How could the ECB's monetary policy support the sustainable finance transition in the EU?

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FET Innovation Launchpad

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EC 2nd summer school on Sustainable Finance, 1.09.2020

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Overview

1. **Climate risk & financial stability**: climate as a new source of financial risk
   - Climate *physical and transition risks* channels to the economy and finance
   - Growing financial supervisors’ concern about climate risk and financial stability

2. **The missing dot: finance as a barriers to the low-carbon transition:** investors’ exposure to climate risks and mispricing
   - *Climate stress-test* of the financial system (Battiston ea. 2017), climate Value at Risk and *Climate Spread* (Battiston and Monasterolo 2019)

3. **The challenge:** classifying investments and portfolios’ exposure to climate risks
   - Insights from the Climate Policy Relevant Sectors and applications

4. **Towards a green ECB:**
   - To deliver on its mandate, ECB needs to assess portfolios’ exposure to climate risks, starting from its portfolio
   - Greening monetary policy: **sustainability filter** to complement asset purchase criteria?

Central banks and financial supervisors started to worry and act about the climate

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Mark Carney tells global banks they cannot ignore climate change dangers

Financial sector warned it risks losses from extreme weather and its stakes in polluting firms

Lagarde puts green policy top of agenda in ECB bond buying

President wants central bank to 'explore every avenue' in fight against climate change

Italy central bank to spurn firms that don't go green

The Bank of Italy plans to adopt investment criteria which reward companies that take action on climate change, joining other central bank...

reuters.com

Network for Greening the Financial System

First comprehensive report

A call for action

Climate change as a source of financial risk

April 2019

Climate change and financial stability: where does risk come from?

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- **2** channels of climate risk transmission to finance (Carney 2015, Batten ea 2016):
  - **Physical**: impact of extreme weather events on eco. activities:
    - Insurance, banks: losses on value of financial contracts owned and traded
    - Government: lower GDP growth ->lower fiscal revenues -> impact on eco. competitiveness, budget balance, creditworthiness
  - **Transition**: policy, tech., regulatory shocks:
    - Losses on carbon-intensive assets -> investors' portfolios -> cascading effect on their investors in the financial network
- These channels are connected (but treated separately so far) and can lead to **stranded assets**
- **Climate transition risk to happen sooner and be more financially relevant** than physical risk (NGSF 2019). But in developing country the opposite holds true

A disorderly transition can trigger systemic risk

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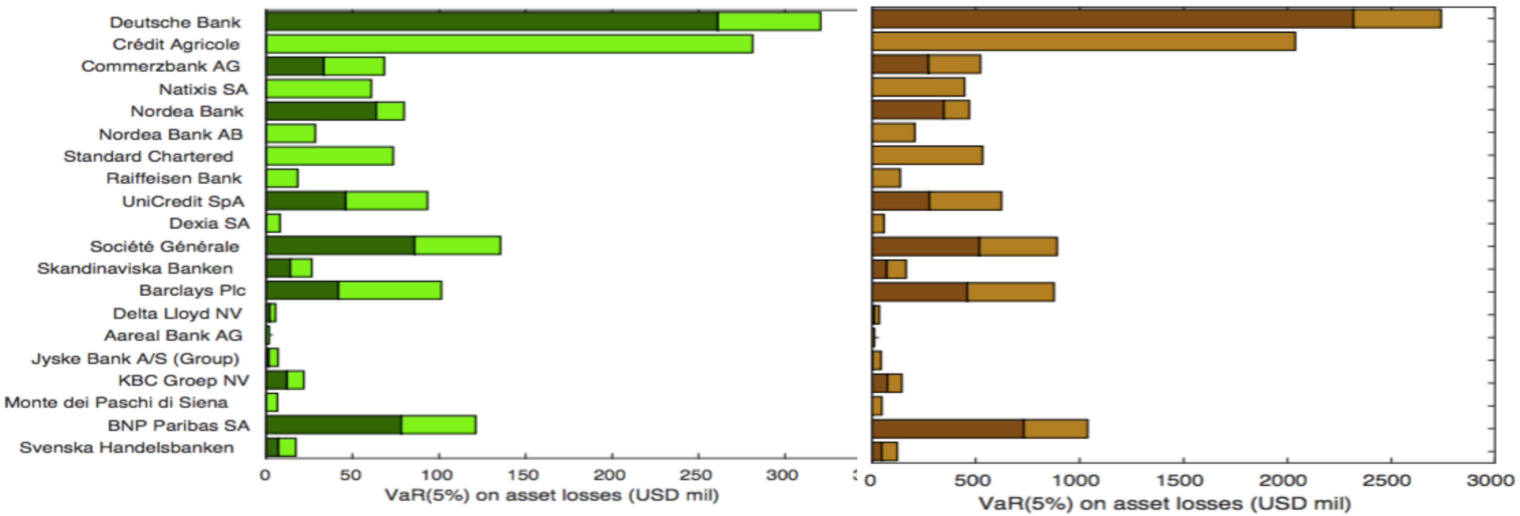
nature climate change

ARTICLES

PUBLISHED ONLINE: 27 MARCH 2017 | DOI: 10.1038/NCLIMATE3255

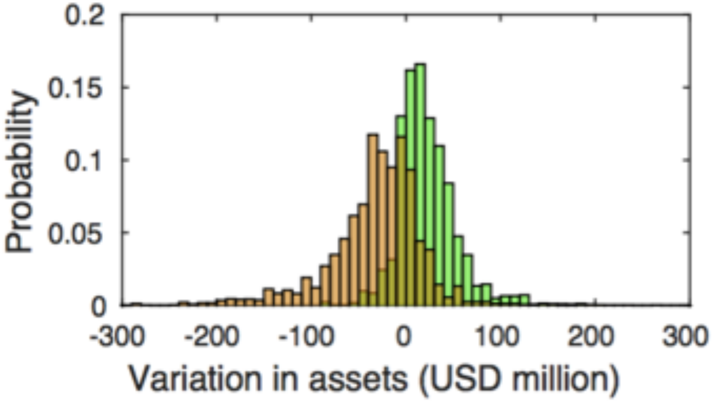
A climate stress-test of the financial system

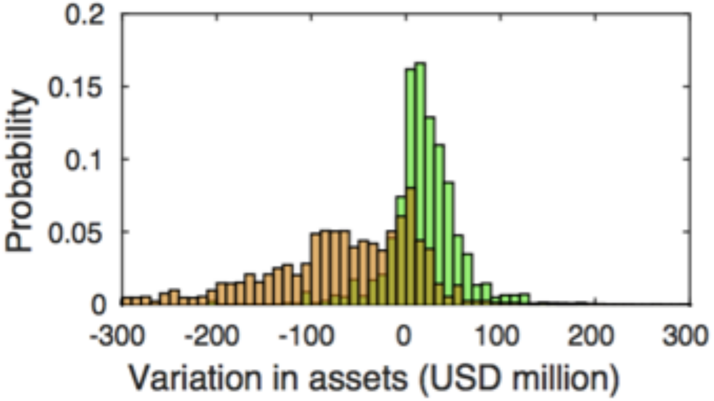
Stefano Battiston[1*], Antoine Mandel[2], Irene Monasterolo[3], Franziska Schütze[4] and Gabriele Visentin[1]



Value at Risk *(5% significance) on equity holdings of* ***20 most affected EU banks*** *under scenario of green (brown) investment strategy. Dark/light colors: first/second round losses.*

1st round (top): brown bank incurs more losses.
Adding 2nd round (bottom) polarizes distribution of losses.





How to analyze investors' exposure to climate transition risk?

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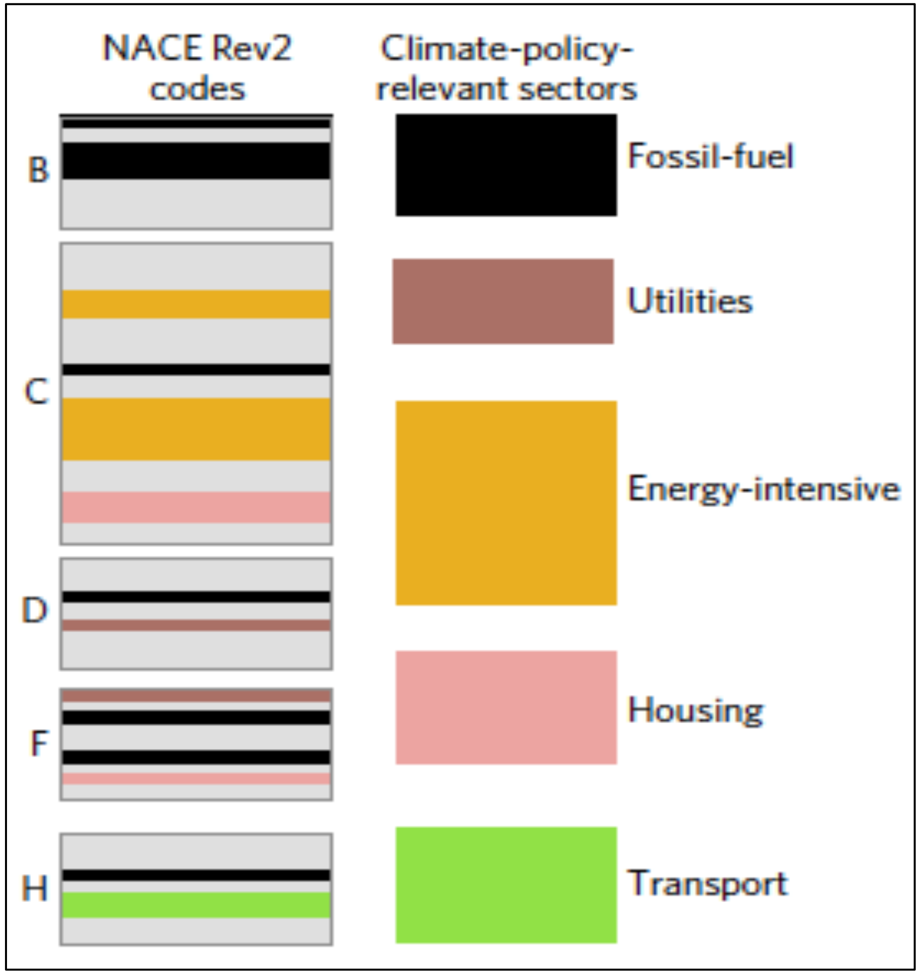
- NACE no good proxy of climate risk: no energy technology info nor financial risk dimension, classification issues (car companies classified as **financial** (PSE))

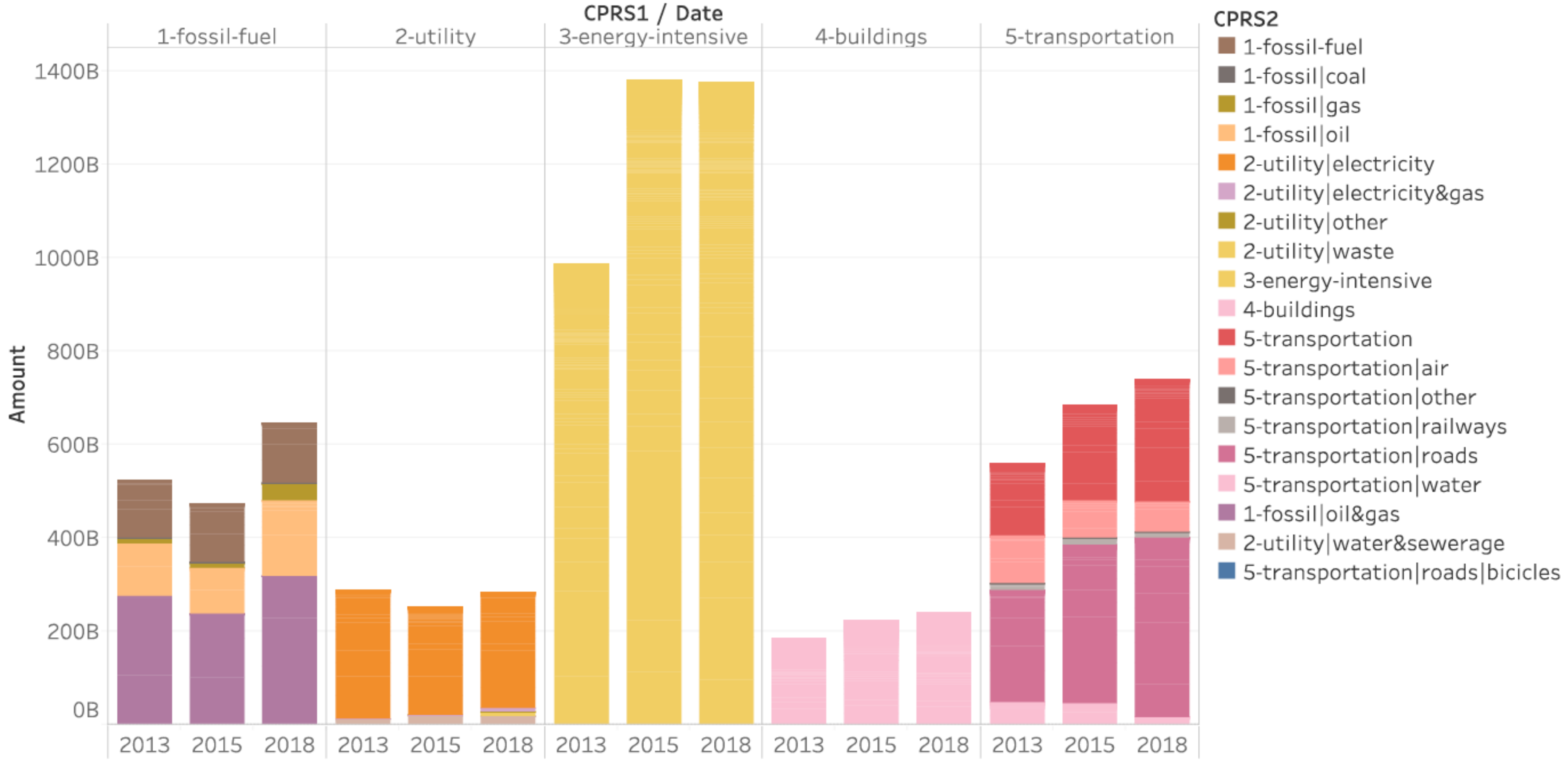
- Greenhouse Gas (**GHG**) emissions and Environmental Social Governance (**ESG)** ratings are NOT a proxy of climate risk (backward looking, no focus on technology, no transparency nor standardization -> "aggregate confusion" Berg ea. 2019, Cojoianu ea 2020)

- We developed **5 Climate Policy Relevant Sectors (CPRS)** classification
  - Fossil fuel, utilities, energy intensive, housing, transport



Battiston et al. (2017)

From CPRS rev.1 to CPRS rev.2: how much information you gain with higher granularity?



Detailed breakdown of financial investments in the European financial markets (CPRS level 1 and CPRS level 2) over time. Source: Alessi et al. (2019 -> financial impact assessment of the EU Taxonomy)

Rationale of financial contracts' classification into CPRS

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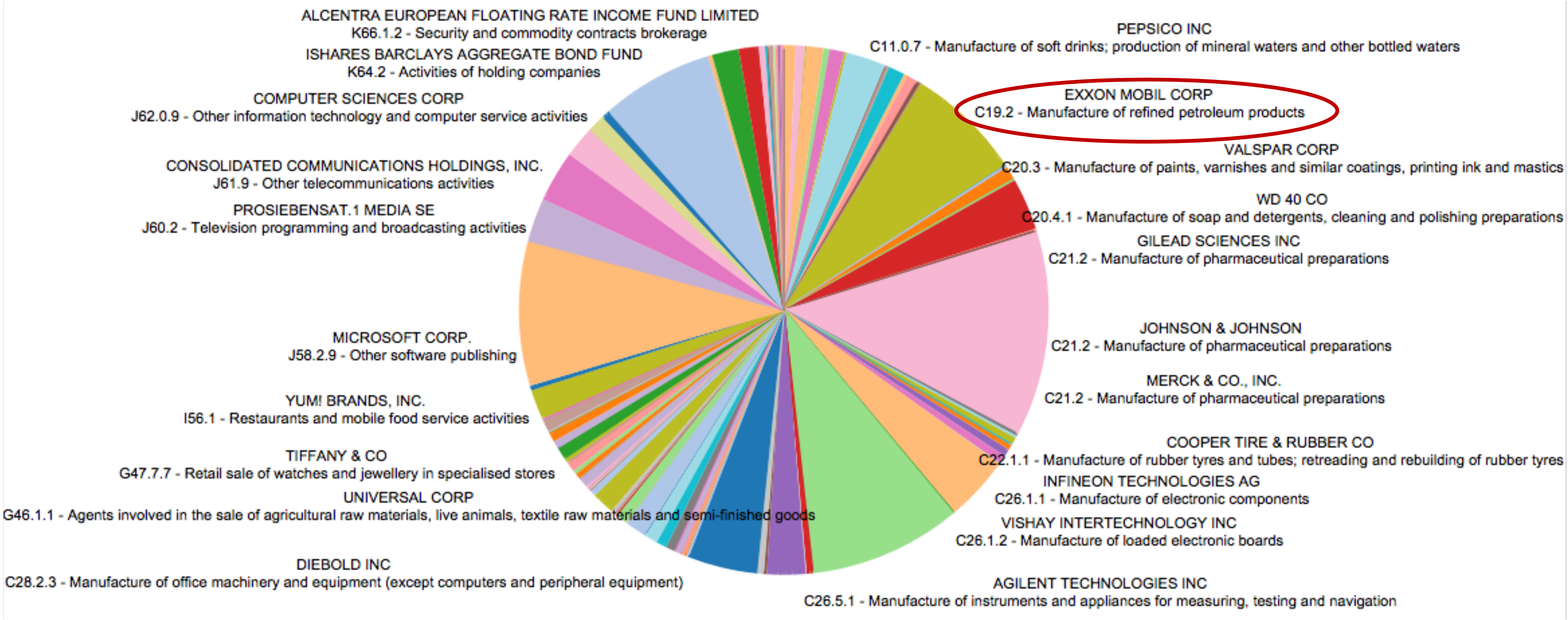
- CPRS classification is based on NACE economic sectors (4-digit) to assess investors' **exposure to climate risks and their relevance for climate change and policies** (Paris Agreement, EU2030, etc.)
- Simplest framework for transparent and policy relevant data classification: **3 main dimensions considered by CPRS**:
  - Contribution to Greenhouse Gases (GHG) **emissions** (info on Scope1,2,3, climate relevant data)
  - Role of the firm and sector in the **energy value chain** (e.g. mining and quarrying sector (B) has low direct emissions (3%) but high indirect/induced emissions in the value chain)
  - **Relevance for climate policy** and low-carbon transition (carbon leakage classification) and presence of traditional policy areas (e.g. Ministry of energy, transport…and lobby)

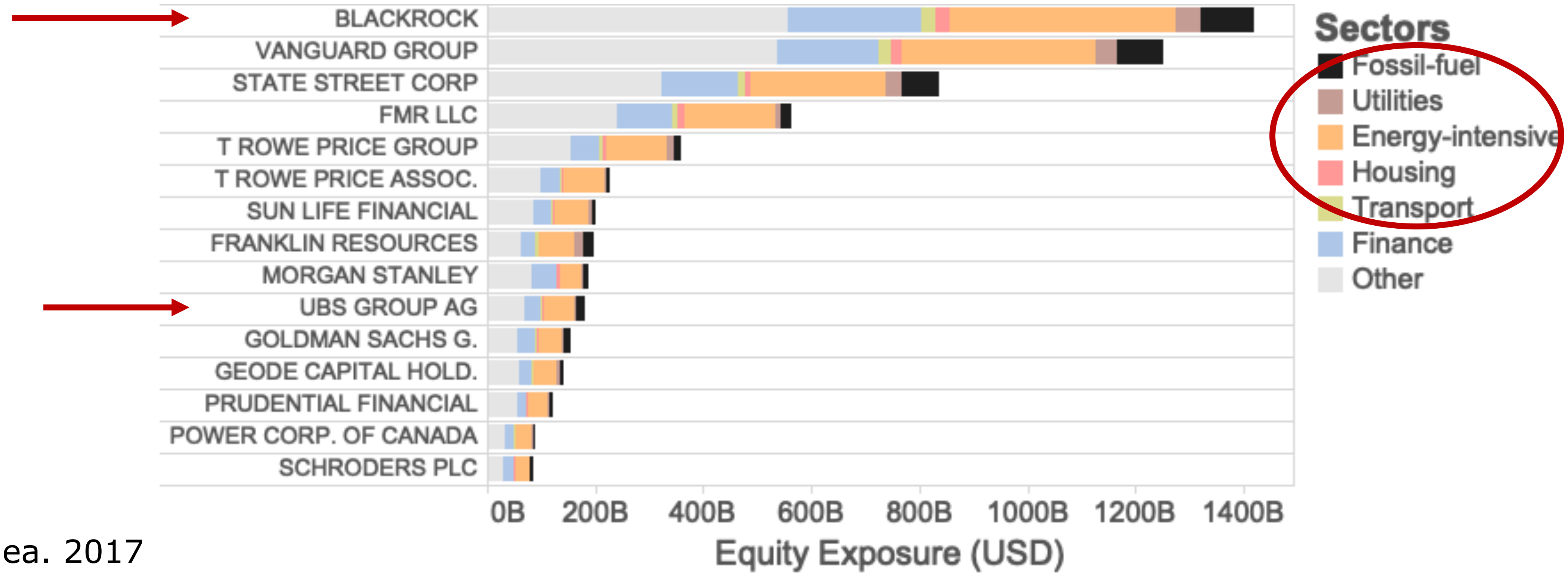
Source: Battiston ea. 2017

Example: snapshot of Blackrock's portfolio exposures to NACE 4 digit sectors



From NACE to portfolio’s classification into CPRS

- Investors’ exposure to CPRS is large and heterogeneous. CPRS represent important value of investment funds’ equity portfolios



Source: Battiston ea. 2017

From NACE to CPRS

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- **Different CPRS classification (e.g. fossil-fuel, energy intensive) for activities included in the same NACE (example: NACE B Mining and Quarrying)**

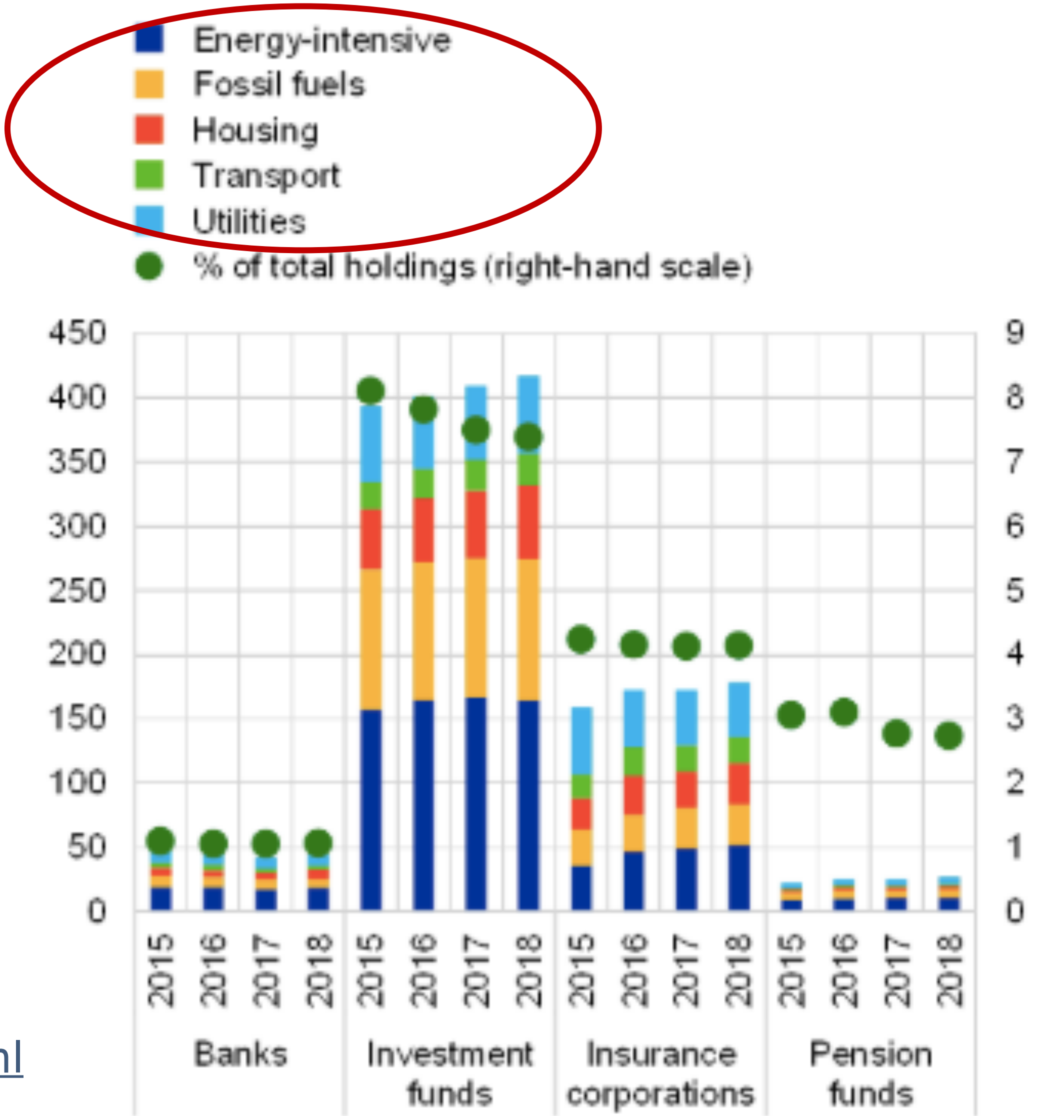
NACE	NACE1	NACE2	NACE3	Description	climate relevance:	Relevance to Climate action	CPRS1	CPRS2	CarbLeak
05.1	B-MINING AND QUARRYING	05-Mining of coal and lignite	05.1-Mining of hard coal	Mining of hard coal	H	Extraction of fossil fuels is main cause of dire	1-fossil-fuel	1-fossil|coal	
05.10	B-MINING AND QUARRYING	05-Mining of coal and lignite	05.1-Mining of hard coal	Mining of hard coal	H	Extraction of fossil fuels is main cause of dire	1-fossil-fuel	1-fossil|coal	C
08.9	B-MINING AND QUARRYING	08-Other mining and quarryin	08.9-Mining and quarrying n.e.c.	Mining and quarrying n.e.c.	H	This sector does not share business model of	3-energy-intensi	3-energy-intensive	
08.91	B-MINING AND QUARRYING	08-Other mining and quarryin	08.9-Mining and quarrying n.e.c.	Mining of chemical and fertiliser minerals	H	This sector does not share business model of	3-energy-intensiv	3-energy-intensive	C
08.92	B-MINING AND QUARRYING	08-Other mining and quarryin	08.9-Mining and quarrying n.e.c.	Extraction of peat	H	Extraction of fossil fuels is main cause of dire	1-fossil-fuel	1-fossil|coal	
08.93	B-MINING AND QUARRYING	08-Other mining and quarryin	08.9-Mining and quarrying n.e.c.	Extraction of salt	H	This sector does not share business model of	3-energy-intensiv	3-energy-intensive	A
08.99	B-MINING AND QUARRYING	08-Other mining and quarryin	08.9-Mining and quarrying n.e.c.	Other mining and quarrying n.e.c.	H	This sector does not share business model of	3-energy-intensi	3-energy-intensive	A,C

- **Need for reclassification**

A	B	C	R	S	T	U	V	W	X	Y
ISIN	**Issuer**	**LEI**	**NACEClassification**	**IssuerConsolida**	**Parent**	**NACEDescr**	**NACEC**	**SectorCPRS2**		
XS158655551	VOLKSWAGEN INTERNATIONAL FINANCE NV	52990(	Trusts, funds and similar financial entities (NACE) (64.30)	Volkswagen AG	FAMILIEN PORSCHE	Manufacture of motor vehicles	29.10	carbon-intensive transportation		
XS158655560	VOLKSWAGEN INTERNATIONAL FINANCE NV	52990(	Trusts, funds and similar financial entities (NACE) (64.30)	Volkswagen AG	FAMILIEN PORSCHE	Manufacture of motor vehicles	29.10	carbon-intensive transportation		
XS158655586	VOLKSWAGEN INTERNATIONAL FINANCE NV	52990(	Trusts, funds and similar financial entities (NACE) (64.30)	Volkswagen AG	FAMILIEN PORSCHE	Manufacture of motor vehicles	29.10	carbon-intensive transportation		
XS158655594	VOLKSWAGEN INTERNATIONAL FINANCE NV	52990(	Trusts, funds and similar financial entities (NACE) (64.30)	Volkswagen AG	FAMILIEN PORSCHE	Manufacture of motor vehicles	29.10	carbon-intensive transportation		
XS158980690	HEIDELBERGCEMENT FINANCE LUXEMBOURG	52990(	Trusts, funds and similar financial entities (NACE) (64.30)	HeidelbergCeme	HeidelbergCement A	Manufacture of cement	23.51	energy-intensive		
XS158988127	BMW FINANCE NV	52990(	Trusts, funds and similar financial entities (NACE) (64.30)	BMW AG	BMW AG	Manufacture of motor vehicles	29.10	carbon-intensive transportation		
XS158988178	BMW FINANCE NV	52990(	Trusts, funds and similar financial entities (NACE) (64.30)	BMW AG	BMW AG	Manufacture of motor vehicles	29.10	carbon-intensive transportation		
XS159056813	NATURGY CAPITAL MARKETS SA	95980(	Trusts, funds and similar financial entities (NACE) (64.30)	Naturgy Energy	Naturgy Energy Gro	Manufacture of refined petrole	19.20	fossil-fuel		
XS159673936	MADRILENA RED DE GAS FINANCE BV	72450(	Trusts, funds and similar financial entities (NACE) (64.30)	Madrilena Red I	ELISANDRA SPAIN IV	Distribution of gaseous fuels th	35.22	fossil-fuel		

ECB's climate financial risk analysis of the Euro Area market

- **European Central Bank** (2019)'s **"Climate change and financial stability"** (in Financial Stability Review (May 2019):
  - Euro area financial institutions' exposures to transition risk based on CPRS classification by Battiston et al. 2017
- Recent application to Austrian banking sector in collaboration with OeNB (Battiston ea 2020 forth FSR)



https://www.ecb.europa.eu/pub/financial-stability/fsr/special/html/ecb.fsrart201905_1~47cf778cc1.en.html

But what about ECB’s monetary policy?

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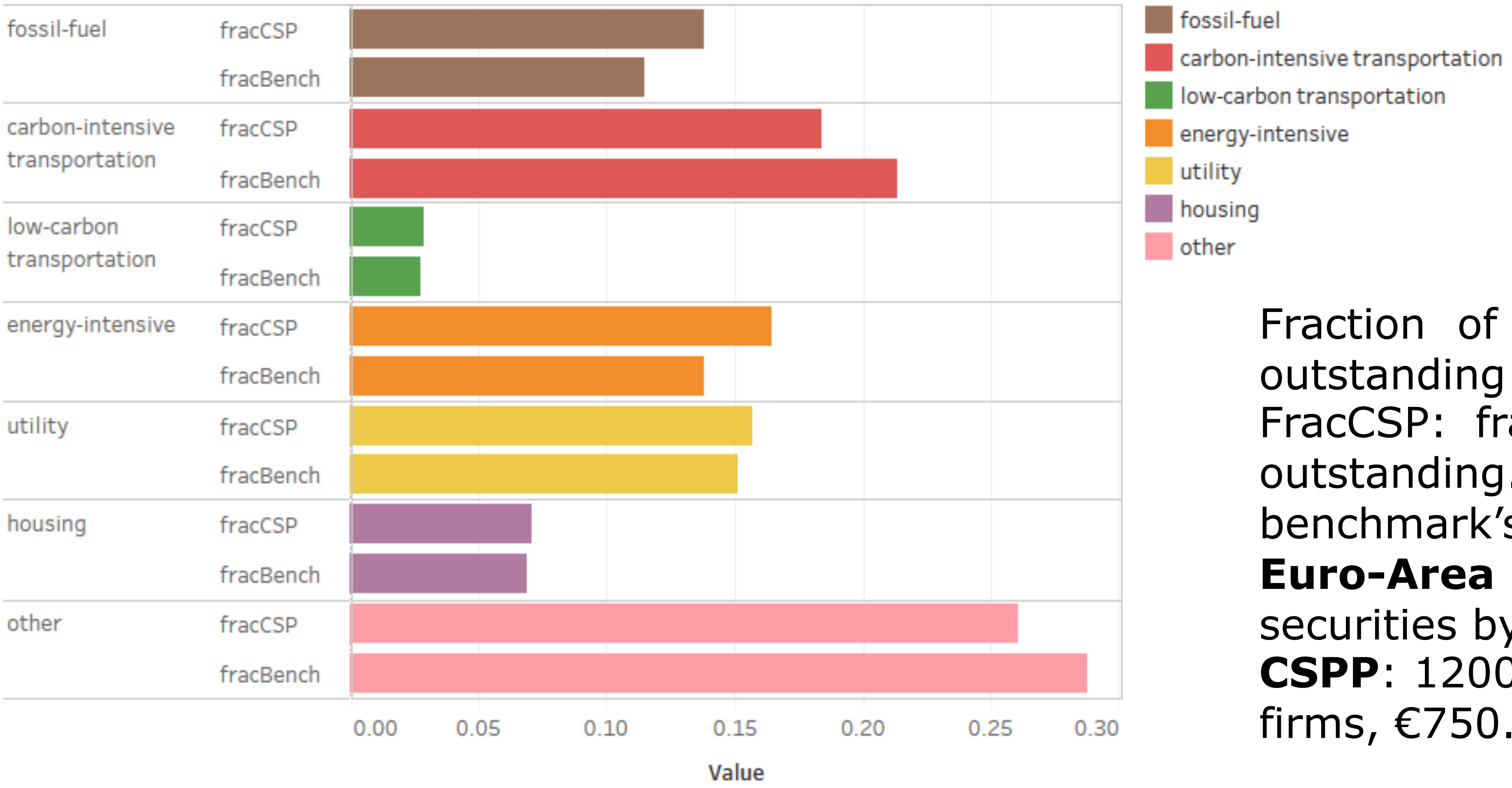
- March 2015: ECB’s Quantitative Easing (QE, *whatever it takes*): 2.8 trn EUR injected in Euro Area
- Lagarde has opened the door to using €2.8tn asset purchase scheme to pursue green objectives “**because at the end of the day, money talks**”
- ECB replaces the bonds that reach their maturity with other eligible bonds. Thus, **CSPP composition concerns not only the past but also the future**
- COVID-19 crisis: ECB has expanded asset purchase programme of private and public sector securities (Pandemic Emergency Purchase Program, **PEPP**) to € 1.35 trillion until at least June 2021
- Thus, understanding ECB’s asset purchase contribution to climate action (e.g. via direct/indirect signaling) and exposure to climate risks is crucial

Description of the analysis

- Debate on sector composition of ECB's QE Corporate Sector Purchase Program (CSPP) implemented by 6 National Central Banks (NCBs): CSPP biased towards high carbon sectors (Matikainen ea 2017, Schonmaker 2019).
- However, they did not develop a benchmark to compare CSPP sectors' composition. But important (market neutrality claim of purchases)
- We develop a benchmark of the Euro Area corporate bonds' market that complies with the CSPP's eligibility criteria set by the ECB (issued by non-bank institutions in EA, investment grade and <30y maturity)
  - 1557 securities issued by 282 firms,
  - CSPP universe composed of 1097 securities issued by 237 firms.
- We compare the exposures to CPRS of the benchmark, the CSPP and the individual NCB's purchases, at the level of individual issuance and issuer

Source: Battiston, S. and Monasterolo, I. (2019).

ECB shopping bag: CSPP's CPRS composition vs corp. bonds market benchmark



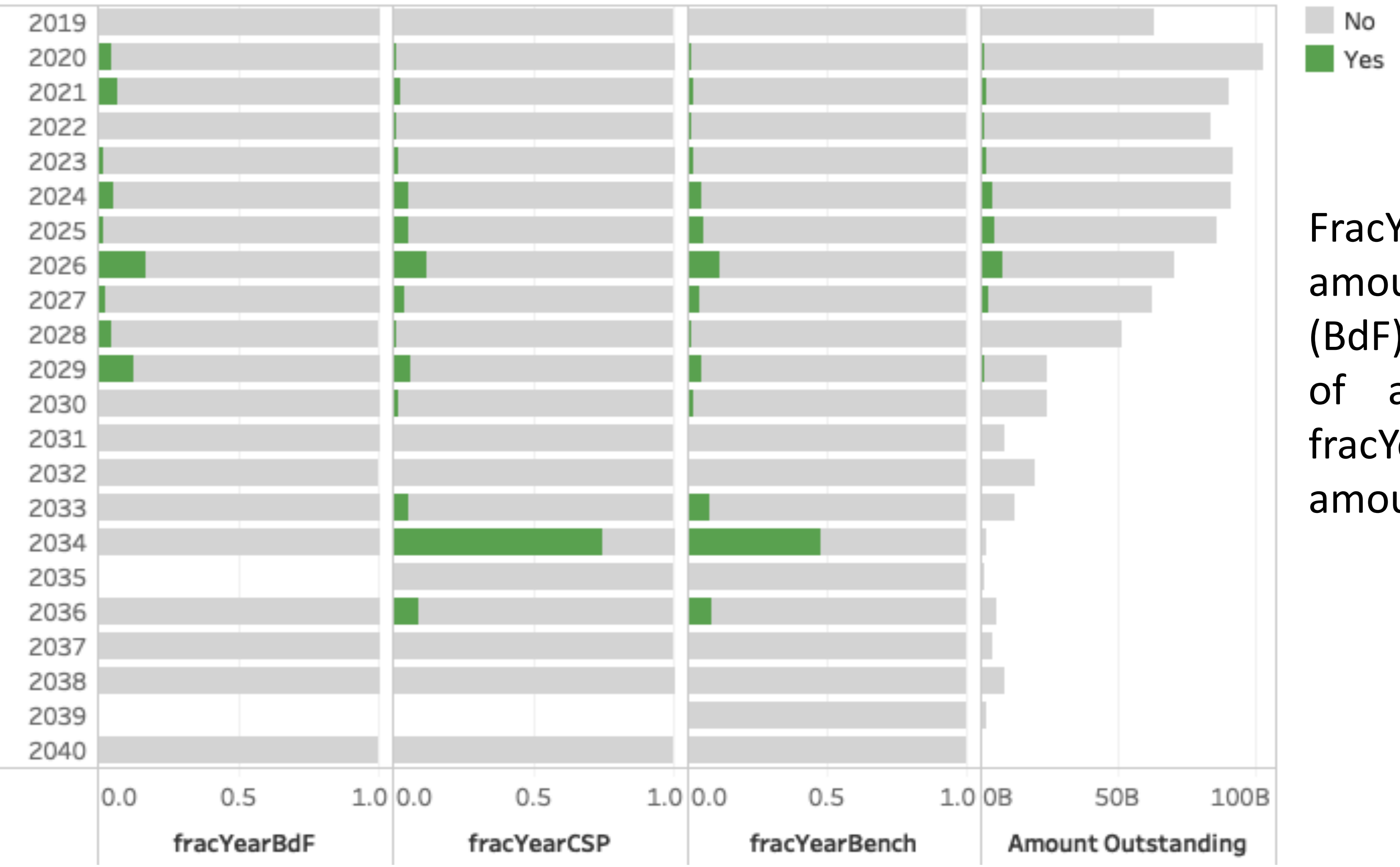
Fraction of bonds on total amount outstanding (e.g. 0.2 equals 20%). FracCSP: fraction of CSPP's amount outstanding. FracBench: fraction of benchmark's amount outstanding

Euro-Area benchmark: 1.557 securities by 282 firms, €809.859 bn

CSPP: 1200 securities by 237 firms, €750.278 bn.

Source: Battiston, S. and Monasterolo, I. (2019). *How could the ECB's monetary policy support the sustainable finance transition?* (input to Positive Money and Veblen's report Aligning Aligning Monetary Policy with the EU's Climate Targets) https://www.finexus.uzh.ch/en/news/cspp_sustainable_finance.html

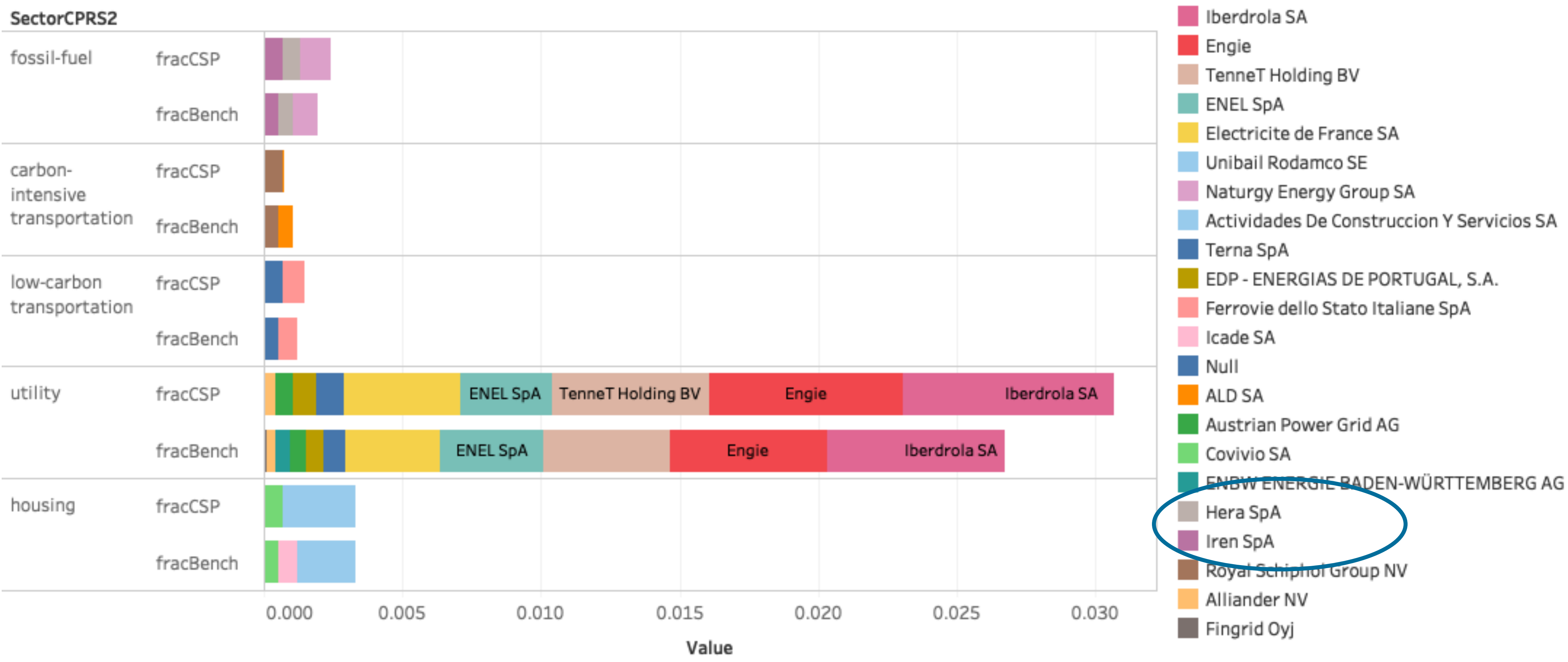
ECB's CSPP timid shades of green



FracYearBdF represents the fraction of amount outstanding of Banque de France (BdF), fracYearCSP represents the fraction of amount outstanding of the CSPP, fracYearBench represents the fraction of amount outstanding of the benchmark.

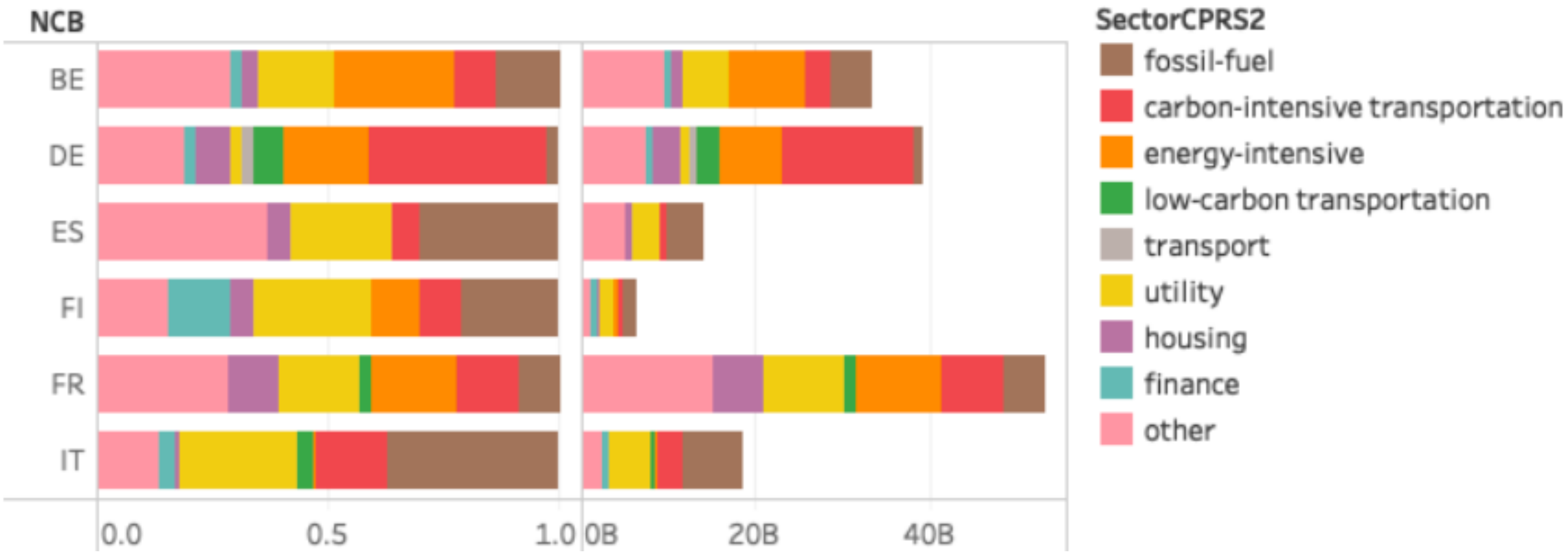
Source: Battiston and Monasterolo (2019).

Who issued the CSPP green bonds? Several brown companies (-> issues for greenwashing)



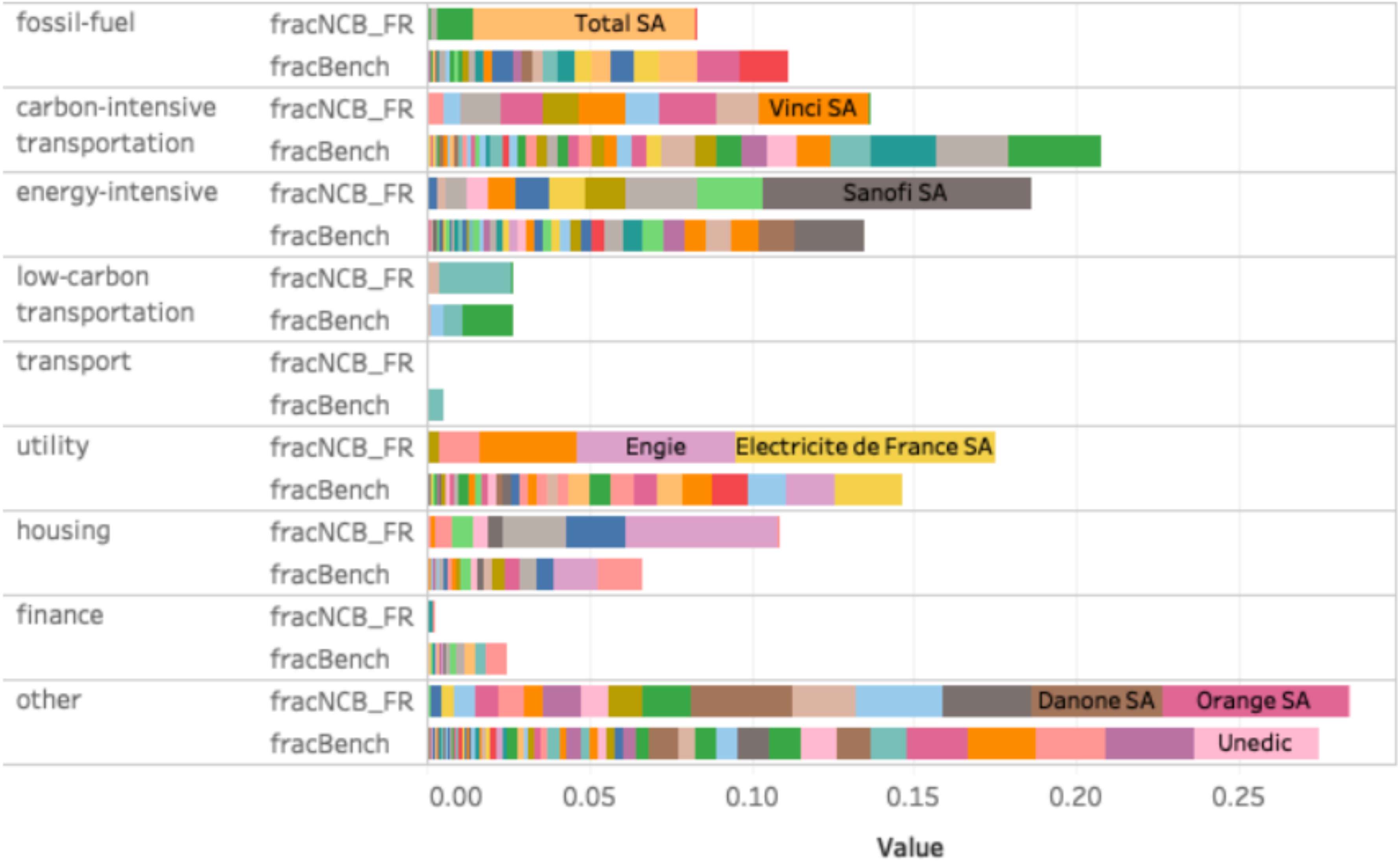
Source: Battiston and Monasterolo (2019).

Shades of brown: heterogeneous climate risk exposure and drivers by national central banks



Composition of the six individual NCBs' CSPP portfolio by CPRS as a share of the total bonds' amount outstanding (0.5 =50%, left) and in value of amount outstanding in bn Eur (right).
Relevance of the value of **Banque de France (FR)** portfolio on overall CSPP.
Bundesbank (DE): largest relative exposure to carbon-intensive transportation. **Banca d'Italia (IT)**: largest relative exposure to fossil-fuel firms.
Source: Battiston and Monasterolo 2019.

Diggin in: what has Banque de France purchased?



Banque de France (BdF) has the largest CSPP value (amount outstanding since data on value of purchases not disclosed).
Fraction of bonds by CRS and individual bonds' issuer out of the total amount outstanding (e.g. 0.2 equals 20%).
FracNCB_FR: fraction of amount outstanding purchased by BdF, while fracYearBench: fraction of amount outstanding of the benchmark.

Source: Battiston and Monasterolo (2019).

Results

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- **CSPP closely follows the market benchmark**, which is mostly composed of issuances from fossil fuel and carbon-intensive firms, and associated to long-term maturities.
- In contrast, **green bonds' share is still residual**
- Further, green bonds being issued also by carbon-intensive companies -> challenges for **greenwashing**? (our analysis pre-Taxonomy)
- The exposure to CPRS very **heterogeneous** across NCBs, and follows national **economy composition**:
  - Banca d'Italia: fossil fuel firms
  - Bundesbank: automotive companies

Lessons learned and recommendations

- To effectively support the EU sustainable finance and Green Deal agenda without prejudice on its market neutrality, ECB could introduce :
  - Weight for carbon-intensive companies that are Taxonomy aligned
  - Introduce sustainability filter -> challenges for ESG (standardization, etc)
  - Collaborate with national statistical offices for the creation of standardized data repository at sector/firm level (e.g. energy price on revenues)
- This would contribute to:
  - Decarbonize ECB portfolio and EU economy
  - Strengthen market signaling (let the money talk)
  - Operationalize EU Taxonomy and low carbon benchmarks in monetary policy
  - Inform the introduction of sustainability considerations in prudential regulation (Basel III)
  - Leverage on complementarities for financing the Green Deal (e.g. with EIB)
- Elephant in the room: lack of standardized ESG ratings, greenwashing

The importance of assessing climate financial risk exposure of ECB's portfolio

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- **Market signaling**: affect investors' expectations (climate sentiments, Dunz ea 2020) -> potential impact on prices
- Contribution to implementation of European Green Deal: **3 Cs**
  - Policy **coherence**: coordination of green fiscal, monetary and prudential (sustainability supporting factor/brown penalizing factors)
  - Policy **complementarity**: to support EIB's (e.g. green and sustainability awareness bonds' financing in the Green Deal implementation)
  - Policy **conditionality**: e.g. asset purchase with minimum decarbonization targets

➢ Assess ECB's portfolio exposure to climate risks (and its Taxonomy alignment) is crucial to inform greening monetary and prudential policy and its role in Network for Greening the Financial System (NGFS)

Our stream of literature and institutional collaborations on climate financial risk assessment

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1. Battiston S., Mandel A, Monasterolo I., Schuetze F. & G. Visentin **(2017). A Climate stress-test of the EU financial system**. *Nature Climate Change*, 7, 283–288.

2. Monasterolo, I., ea. (2017). Vulnerable yet relevant: the two dimensions of climate-related financial disclosure. *Climatic Change*, *145*(3-4), 495-507.

3. Monasterolo, I., ea. (2018). A carbon risk assessment of China's overseas energy portfolios. *China & World Economy 26*(6), 116–142. **G20 Task Force "An International Financial Architecture for Stability and Development".**

4. Battiston S., Mandel A., Monasterolo I. (2019). **CLIMAFIN handbook**: pricing forward-looking climate risks under uncertainty. Available at SSRN.

5. Battiston, S. and Monasterolo, I. (2019). A climate risk assessment of sovereign bonds' portfolio. Working paper forthcoming as OeNB financial stability report.

6. Battiston, S., ea. 2019. Climate risk assessment of the sovereign bond portfolio of European insurers. **EIOPA Financial Stability Report**, pp. 69-89

7. Monasterolo, I., de Angelis, L. (2020). **Blind to carbon risk?** An analysis of stock market's reaction to the Paris Agreement. *Ecological Economics*, 170, 1-10

CPSR are complementary to the taxonomy

- EC taxonomy aims to identify economic activities that positively contribute to climate mitigation, adaptation, do not do harm
  - **More restrictive than CPRS (threshold by activity)**
- **CPRS and taxonomy depart from NACE** framework and complements it
  - Climate risk dimension
  - Financial risk and policy relevance dimensions
  - Allows (if info available) downstreaming to firm level
  - E.g.: activities in value chain of transportation sector are classified by NACE codes under C-Manufacturing. Regrouping them by CPRS allows analyse the contribution and relevance to climate mitigation or adaptation
- **Challenge**: assigning the right (business point of view) NACE 4-digit level for individual issuer requires sector-specific knowledge of the business model in particular for climate relevant activities (e.g. car manufacturing, gas transmission, railways, utility,..)