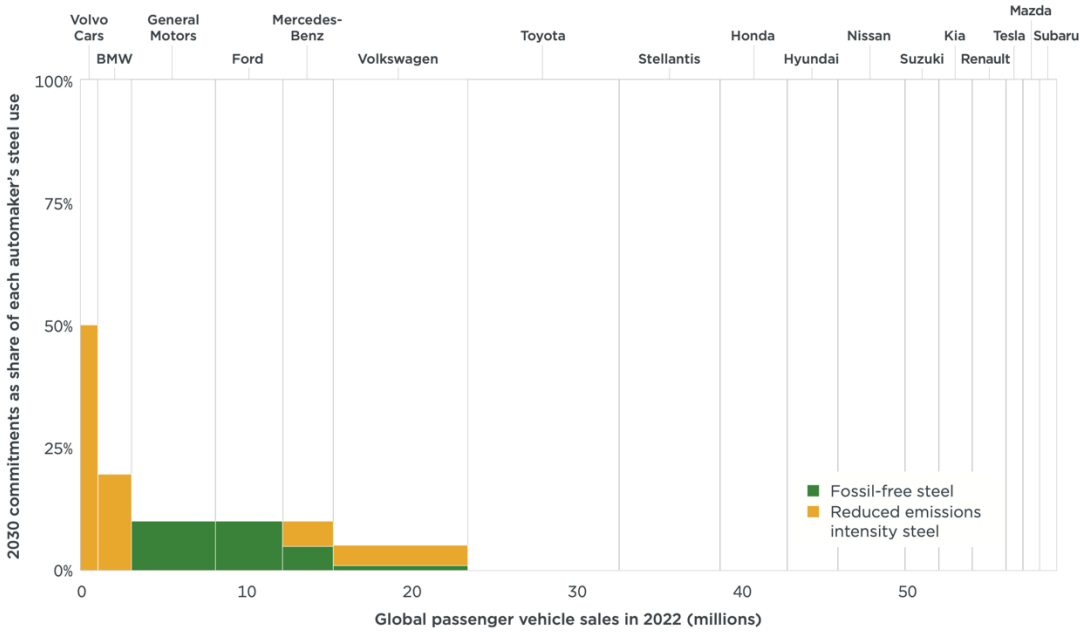
Automakers' future commitments:

- Commitments for **fossil-free steel** procurement in 2030 are **2%** of the automakers' global steel demand
- Commitments for **reduced emissions intensity steel** add another **2%**
- But: reducing steel emission by **25%** by 2030 needed to be on 1.5°C-aligned pathway

Note: Fossil-free steel includes green hydrogen DRI-EAF steel or compatible with FMC and/or ResponsibleSteel Level 4.

Reduced emissions steel includes other production pathways, with emissions intensity below industry standard.

Automakers' public steel procurement commitments for 2030, as a share of their global steel use



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Opportunities for the auto industry and policymakers

- Automakers could **demonstrate demand for green steel** (ideally 25% fossil-free steel by 2030) by signing pre-purchase agreement, directly investing in companies developing fossil-free capacities, or joining industry initiatives; increase the availability of high-quality recycled steel by **optimizing vehicle design for recyclability** and reducing the contamination of steel with copper during the recycling process; increase **disclosure** of emissions intensity and recycled steel content, and increase **lightweight design** to reduce steel use.

- Policymakers could support the industry by providing **subsidies for scaling up fossil-free steel production**; introducing industry **emissions trading systems** (ETS) covering the steel sector; incentivizing the use of of fossil-free steel in vehicle production, e.g., by requiring vehicles to meet average GHG emissions intensity threshold or **green steel content quotas;** and increase circular use of steel by **requiring vehicles to be designed for recycling**, improve sorting of metals parts during vehicle dismantling and shredding, and requiring a **recycled steel quota** in newly built vehicles**.**

Additional resources

- Decarbonization paper link: https://theicct.org/publication/technologies-to-reduce-ghg-emissions-automotive-steel-US-EU-jul24/

- Supply chain mapping and automaker commitments link: https://theicct.org/publication/green-steel-automakers-US-Europe-sep-24

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Discussion

Thank you!

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