Marshall Edgeworth: Riding the carbon trails of the great investment plains

Stijn Ferrari | IFC Satellite Seminar on “Sustainability data issues and central banks”, 4 October 2025, Amsterdam

National Bank OF BELGIUM
Eurosystem

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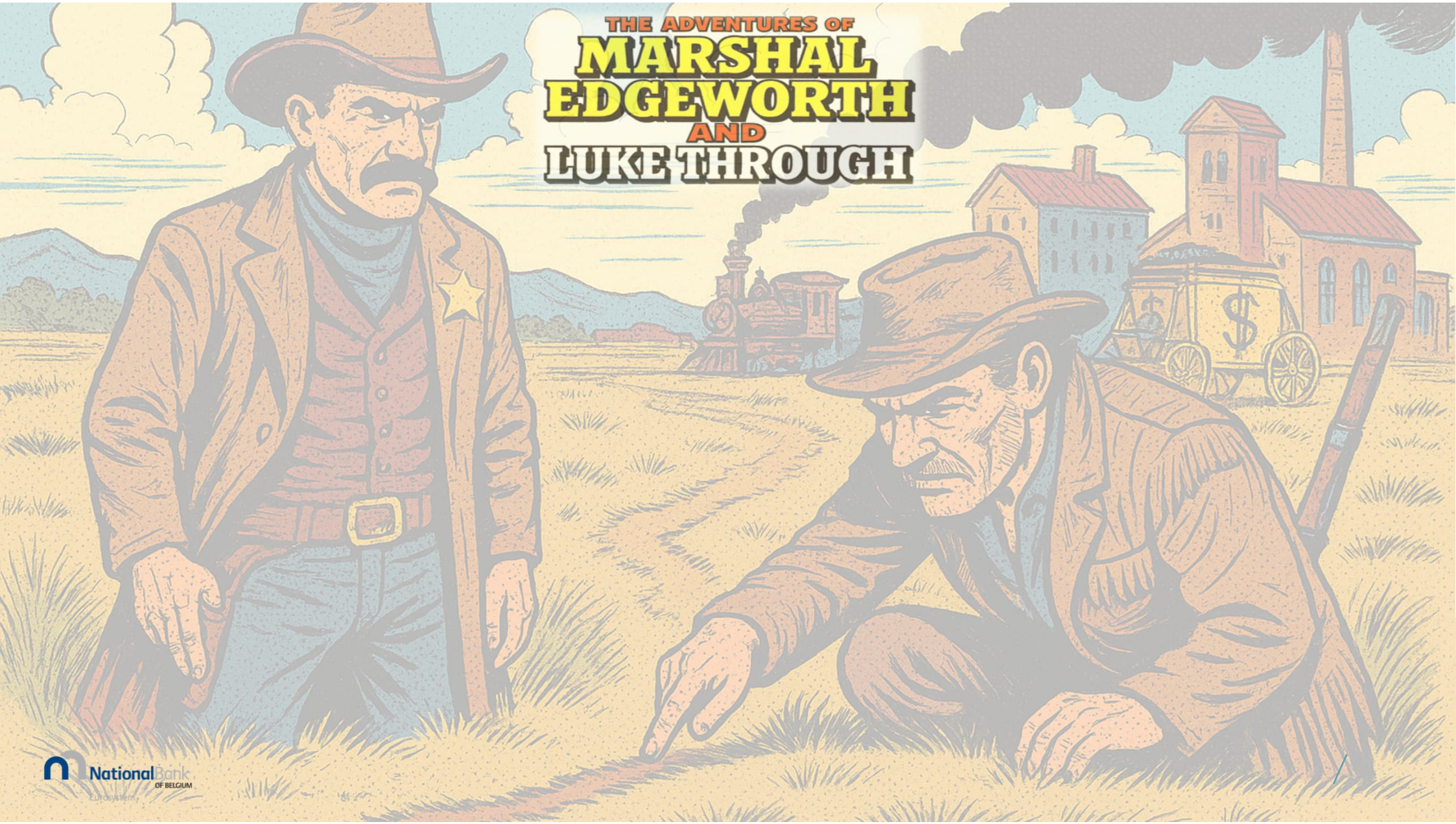
The results in this study may deviate from official statistics published by the National Bank of Belgium and the European Central Bank.



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THE ADVENTURES OF
MARSHAL EDGEWORTH
AND
LUKE THROUGH
Carbon profile of investment portfolios
Marshall-Edgeworth decomposition
Look-through approach

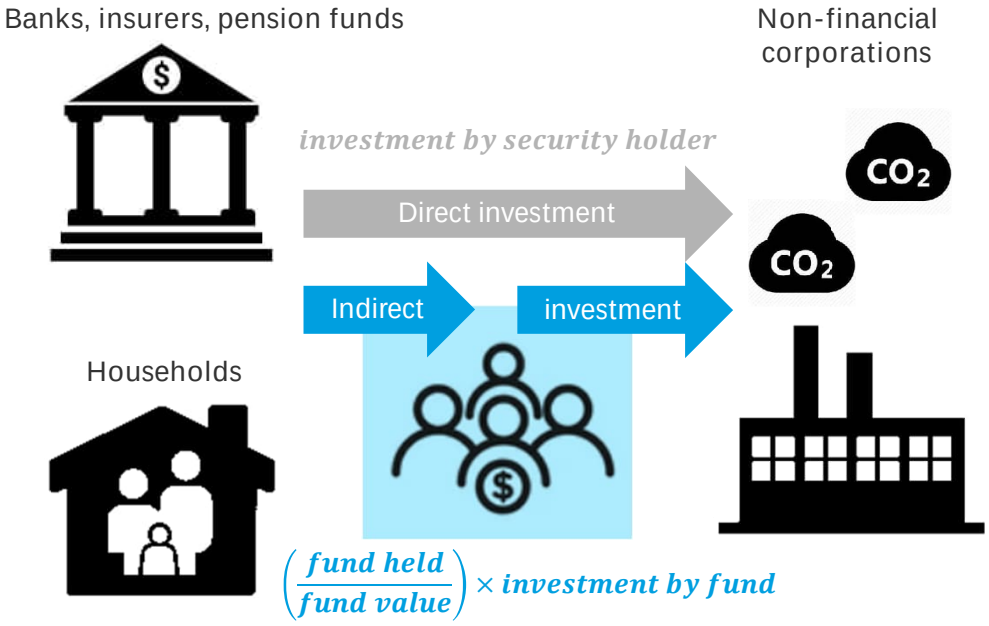
Toolkit for investors and financial supervisors (including central banks) for

1. Monitoring investment portfolios' carbon profile and exposure to transition risk
2. Evaluating the greening of the financial sector and its contribution to a net zero economy
3. Facilitating data validation and storytelling

Key insights on corporate emissions financed by Belgian financial corporations' and households

1. Corporate securities portfolios held by Belgian financial corporations and households are showing a decline in financed emissions
2. Including indirect investments significantly increases corporate financed emissions
3. Emission reductions by directly invested firms have beneficial impact on financed emissions
4. Direct investment transactions drive down emissions financed by financial corporations
5. Indirect investments via Luxembourgish and Belgian funds play a key role in reducing household-financed emissions…
6. … though aligned direct transactions highlight the need to examine underlying flows

Belgian financial corporations and households hold corporate securities both directly and through funds



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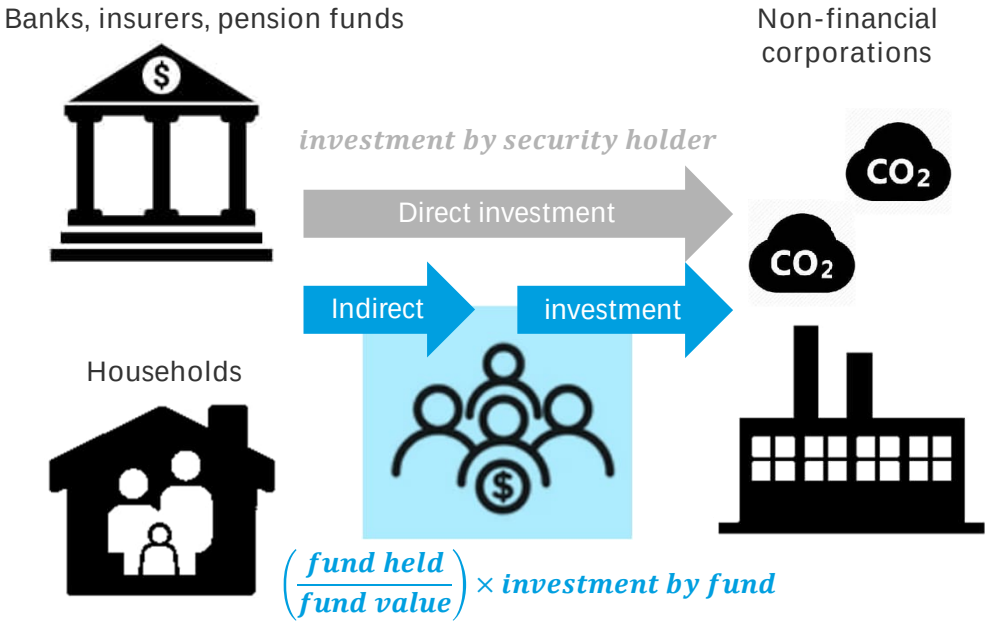
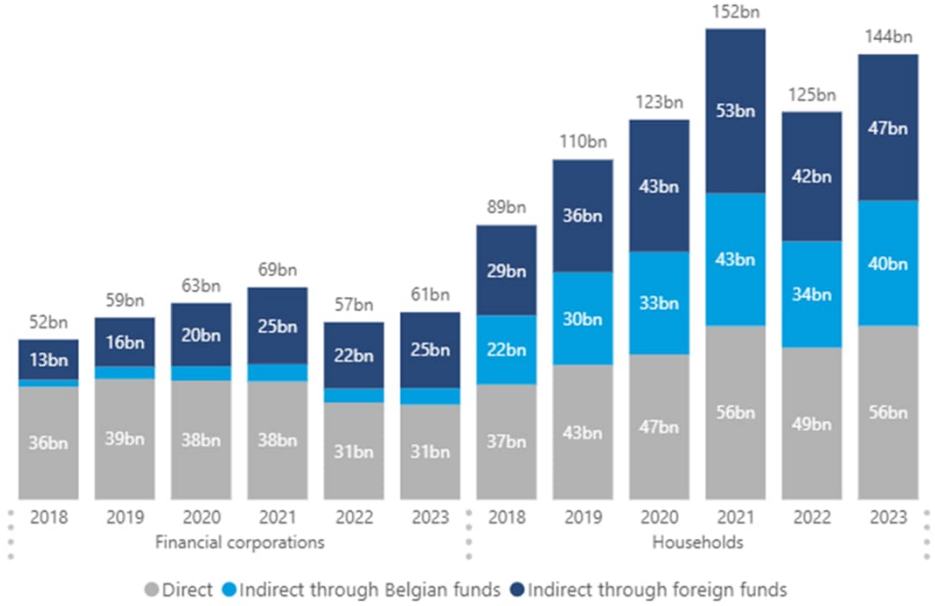


Direct and indirect investment in non-financial corporations



Source: NBB, ECB, ISS

Including indirect investments significantly increases corporate financed emissions

Financed emissions

$$= \boldsymbol{carbon\ emissions} \times \left(\frac{\boldsymbol{investment}}{\boldsymbol{company\ value}} \right)$$

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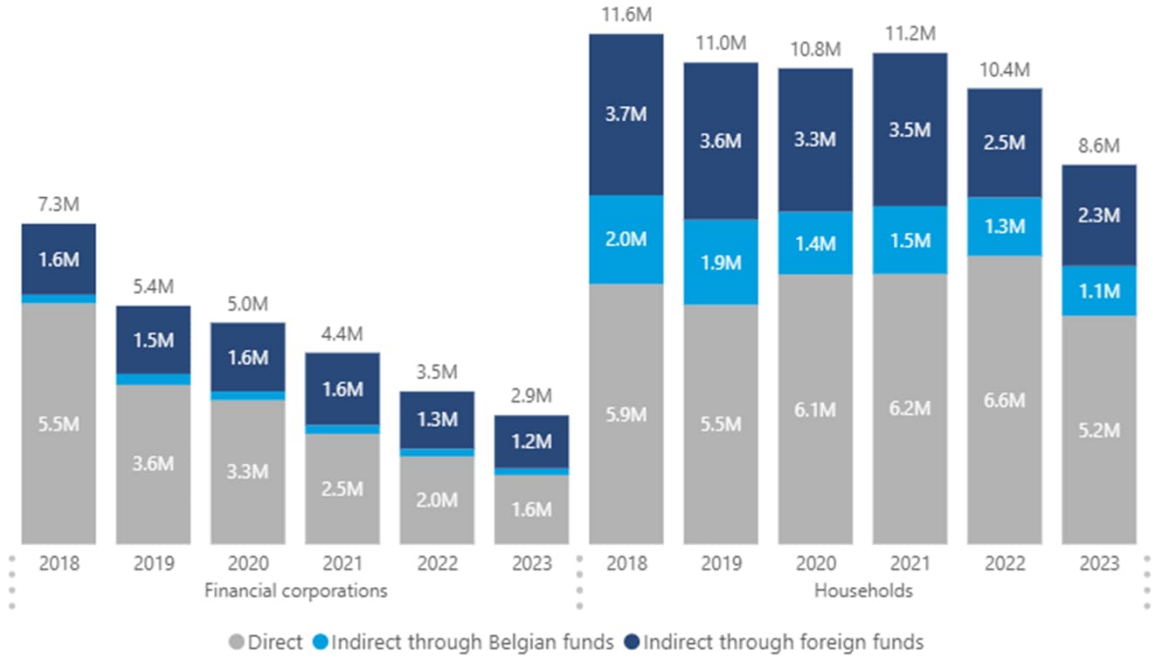
Directly and indirectly financed corporate emissions (scope 1)



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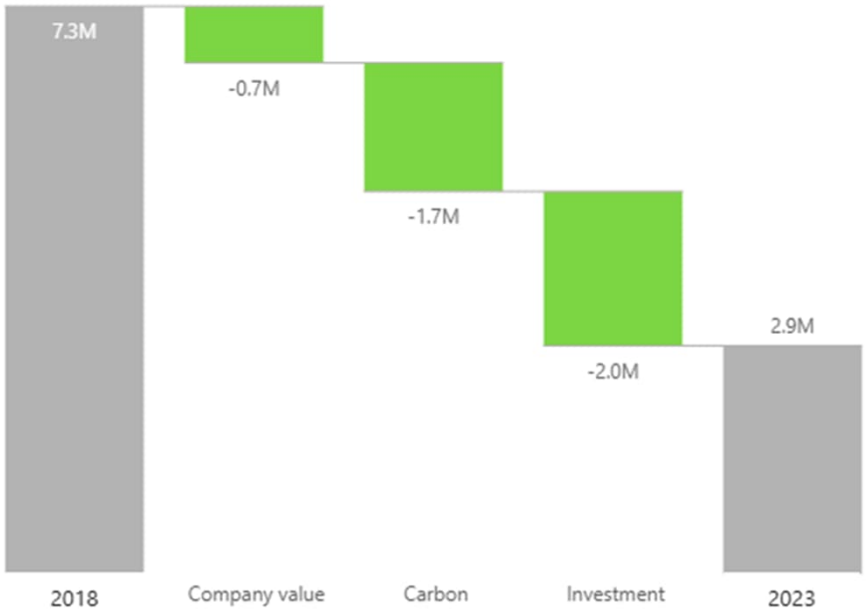
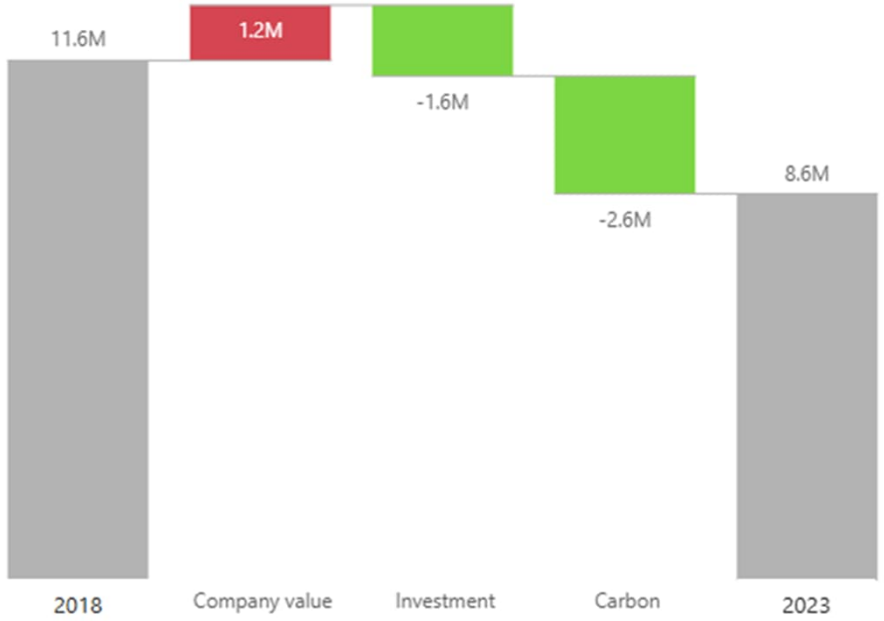
Investment decisions and carbon emission reductions are the main drivers of declining financed emissions

Financial corporations: baseline decomposition



Households: baseline decomposition



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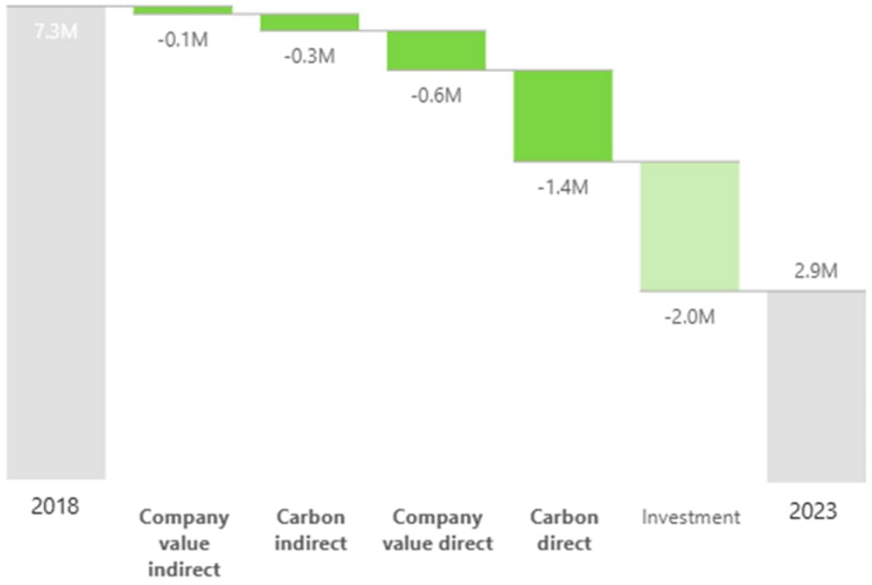
Beneficial impact of emission reductions stems mainly from directly invested firms

Financial corporations: firm characteristics decomposition



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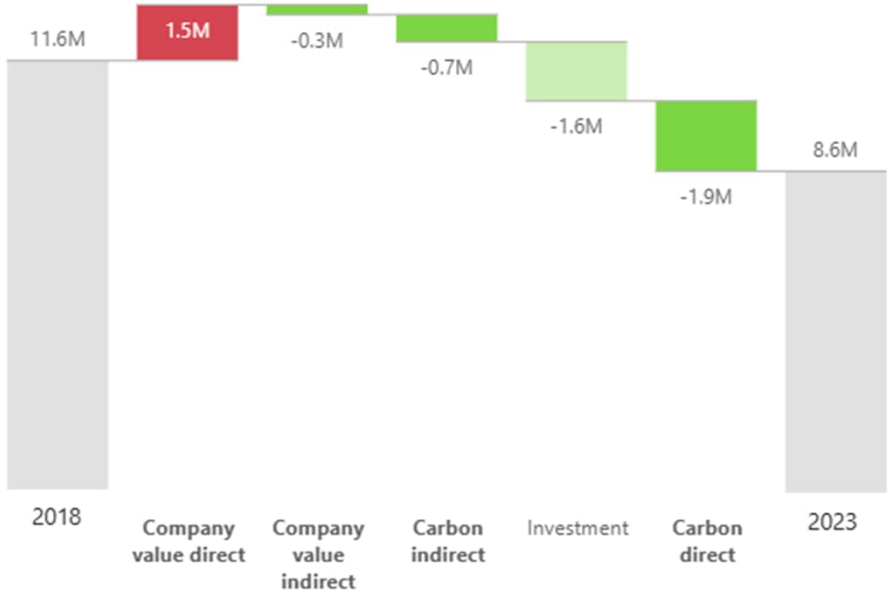
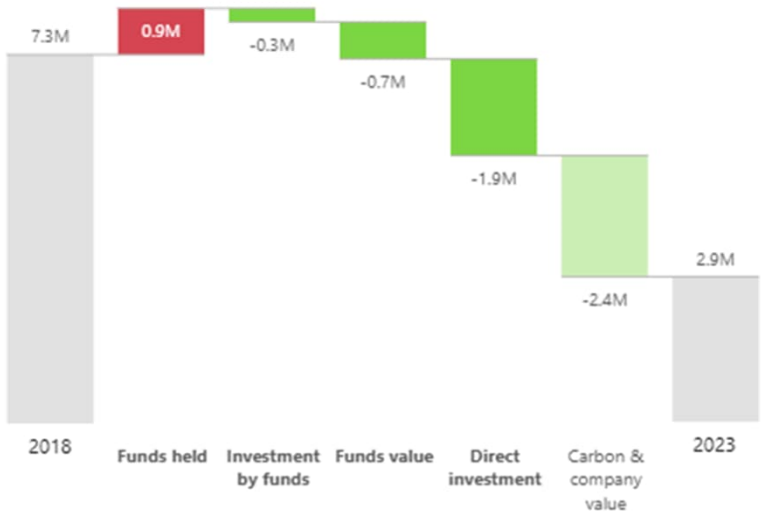


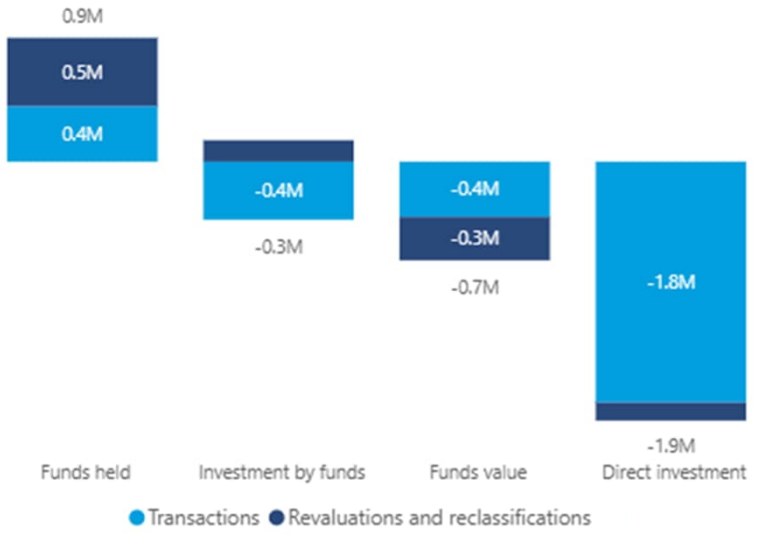
Source: NBB, ECB, ISS

Direct investment transactions have most pronounced impact on emissions financed by financial corporations

Financial corporations: investment components decomposition



Financial corporations: underlying investment flows (2018-2023)



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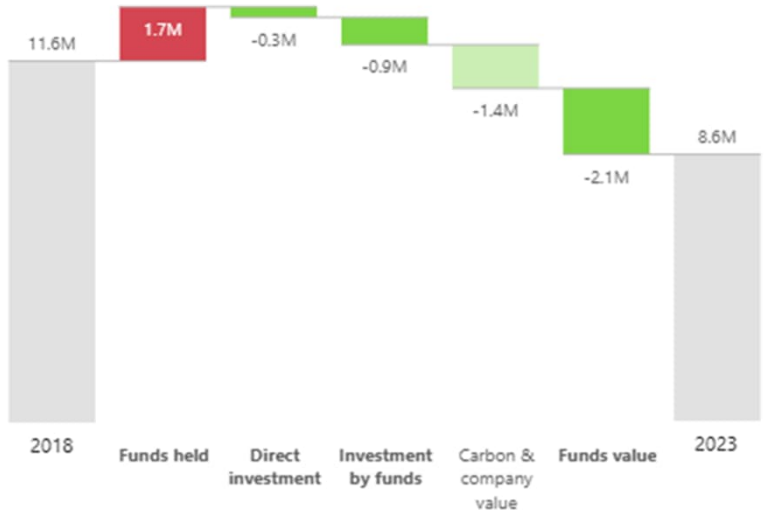
Indirect investments play a key role in reducing household-financed emissions, though aligned direct transactions highlight the need to examine underlying flows

Households: investment components decomposition



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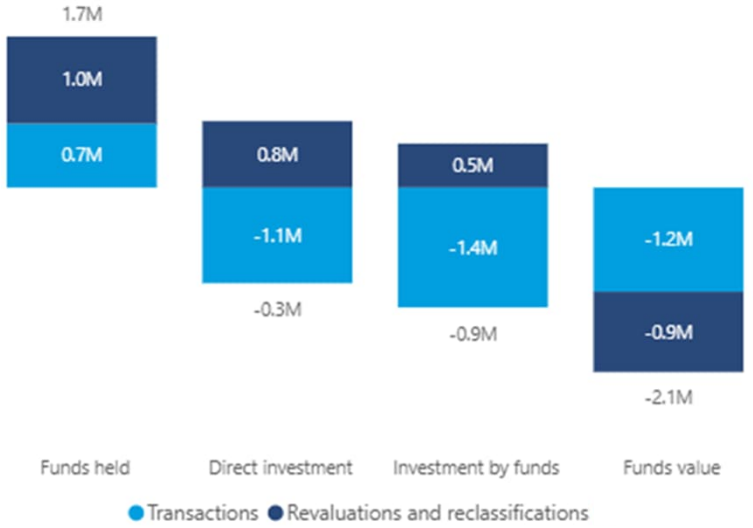
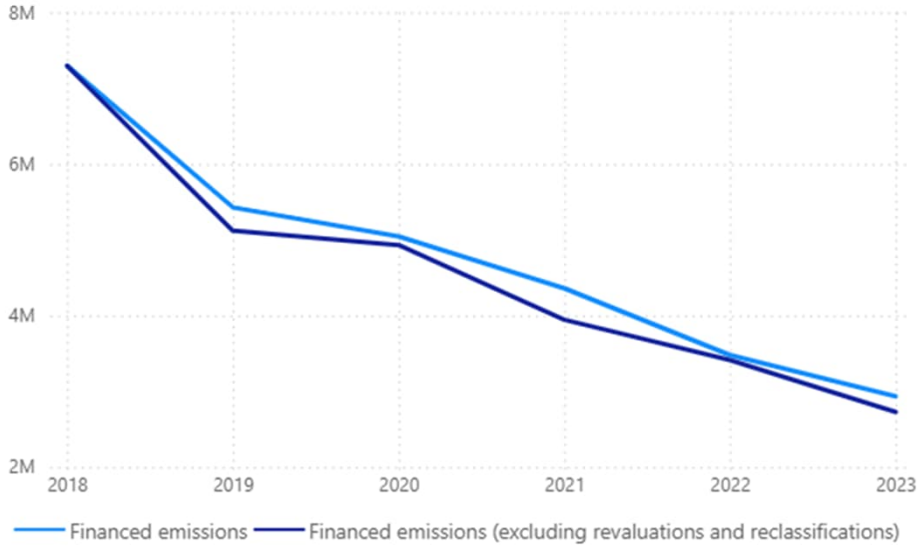


Source: NBB, ECB, ISS

Filtering out revaluation and reclassification effects reveals even stronger decline in financed emissions

Financial corporations: excluding revaluations and reclassifications



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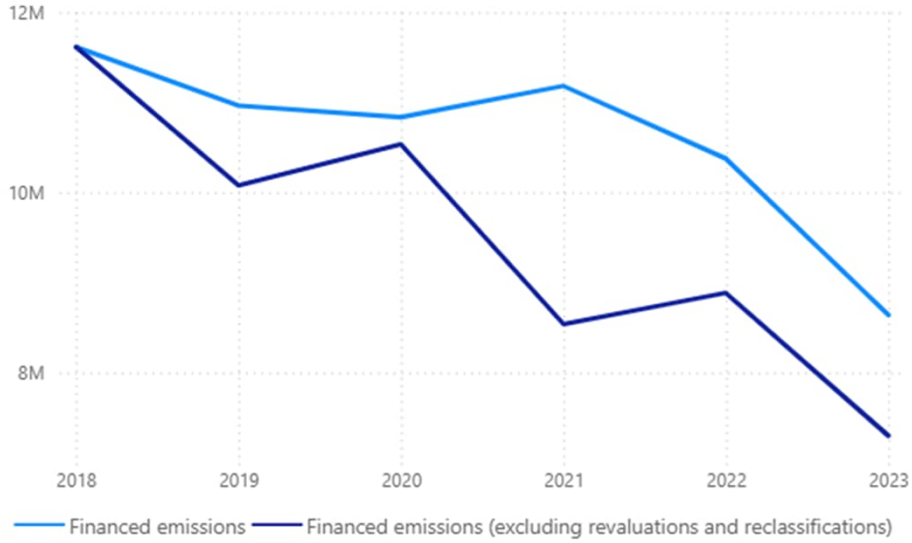
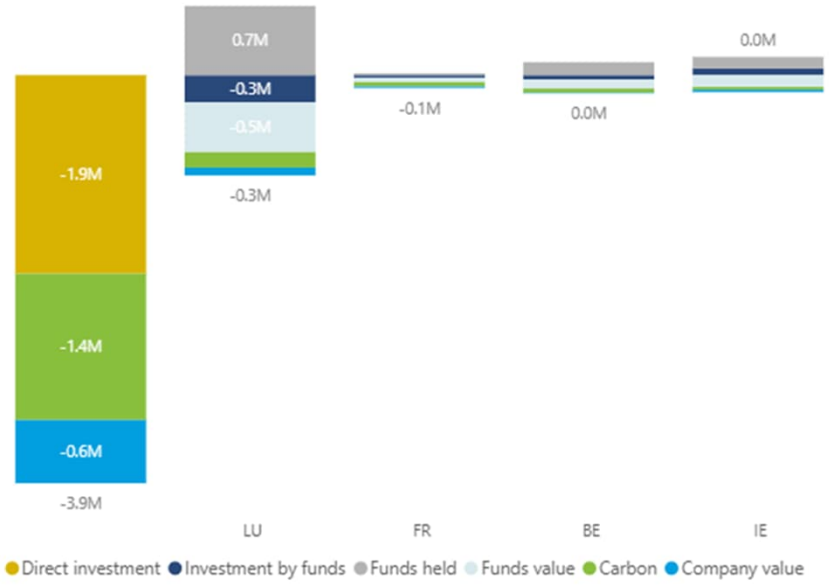


Source: NBB, ECB, ISS

The marshal and his tracker: precision in pursuit along the carbon trails of the great investment plains

Financial corporations: decomposition by fund country (2018-2023)



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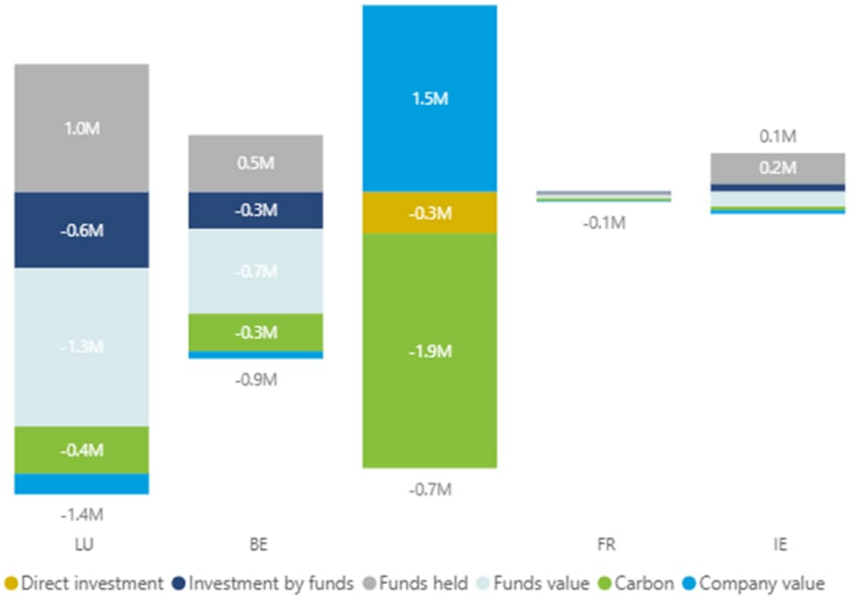

Source: NBB, ECB, ISS

CONCLUSIONS AND WAY FORWARD

The Marshall-Edgeworth decomposition provides a powerful framework for monitoring the carbon profile of investment portfolios

Way forward

1. Data improvements (e.g. holdings of individual (Belgian) funds rather than sectoral holdings)
2. Application to other carbon measures (e.g. weighted average carbon intensity)
3. Further deep-dives for data validation (e.g. assessing impact of data imputations) and storytelling