International Transport Forum

New but used: The implications of the electric vehicle transition on second-hand vehicle flows in emerging markets

9th ITF Statistics Meeting
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Project background

The transition to **electric vehicles** is gathering pace as a key pillar for decarbonising the global passenger car fleet.

However, the speed of adoption of electric vehicles varies significantly between countries. New vehicle technologies are typically adopted first in wealthier regions and only later elsewhere, often as exported **second-hand cars**.

There remains significant uncertainty about how quickly electrified vehicles will enter the passenger car fleets of the Global South through second-hand exports and new sales. Emerging economies risk being **flooded with unwanted conventional vehicles** or having ill-suited electricity infrastructure to facilitate the adoption of electric vehicles.

This report will address these and other questions with a particular forward-looking focus on the implication of battery electric vehicles being traded as second-hand vehicles.

What are the themes that we want to cover?

Part 1: Understanding current status quo

- How old are car fleets in emerging economies?
- How are they replaced by second hand vehicles vs. new sales?
- What are the timescales for fleet turnover in emerging economies?

Part 2: Exploring possible scenarios of electric vehicle adoption

- How quickly might electric vehicles enter vehicle fleets in emerging economies?
- How much might be through new sales vs. used imports from developed economies?
- What if developed economies hold on to batteries to recycle?
- How much might low electrification rates constrain adoption?

Focus likely on passenger cars due to data availability.
Impacts on vehicle CO_2 emissions, air pollution and safety will be referenced but detailed assessments will likely be reserved for future work.

Our approach

1) Gather insights from CPB member expertise and external workshop participants from leading experts
   → Carried out 6th of March 2023

2) Aim to gather as much data as possible on second hand vehicle sales
   → statistical analyses of status quo (ongoing)

3) Aim to refine existing ITF fleet model to better account for emerging economies
   → scenario analyses (ongoing)

4) Distill key policy challenges and build on existing assessments
   → Report to be published in 11/2023

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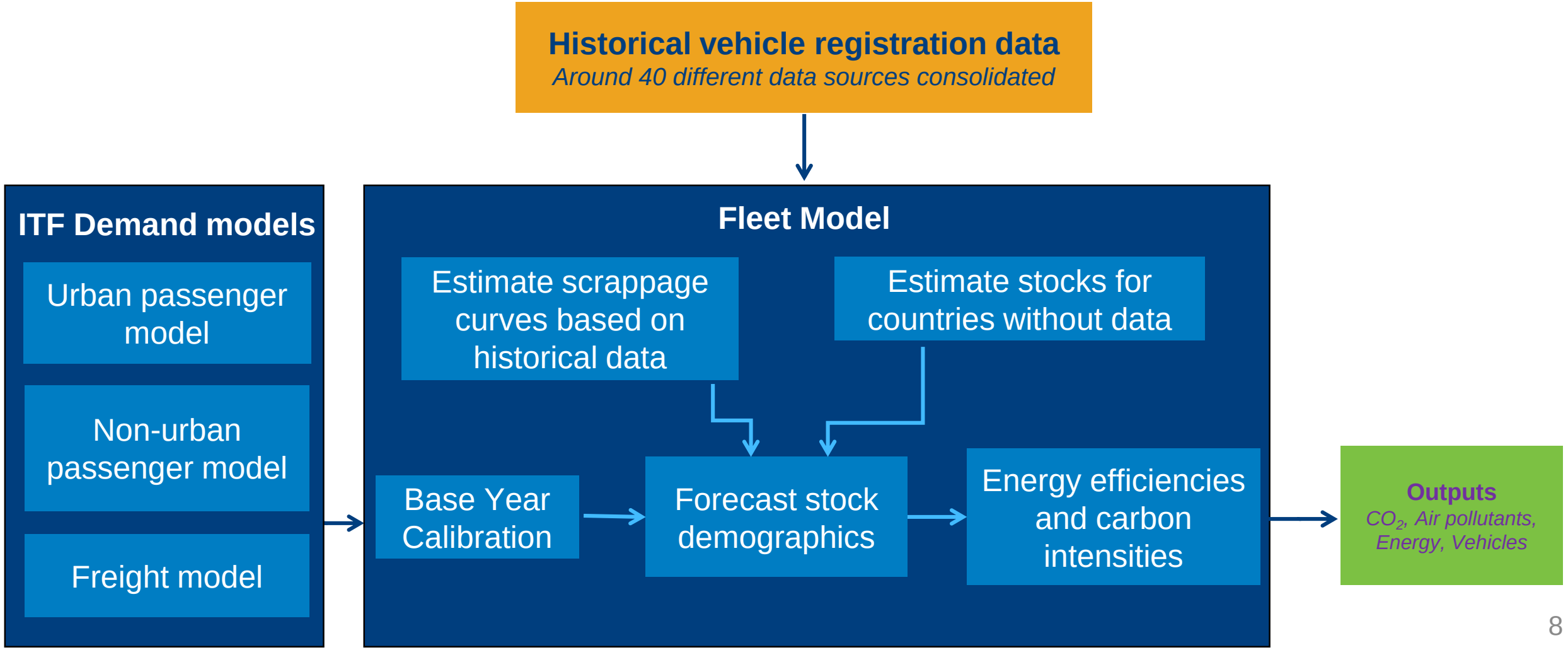
Decarbonising Transport Initiative

A short introduction to the

ITF fleet model

Framework


Historical vehicle registration data
Around 40 different data sources consolidated
ITF Demand models
Urban passenger model
Non-urban passenger model
Freight model
Fleet Model
Estimate scrappage curves based on historical data
Estimate stocks for countries without data
Base Year Calibration
Forecast stock demographics
Energy efficiencies and carbon intensities
Outputs
CO_2, Air pollutants, Energy, Vehicles

Framework

ITF Demand models

Urban passenger model

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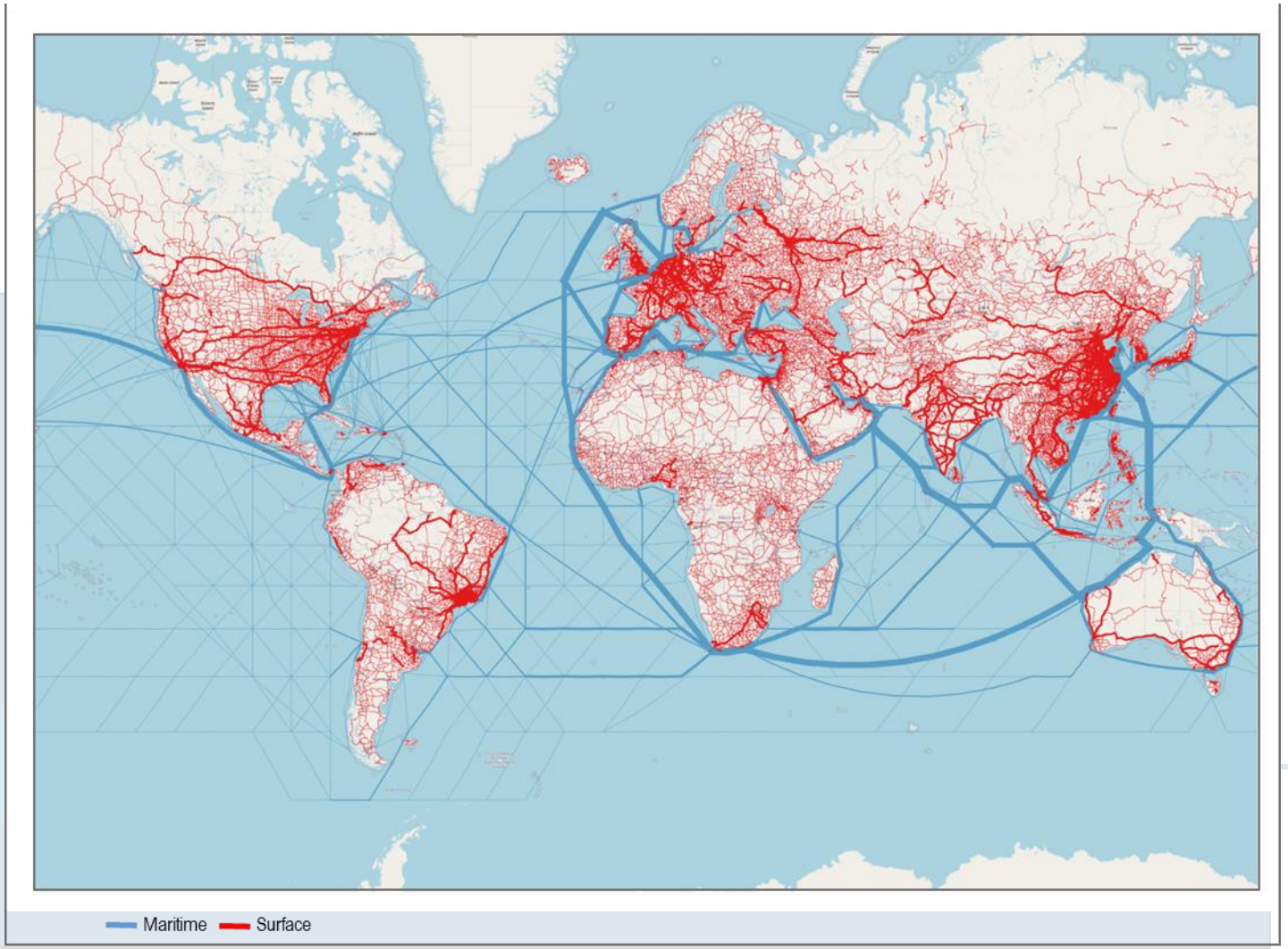

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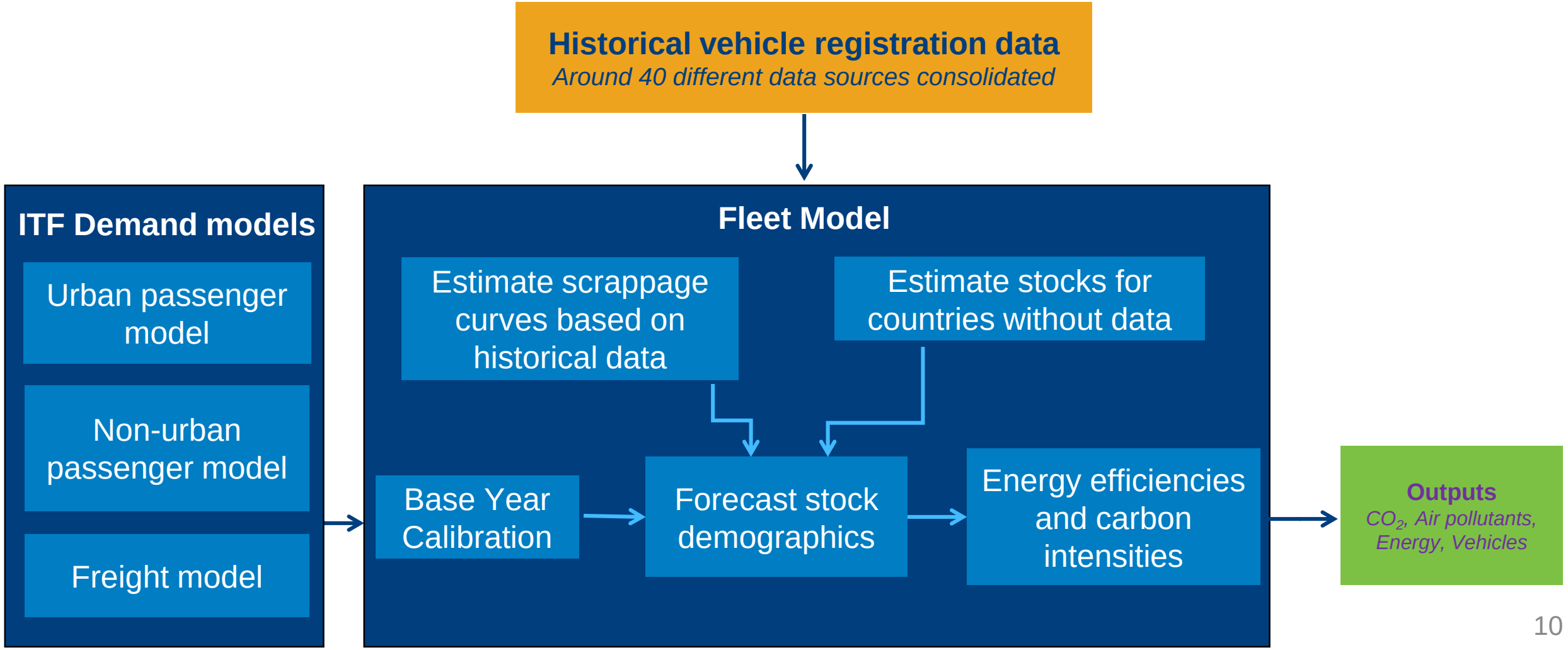
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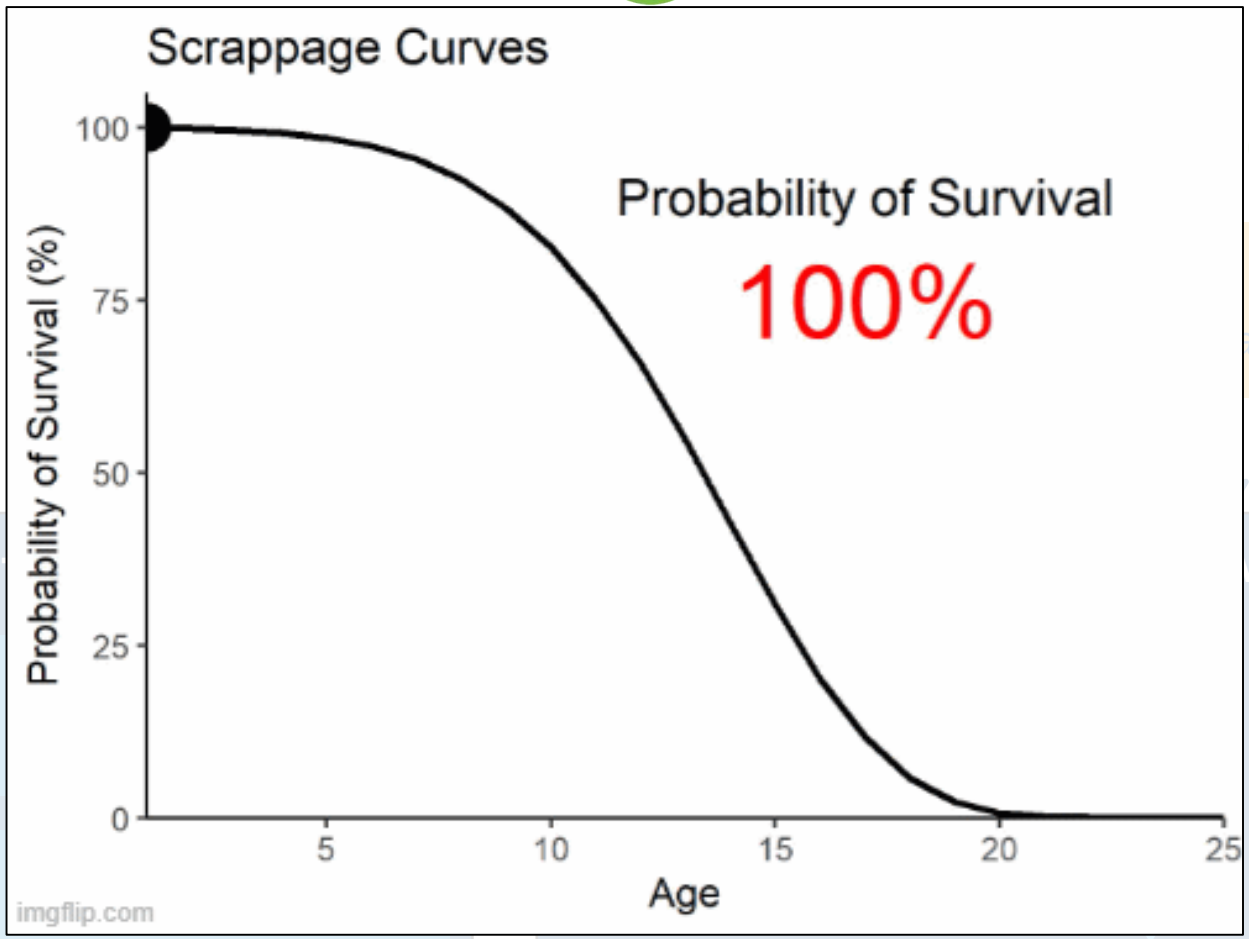

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Model

Estimate stocks for countries without data

passenger model

Freight model

Base Year Calibration

Forecast stock demographics

Energy efficiencies and carbon intensities

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ITF Demand models

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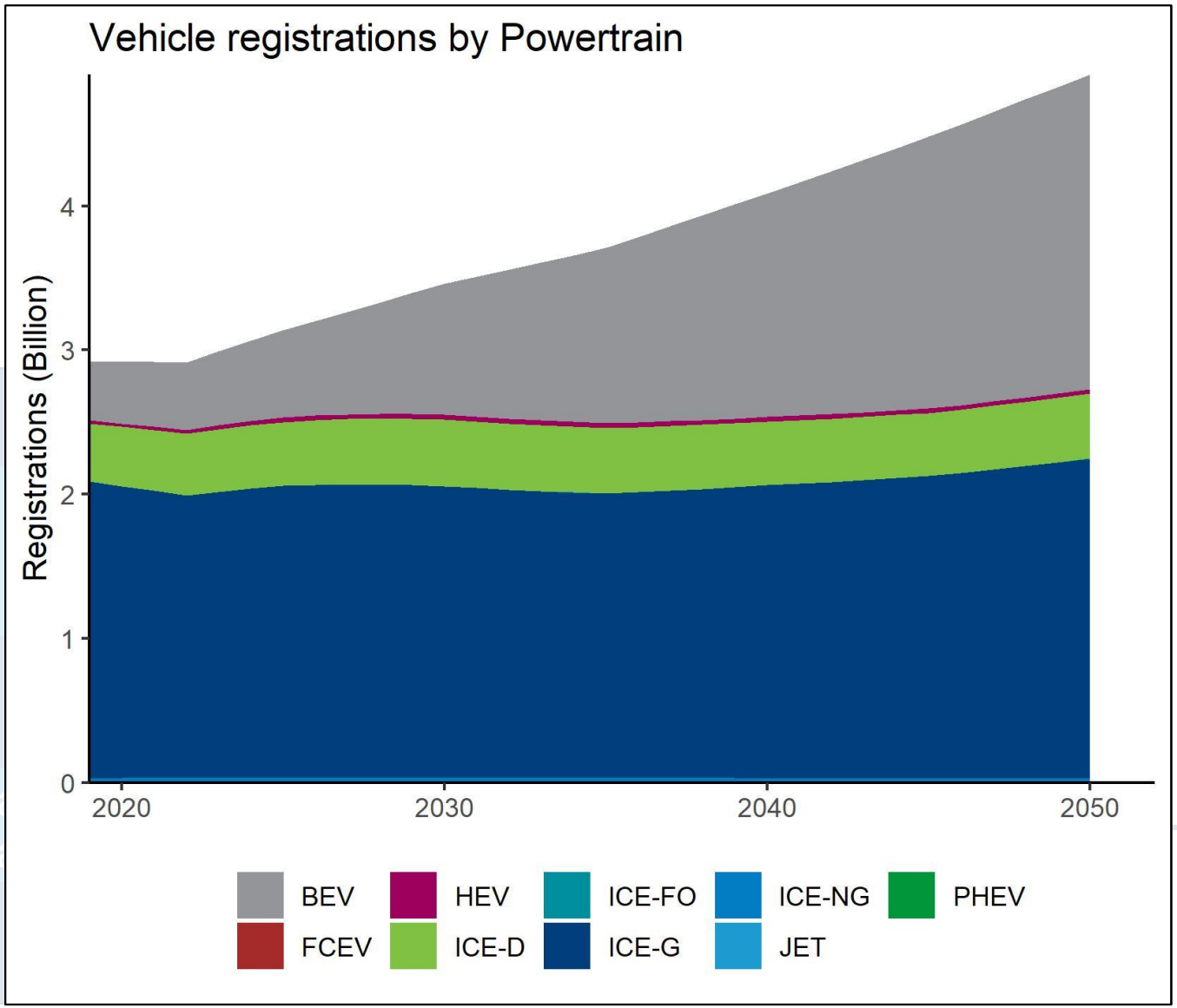
Non-urban passenger model

Freight model



Outputs

CO_2, Air pollutants, Energy, Vehicles

Missing piece of the puzzle: 2nd hand vehicle data

What we have:

- Vehicle in use
- New vehicle registration for different powertrain types (diesel, hybrid, BEV)
- Vehicle de-registrations (implicit)

What we <u>don't</u> have:

- Composition of registrations over type
  - New sale or imported car?
- What happens next?
  - End-of-life/scrapyard?
  - Export? Where to?

Discussion: Are these data recorded? What challenges do you/would you face?

- Used vehicle imports?
- Used vehicle exports?

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Thank you.