Methodological note - A global database for climate-related financial policies

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Method description

This section presents the conceptual framework and methodology used to construct the database. The method consists of three phases, as summarized in Figure 1 and described in the rest of the section.

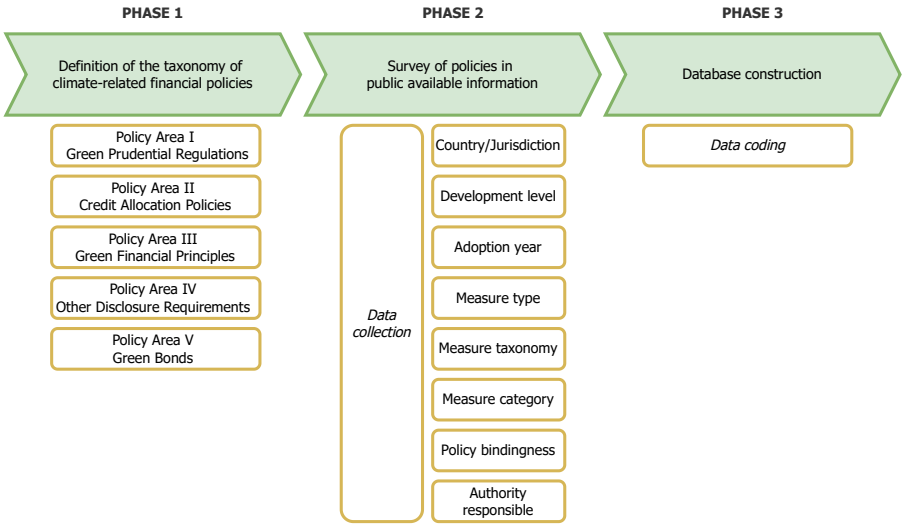

Figure 1.: The conceptual framework for developing the global database for climate-related financial policies. Source: author elaboration

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Taxonomy and coverage of policies

The database includes five types of climate-related financial policies[1]. They are grouped into five "Policy Areas" and defined as follows. Objectives and instruments characterizing each Policy Area are also summarized in Figure 2.

Financial Policy Area		Category		Objective	Instrument	Example
POLICY AREA I (GPP)	**Green Prudential Regulations**: to promote the development of green macroprudential frameworks	*Capital*	*Quality and level of capital*	Mitigate and prevent excessive credit growth and leverage	CAR with GSF/BPF CCyB Sectoral Leverage Ratios Sectoral Capital Requirements	
			Risk management and supervision	Evaluate effect of economic or financial shocks to the financial system	Climate-related stress test (macro)	**UK**, 2019, General Insurance Stress Tests (GIST) Cover Natural Catastrophe Scenarios and Climate Change Risks (Largest banks and insurers), Prudential Regulatory Authority
				Assess exposure of of banks' portfolios to carbon-intensive assets	Green Asset Ratio	
				Internal Process of Capital Adequacy Assessment: Include social and environmental risks when assessing their capital needs	ICAAP	**Brazil**, 2011, Circular No. 3,547/2011, Banco Central do Brazil
			Enhanced risk disclosure and market discipline	Inform about concentration of carbon-intensive assets in the financial sector	Climate-related disclosure requirements	**China**, 2013, China's Green Credit Statistics System, China Banking Regulatory Commission (CBRC)
		Liquidity	*Liquidity*	Mitigate and prevent market illiquidity and maturity mismatch	LCR NSFR	
		Large exposures	*Lending limits*	Mitigate systemic risk by limiting the concentration of certain exposures	Large exposures limit	
POLICY AREA II (GCA)	**Green Credit Allocation Policies:** to directly promote green credit measures and investments					**India**, 2015, Priority Sector Lending, Reserve Bank of India
POLICY AREA III (GFP)	**Green Financial Principles**: to create green financial markets					**Australia**, 2015, Environmental, Social, and Governance (ESG) Reporting Guide, Financial Services Council
POLICY AREA IV (OGD)	**Other disclosure requirements**: to promote the public disclosure of climate risks (also for non-financial institutions)					**France**, 2001, New economic regulations Act requires publicly traded companies to disclose environmental information, Government
POLICY AREA V (GB)	**Green bonds taxonomy and issuing**: to promote the development of green financial securties					**Indonesia**, 2017, Regulation on the Issuance and the Terms of Green Bond (No. 60/POJK.04/2017), Financial Services Authority of Indonesia (OJK)

Figure 2.: Definition of the five Policy Areas, instruments and objectives of the climate-related policy measures. Source: author's elaboration

Policy Area (I) - *Green Prudential Regulations* (GPP) Policies contained in this Policy Area (PA) aim to identify threats to - and safeguard - financial stability in the presence of climate-related financial risks. PA-I is characterized by capital regulations[2], governance and risk management measures, climate-related stress tests (CRSTs), and climate-related risk disclosure *aimed at the banking sector*.

For jointly tackling climate risks and promoting green finance, capital requirements that consider climate risk may be necessary for Pillar I actions. The rationale of these policies is to reduce a bank's exposure to carbon-intensive assets and, depending on the

[1]We build on the definition of financial policies as identified by IMF (2000): "the term [f]inancial policies refers to policies related to the regulation, supervision, and oversight of the financial and payment systems, including markets and institutions, with the view to promoting financial stability, market efficiency, and client-asset and consumer protection". To define climate-related financial policies, we rely primarily on existing literature that has contributed to creating a taxonomy of what we define as climate-related financial policies in the past few years (see,e.g., Krogstrup and Oman 2019; D'Orazio and Popoyan 2019).

[2]The classification used to identify capital prudential regulations follows the Basel III classification framework (BCBS 2011; BCBS 2017). The Basel III framework was developed by the Basel Committee on Banking Supervision after the Great Financial Crisis and referred to banking regulation agreements related to capital, market, and operational risks. It comprises three Pillars: capital regulations, liquidity regulations, risk disclosure, and market discipline.

instrument, shift financial flows toward green ones by increasing risk weights or adding capital buffers for polluting sectors. Large exposure limits tied to the climate may serve to limit systemic hazards resulting from climate threats, and liquidity regulations can be implemented to address severe funding and market liquidity shortages.

The Internal Capital Adequacy Assessment (ICAAP) and climate-related stress tests are two additional measures. They are related to "Pillar 2 - Risk Management and Supervision," which aims to evaluate the financial system's resilience to adverse climate shocks by taking into account the potential effects of climate-related shock scenarios on the stability of individual financial institutions and the financial system as a whole. They provide useful information to policymakers regarding the financial system exposure to climate-related risks and their results could be used to calibrate and evaluate green macroprudential tools.

Other prudential measures are defined under Pillar III, such as *disclosure requirements* of the physical, liability, and transition risks associated with climate change. They are relevant to developing a credible green financial system and avoiding the so-called "greenwashing" (TCFD 2018).

Policy Area (II) - *Green Credit Allocation Policies* (GCA) This PA includes policies promoting green lending and investments through credit allocation and/or lending limits. Credit allocation instruments are, for example, green lending quotas and concessional loans to priority and environmentally friendly sectors.

Policy Area (III) - *Green Financial Guidelines* (GFG) It is characterized by policies aimed at "creating green financial markets," such as green finance principles and taxonomies. Sustainability reporting and compliance practices are increasingly complementary to risk management practices in dealing with concerns about the adverse consequences of climate change (Ng 2018).

Policy Area (IV) - *Other Green Disclosure Requirements* (OGD) PA-IV is concerned with reporting regulations and environmental, social, and governance (ESG) criteria aimed at pension funds, insurance companies, and other non-financial institutions (Della Croce et al. 2011; Boermans and Galema 2019; Krueger et al. 2020).

Policy Area (V) - *Green Bonds Taxonomy and Issuing* (GB) Regarding green bonds covered in the Policy Area (V), they are "any type of bond instrument where the proceeds will be exclusively applied to finance or re-finance, in part or in full, new or/and existing eligible green projects" (ICMA 2018). The green bond[3] market is gaining momentum as a viable financial option for climate change mitigation (Chen and Zhao 2021; Braga et al. 2021). According to Climate Bond Initiative, green bonds have gained popularity, with more than 290 billion dollars issued in 2020 and 1.1 trillion dollars in outstanding bonds (CBI 2020, 2021). Corporations issued the highest volumes, financial institutions, and government-backed organizations (e.g., real estate, retail, manufacturing, and energy utilities), with proceeds predominantly toward GHG reduction in energy, buildings, and transportation projects. Green bonds have drawn much attention in the past decade from academics and policymakers, and they are gaining a key role in funding projects that contribute to environmental sustainability (Ng 2018; Gianfrate and Peri 2019; Tolliver et al. 2019; Maltais and Nykvist 2020).

Data collection

Official documents by central banks, financial supervisory authorities, governments, and banking associations have been scrutinized by relying on the publicly available information from 2000 to **2020**. Data is collected for **74** countries , for which relevant information of the identified five policy areas presented above has been reported and publicly disclosed.

The search terms used to gather information are keywords related to green finance, the banking industry, and financial regulation. The keyword used are as follows: 'finance', 'financing', 'loan', 'credit', 'investment', 'banking', 'bank', 'financial institutions', 'banking sector', 'financial regulation', 'financial policies', 'promotional credit', 'prudential', 'financial principles'. These keywords were combined with adjectives such as 'green,' 'sustainable,' 'climate-related,' 'environmental,' and 'sustainable' to restrict the search to the policies related to climate risks and low-carbon transition.

Information on the policy *bindingness* has also been collected when reviewing the text of the surveyed policies and used to assess each policy's strength in the jurisdictions (i.e., mandatory, voluntary, or not binding).

[3]Green bonds are frequently referred to as climate bonds because they concentrate on GHG mitigation; however, the prevalent market nomenclature is "green".

Additionally, data on the organization responsible for the policy's formulation or promotion has been collected; based on the available information, we distinguished between central banks, financial regulators, and government or non-governmental entities.

Data coding scheme

The taxonomy of policies described in Section was used to classify the policies into one of the five categories. After checking the information,it was integrated into the database to create a panel containing the information on which policy each country had implemented and the accompanying year.

Information on the policy *bindingness* is coded as follows: a value of 1 is assigned when there is no information on the bindingness or the policy is not binding; 2 when the policy's adoption is voluntary; and 3 when it is mandatory. The codification choice of the bindingness feature along discrete values instead of considering it a binary variable) follows existing literature (see, e.g., Steurer 2013; Hooghe et al. 2017; Schnabel 2017; Zürn et al. 2021) and allows us to take into account the richness of information we collected in the review of policies.

It has been recorded which policy has been adopted and the corresponding year for each country, creating a panel database comprising 7770 country-year observations (five policy areas for 74 countries over 21 years are considered). Moreover, information on the policy bindingness and assess each policy's strength in the jurisdictions has been collected. This information is coded as follows: we assign a value of 1 when there is no information on the bindingness, or the policy is not binding; 2 when the policy's adoption is voluntary; and 3 when it is mandatory.

Data Records

The database includes 74 countries as reported in Table 1, of which 39 are advanced economies, 20 are emerging economies, and 15 are developing economies, and covers the period from 2000 to 2020.

The dataset contains the following fields:

- **ID**: Unique identifier for each individually implemented measure.

- **Country**: The Country where the measure was implemented.
- **ISO3**: Three-letter country code published by the International Organization for Standardization.
- **GEO**: geographical location according to the World Bank classification.
- **DEV**: Development stage according to the World Bank classification.
    - high-income countries: HIC,
    - upper-middle income countries: UMIC,
    - lower-middle-income countries: UMIC,
    - low-income countries: LIC.
- **YEAR**: Year of adoption of the policy.
- **CAT1**: Type of instrument: for each category, single instruments have been recorded.
- **CAT2**: Taxonomy according to the five Policy Areas.
- **DESCR**: Describes the measure found in the text data source, translated into English.
- **AUTH**: Identifies the institution responsible for the promotion/implementation of the policy, as mentioned in the document.
- **AUTHCAT**: Identifies the type of institution responsible for the promotion/implementation of the policy classified according to the following categories:
    - Central banks: 1,
    - Financial supervisors and regulators: 2,
    - External (when either a government or non-governmental actor is involved): 3;
    - Multiple (when multiple government or non-governmental actors are involved): 4.
- **BIND**: Describes the bindingness of the policy. We assign the values as follows
    - no information on the bindingness (or the policy is not binding): 1,
    - Voluntary adoption: 2,
    - Mandatory adoption: 3.

Figure 3 displays the spatial coverage of the database and the total number of policies adopted by each country as of December 2020. Countries labeled in dark green, namely China and France, are the most engaged in all Policy Areas. Countries in light

High income **Advanced economies**	**Upper-middle income** **Emerging economies**	**Lower-middle income** **Developing economies**
Australia	Argentina	Bangladesh
Austria	Brazil	Cambodia
Bahrain	Bulgaria	Egypt
Belgium	China	Ghana
Canada	Colombia	India
Chile	Costa Rica	Kenya
Croatia	Ecuador	Mongolia
Cyprus	Fiji	Morocco
Czech Republic	Georgia	Nepal
Denmark	Indonesia	Nigeria
Finland	Kazakhstan	Pakistan
France	Lebanon	Philippines
Germany	Malaysia	Sri Lanka
Greece	Mexico	Ukraine
Hungary	Paraguay	Viet Nam
Iceland	Peru	
Ireland	Russia	
Israel	South Africa	
Italy	Thailand	
Japan	Turkey	
Latvia		
Lithuania		
Luxembourg		
Netherlands		
New Zealand		
Norway		
Panama		
Poland		
Portugal		
Saudi Arabia		
Seychelles		
Singapore		
South Korea		
Spain		
Sweden		
Switzerland		
United Arab Emirates		
United Kingdom		
United States of America		

Table 1.: Countries classification by income group - World Bank classification. Source: author elaboration

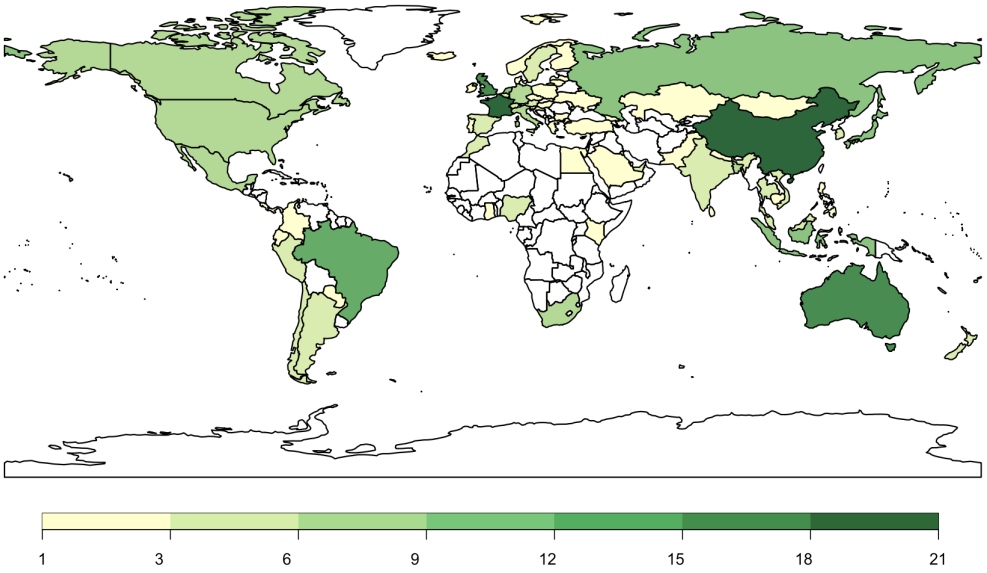

Figure 3.: Spatial coverage of the database and the total number of policies adopted by each country as of December 2020.

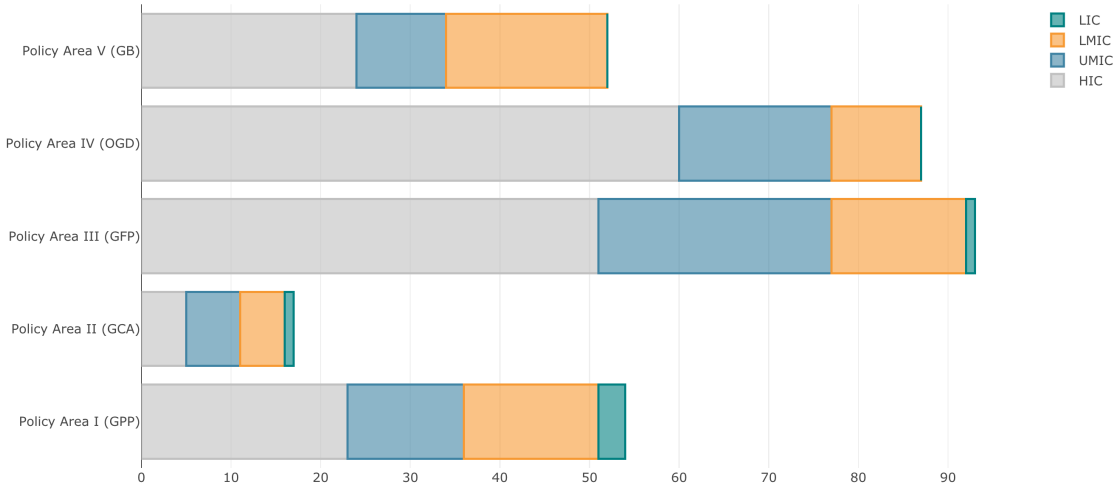

Figure 4.: Measures - sorted by Policy Areas - adopted by different income groups.

yellow are instead those that have adopted only a few policies so far. Evidence collected in the database shows that the financial sector has been more involved in integrating standards and policy efforts and promoting financial industry transparency and disclosure standards following an increased international engagement, as reported in Figure 7. At the international level, a stronger global engagement started in the early 2000s, and over the years, the financial industry has established many frameworks that are now part of what is known as the "sustainable finance landscape" (Buchner et al. 2017). Several actors, including the United Nations, the Financial Stability Boards, the Sustainable Banking Networks, and the Network for Greening the Financial System, are guiding the financial sector in transitioning to a green economy. Overall, the number of policies adopted each year around the world has risen over time, reflecting a greater level of participation among nations globally. We report in Figure 4 the distribution of policies according to income groups. Disclosure requirements (OGD) and green financial policies (GFP) are the most common and adopted by high-income countries (HIC). Upper-middle-income countries (UMIC) are characterized by high adoption of GFPs, followed by OGDs and green prudential policies. Low-middle-income countries (LMIC) have been more active in promoting green bonds, followed by green prudential regulations and financial principles. Low-income countries (LIC) account for the lowest share of overall adoption; a higher engagement in Policy Area I is instead reported for these countries.

Regarding the policy bindingness, 43% of the measures in the database are mandatory, 42% are non-binding (or no information was obtained about the bindingness), and 14% are voluntary measures, as shown in Figure 5. As shown in Figure 6, governments and central banks represent the largest shares of the authorities responsible for the policy's promotion and/or implementation, followed by financial supervisors and regulators.

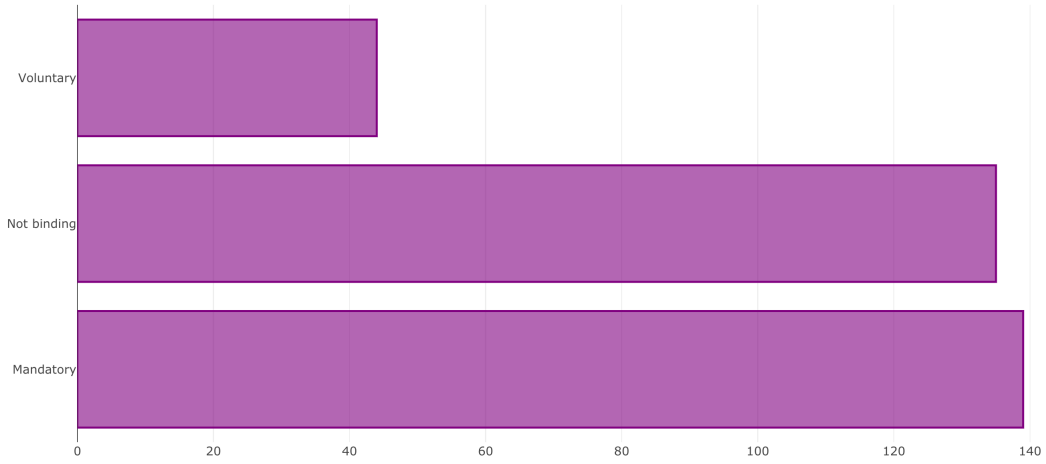

Figure 5.: Distribution of policy adoption by bindingness.

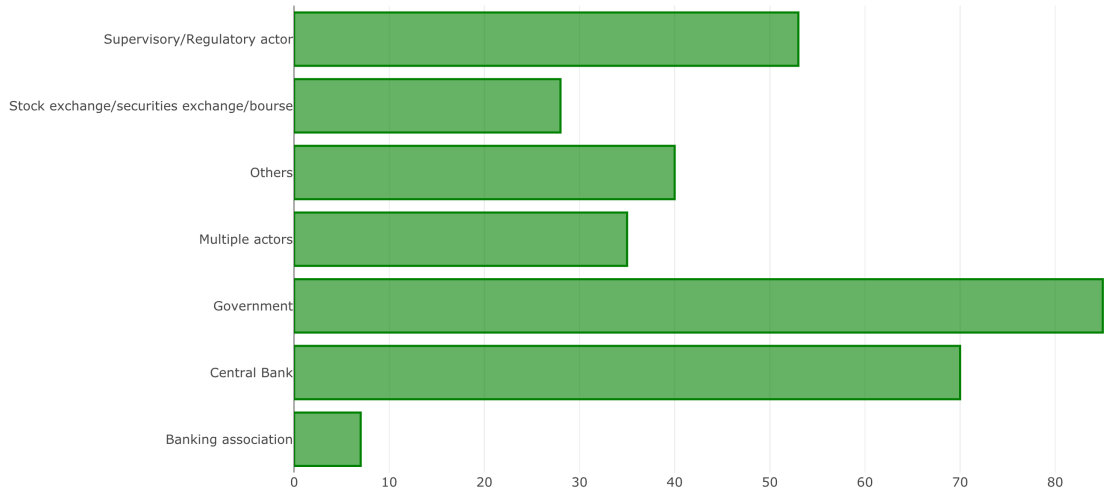

Figure 6.: Distribution of policy adoption by authority responsible for the policy's formulation or promotion.

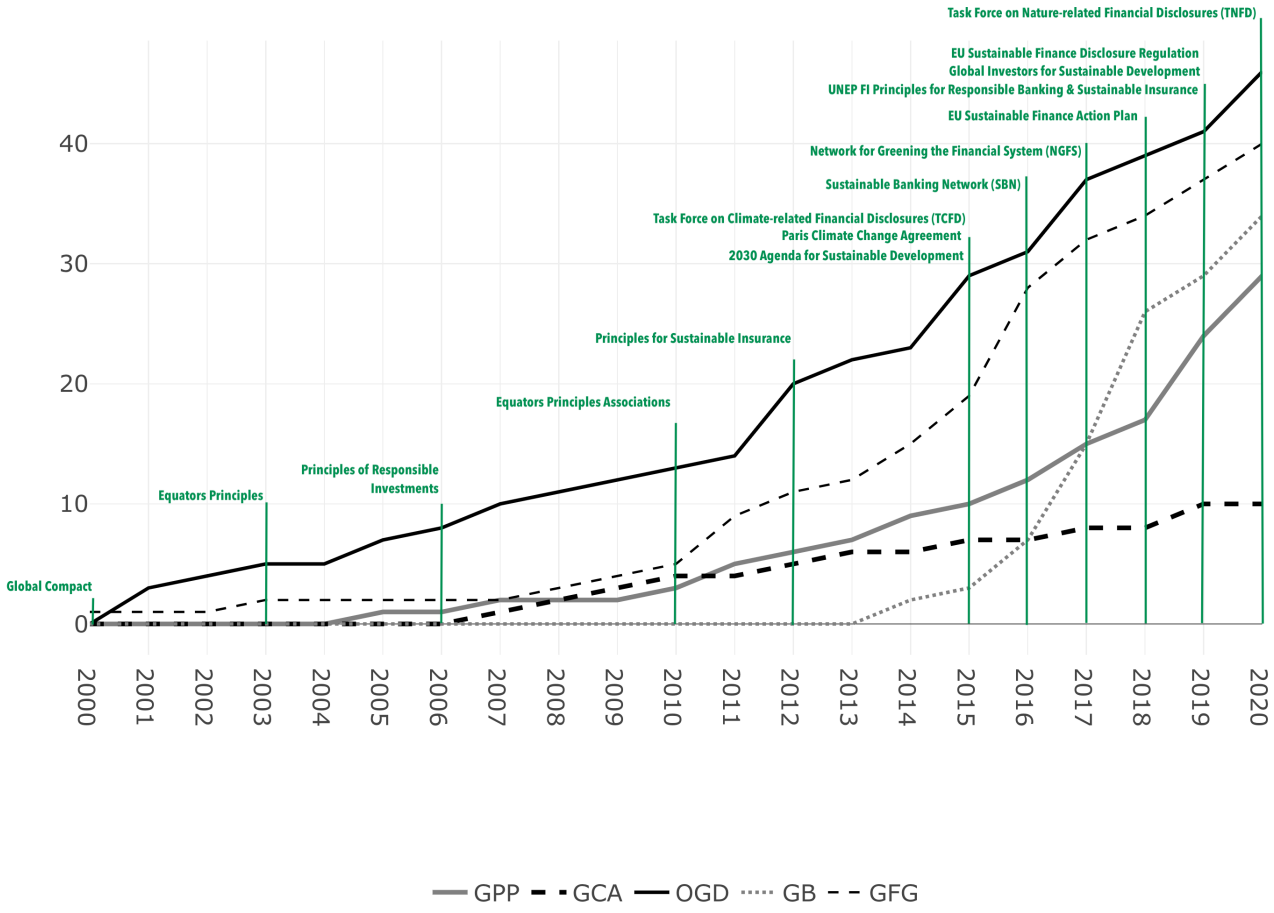

Figure 7.: Cumulated number of policies (by area) adopted globally and timeline of sustainable finance international initiatives; period: 2000-2020.
Notes. GPP: Green Prudential Policy; OGD: Other Green Disclosure Req.; GFG: Green Financial Guidelines; GB: Green Bonds; GCA: Green Capital Allocation

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