



Article

Monitoring G20 Countries' SDG Implementation Policies and Budgets Reported in Their Voluntary National Reviews (VNRs)

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Abstract: Monitoring Sustainable Development Goals (SDGs) has mainly focused on levels of achievement of targets and indicators, but few studies have examined policies and implementation efforts systematically. The Sustainable Development Solutions Network (SDSN) has called for more monitoring of policy efforts, which is necessary to understand why overall progress on SDGs has been insufficient. Responding to this call, this paper analyzes how the G20 countries' SDG implementation policies and budgets were reported in their Voluntary National Reviews and creates a dataset of these SDG policies and budgets. The results showed that the G20 countries cumulatively listed a large number of policies—over 4100—in their VNRs. These policies were widely distributed among SDGs. The combined total of listed budgets was over USD 2.7 trillion. Most of the policies were substantive, broad-scoped action plans, national strategies, frameworks, programs, or laws/regulations, not just small projects or awareness-raising campaigns. Overall, VNRs listed more policies after 2018 than before. Also, VNRs tended to include relatively more policies relating to SDGs highlighted at the High-Level Political Forum (HLPF) in the year the VNR was prepared. The results also showed that smaller or developing countries generally did not indicate fewer policies than larger or developed countries. Despite the large number of reported policies, some areas of under-reporting were identified, especially regarding environmental SDGs and targets. Budgetary information was fragmented, and clearly did not match the scale of the reported policies, so actual SDG budget expenditures are probably much higher than reported in the VNRs. In conclusion, insufficient progress on the SDGs cannot be attributed to a simple lack of policies. Therefore, further research is needed to examine the policies' actual contents, their appropriateness, level of ambition, level of funding, extent of implementation, and effectiveness. The database of policies created by this study is a necessary first step. The policy database can also be used to identify the G20 countries' relevant policies for specific SDGs or issue areas which span several SDGs for monitoring implementation of specific issue areas.

Keywords: SDGs; VNRs; G20; policies; implementation; budgets; HLPF

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1. Introduction

The objective of this study is to analyze the G20 countries' SDG implementation policies and budgets which were reported in their Voluntary National Reviews, asking four main questions. First, how substantial are the policies? Second, what is their distribution among SDGs? Third, to what extent did the policies start before or after the SDGs were adopted? Fourth, what are the similarities and differences in these policy trends between the developed and developing G20 countries? This study also created a dataset of these SDG policies. This study and its dataset will contribute to strengthening the monitoring and assessment of the progress of SDG implementation [1].

Policies are a key means of implementation of the SDGs even though they are not mentioned in SDG 17 on the means of implementation. Policies are also not mentioned in the UN's suggestions for preparing VNRs [2], even though Agenda 2030 states that each country will use different approaches and policies to implement the SDGs according to

their specific circumstances (paragraphs 55, 59) [3]. Nevertheless, without policies, it would be difficult to achieve the SDGs. The G20 countries appeared to understand the importance of policies since they reported many in their VNRs.

Progress on the SDGs, which were adopted in 2015, is off track, halfway through the implementation period [4–6]. However, the reasons for this have not been very systematically researched, the main exceptions being discussion of insufficient financing [7–9], or major global crises such as the COVID-19 pandemic and the war in Ukraine [10]. Much existing research on SDGs focuses on determining levels of achievement as evidence of insufficient progress rather than explaining why [4–6,11–13]. Potentially inadequate policies and weak implementation should be among the first factors to be examined in explaining insufficient progress.

However, there has been little research on SDG policy implementation efforts, particularly policies. Thus, the Sustainable Development Solutions Network (SDSN) has called for more monitoring of policy efforts [5,14]. SDSN's analysis identified 16 quantitative or quantifiable policy indicators and applied them to four of six "transformations" which synthesize the 17 SDGs, but not to the other two transformations. Many of these indicators are composite policy trackers produced by international organizations or consortia of research institutes such as the Energy Policy Tracker and the WHO's index of health care coverage. Others are voluntary commitments, for example NDC-based commitments to reach net zero greenhouse gas (GHG) emissions by 2050. A quantitative approach is laudable, but general commitments are not always a good indicator of actual efforts, and the creation of policy trackers requires substantial effort to collect detailed policy information in multiple countries. A subsequent SDSN study created an overall pilot index of governments' commitment and SDG efforts, including indicators of overall SDG strategies such as simply having a national SDG strategy, appointing coordinating units to lead SDG implementation, establishing monitoring strategies, and submitting VNRs; however, the index's scope is still limited to mainly procedural aspects, and it still does not include more concrete efforts or analyze specific policies [10]. The current study takes a more qualitative approach, identifying specific implementation policies for specific SDGs. The resulting dataset would facilitate the development of policy trackers.

Another study focused on overall SDG policies or coordination mechanisms rather than policies for implementing specific SDGs [15]. These included launching designated SDG action plans; linking SDGs with existing national plans; national institutional structures for SDG implementation, including multistakeholder processes in some cases; establishing or strengthening indicator and data collection systems; establishing national SDG monitoring frameworks; SDG publicity campaigns; and international cooperation initiatives. However, the study mainly cited examples, was not based on systematic data, and did not address specific SDG policies. Moreover, most studies in its bibliometric literature review on "SDGs and policy" were published before SDGs were adopted in 2015. The literature highlighted after 2015 also did not focus on specific policies implementing specific SDGs, and for many articles, the word "policy" was incidental to their actual main topics, for example, SDG interlinkages or achievement.

This study uses VNRs to examine the G20 countries' policy efforts to implement SDGs. This should be a natural starting point since the VNRs, which are reviewed at the HLPF each year, are the central element of the SDG follow-up and review process. Previous studies found that VNRs contain significant material on policies, though not as much on budgets, e.g., [16] but others like SDSN do not compile specific policy information from the VNRs, e.g., [10].

Other studies of VNRs do not analyze policies but rather focus on other aspects of VNRs such as national SDG implementation structures, the VNR preparation process, and specific topics like "Leave No One Behind", etc., as reviewed by [16,17]. Newer studies examining VNRs have followed the same pattern [18–20]. One report examined how VNRs addressed a few overall issues related to policies, such as whether countries made efforts to incorporate SDGs into national policies and strategies, "how countries have defined

national priorities and established national targets and indicators”, and “how they covered policy coherence for sustainable development”, but it did not examine specific policies or their distribution among SDGs [21]. Other studies examined Voluntary Local Reviews (VLRs), but they also do not address policies [22,23].

This study builds on a previous one which compiled the SDG implementation policies of the G20 countries as reported in their VNRs up to 2018 [16] and two similar studies on ASEAN countries [17,24]. The previous study of the G20 [16] was limited to compiling the policies and budgets, analyzing their distribution among the SDGs, and documenting each country’s strategy for organizing their VNRs.

The current study adds four new aspects. First, the data were updated, covering three additional years (2019–2021). The G20 countries issued 11 VNRs during this period, a substantial increase, bringing the total to 28. Three countries issued their first VNRs (UK, South Africa, and Russia), five countries issued their second, and two countries issued a third (Indonesia issued its second and third). Second, this study classifies policies by type. Third, data on policies’ years of implementation were collected and examined. Fourth, this study analyzes whether these results are related to the size of the countries’ economies or their level of development.

The G20 is a reasonable starting point to examine SDG implementation policies. The G20 countries comprise about 80 percent of the global economy, 80 percent of global GHG emissions, and about two-thirds of the global population, so they are expected to take the lead in implementing the SDGs. The G20 focus also enables comparisons between developed countries and major developing countries.

This study analyzes four aspects of the G20 countries’ policies. First, a dataset of the G20 countries’ SDG implementation policies and budgets is created, enabling an analysis of the number of each country’s policies for specific SDGs, providing a basic indication of effort. Second, the policies are classified into different types to assess their significance, exploring whether the policies and budgets are substantial (e.g., regulations), or are mainly small projects with small budgets or voluntary actions. Third, the year of the policies’ implementation was examined, if available, in order to ascertain the extent to which policies already existed before SDGs. Did countries mainly continue existing policies, or did they adopt new policies to strengthen SDG implementation? Fourth, this study examines whether these results are related to the size of countries’ economies or level of economic development.

The results of the previous study of the G20 countries [16] were confirmed and strengthened by this study. The previous study showed that the G20 countries listed a large number of policies in their VNRs, widely distributed among the SDGs and some countries listed related budgets. The current study shows that the newly issued VNRs significantly increased the total number of policies as well as the related budgets reported. Most of the policies were substantive, broad-scoped action plans, national strategies, frameworks, programs, or laws/regulations, not just small projects or awareness-raising campaigns. The results also showed that smaller or developing countries generally did not have fewer policies than larger or developed countries. Generally, only about one third the policies indicated the dates of their implementation; of these, about one third already existed before the SDGs, but two thirds were adopted after the start of the SDGs. This study has several limitations, including the fact that the number of policies is not necessarily a good indicator of efforts, data gaps, and the fact that this study could not examine the extent of the policies’ implementation or effectiveness. Nevertheless, it is hoped that this study could provide a good basis for further research on SDG policy implementation.

The rest of this paper is organized as follows. Section 2 discusses the methodology. Section 3 presents the results, and Section 4 concludes.

2. Methodology

2.1. VNRs

Policy and budget information was synthesized from the G20 countries’ 2016–2021 VNRs. In total, 28 VNRs were published by 18 of the 19 individual G20 countries (excluding the EU). Some countries published 2 or 3 VNRs. Only the US had not published a VNR by 2022. Figure 1 summarizes the G20’s VNR timeline. The two VNRs from 2022 were not included in this study due to insufficient language capability to analyze Argentina’s VNR which was only published in Spanish, and because Italy’s VNR only included local actions and excluded national actions and policies, so it was not comparable with the nationally focused VNRs in this study.

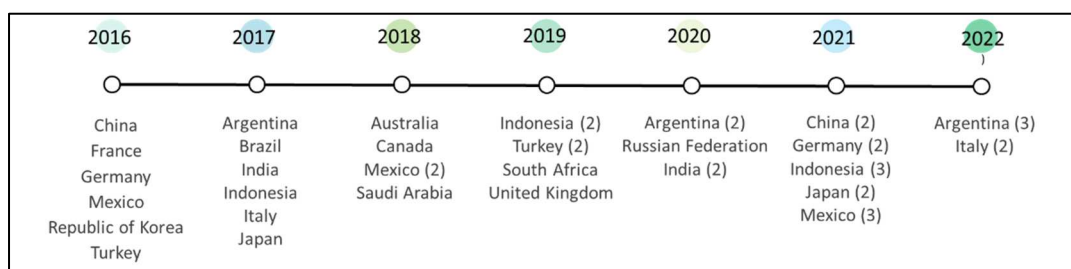


Figure 1. Timeline of Published VNRs. Note: (2) indicates the country’s second VNR; (3) indicates the country’s third VNR. Source: UN SDGs website [25].

Countries’ VNRs report their SDGs implementation progress. VNRs are a key element of the follow-up and review process, and they are presented at the annual High-level Political Forum (HLPF), which highlighted different main themes and specific SDGs each year, as indicated in Table 1. Several SDGs were highlighted each year to be reviewed in-depth. SDG 17 was highlighted each year, and five or six other SDGs (about one-third) were highlighted each year from 2017–2019, so all SDGs were highlighted by 2019. None were highlighted in 2020 due to the COVID-19 pandemic, while half were highlighted in 2021.

Table 1. HLPF themes and highlighted goals.

Year	Main Theme	Highlighted SDGs																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
2016	Ensuring that no one is left behind																		X
2017	Eradicating poverty and promoting prosperity in a changing world	X	X	X		X				X					X				X
2018	Transformation towards sustainable and resilient societies							X	X			X	X			X			X
2019	Empowering people and ensuring inclusiveness and equality				X				X	X				X				X	X
2020	Accelerated action and transformative pathways: realizing the decade of action and delivery for sustainable development																		X
2021	Sustainable and resilient recovery from the COVID-19 pandemic that promotes the economic, social, and environmental dimensions of sustainable development	X	X	X						X	X		X	X				X	X

Source: UN SDGs website [25].

If a country published more than one VNR, all policies from all VNRs were combined, taking into account repeated policies and creating a comprehensive list. For three countries (Argentina, China, and Mexico), it was not possible to compile a comprehensive list by SDG because they completely changed the structure of their VNRs, but their policies were still compiled in the dataset and included in the cumulative total number of policies.

2.2. Compilation of Policies and Budgets

For compiling the policy and budget datasets, this study used the same methodology as the previous related studies [16,24]. To summarize, all sections of the VNRs were checked for policies and budgets, including introductory and cross-cutting sections as well as sections on specific SDGs. The definition of “policy” was interpreted broadly, although it was limited to concrete efforts, including projects and programs as well as policies. Vague statements of objectives, the importance of particular topics, and intentions to take future action or develop new future policies were not included.

It was not always easy to determine whether policies were “concrete” enough to be counted. This was based only on each policy’s name and the context of the discussion in the VNR’s text. The VNRs were the only source of information on policies and budgets; it was not possible to consult any other sources or documents from individual countries. The authors did not interpret “concreteness” very strictly and tried to err on the side of including more policies rather than fewer.

Only domestic policies of national governments were included; this study did not include international cooperation policies or initiatives by local governments, business, or civil society. Also, regarding budgets, only amounts for domestic spending were examined; budget amounts for international cooperation or spending by local governments or other stakeholders were not included in this study. Certainly, international cooperation efforts are important, but this study focuses on countries’ domestic efforts. Similarly, initiatives by non-governmental stakeholders and local governments are also important, but the SDGs were created and agreed by national governments who are responsible for their achievement. Thus, VNRs are prepared by national governments, and they do and should emphasize national governments’ efforts. Most VNRs mention some initiatives by local governments, business, and civil society, but these are mainly examples and not comprehensive, so it is not possible to analyze them systematically based on VNRs, and they are not the focus of this study.

Many VNRs listed some policies under multiple SDGs, especially broad strategies or action plans. In these cases, the policy was listed under all relevant SDGs as each country included them in their VNRs, and the repetitions were noted in the data tables.

Budget information was easier to identify, although only specific numerical amounts were compiled. However, interpretation of the budget amounts is highly problematic. Most budget items were isolated amounts mentioned in the text with little context; there were very few budget tables with consistently defined numbers. Key points about the budget numbers were often not clear such as their date, time span (1 or more years), or whether some amounts might be included within other amounts, or whether some amounts mentioned under one SDG might also be relevant for other SDGs.

For the 2016–2018 VNRs, this study uses the policies and budgets as compiled by [16]. The lists of policies and budgets from the 2019–2021 VNRs were newly compiled by the current study. This study combines the data on the 2016–2018 VNRs, as compiled by [16], with the newly updated information from the 2019–2021 VNRs to create cumulative policy and budget datasets covering 2016–2021.

2.3. Policy Year

The year each policy was adopted or implemented, if identifiable in the VNR’s text, was noted in the dataset. Countries did not specify dates for many policies. Dates could refer to various stages of the policy decision or implementation process, which differ widely between countries. In some countries, the key decision is made before the final official adoption, and the contents of policies may change very little, and final approval is assured. However, in other cases, the policy contents may be considerably changed before final approval, or the policy may be dropped altogether. Moreover, even after final approval, some policies specify a later implementation date. In some cases, what stage a specific date referred to was not clear. Therefore, the dates are not very comparable, even within a specific country’s VNR.

2.4. Policy Classification

Policies were classified according to the policy types in Table 2. The classification system was developed inductively and aimed to minimize the number of policies classified as “other”. The classifications (20 plus “other” for a total of 21) can be grouped into five categories. Specific budgetary information mentioned in the VNR was also compiled. The classification was based only on each policy’s name and the context in the VNR’s main text; it was not possible to consult any other sources from individual countries.

Table 2. Policy type classifications and criteria.

Policy Type	Code	Criteria/Examples
		1. Major Laws, Policies, Strategies, Enforcement
Law/Regulation	LR	Law, order, legislation, act, decree, code, control program, regulation, agreement, reform, standards, guidelines
National Policy	NP	Policy, package
Strategy/Action Plan	SA	Strategy, action plan, plan, master plan, scheme, framework, roadmap, mission, a program that is broad or acts as an action plan for the entire issue (for example, a national program)
Enforcement	EN	Additional efforts or measures to enforce existing laws, regulations, etc.
		2. Money-related Policies
Tax/Spending	TS	Taxes, government spending, investments, pensions, subsidies, insurance coverage (assumed government contributions), cash transfers, allowances, benefits, grants, aid
Pricing	PR	Price regulation
Financing	FN	Fund, loan, scholarship, deposits, bonds
		3. Physical Infrastructure, Land Management
Infrastructure	IN	Physical infrastructure, equipment, buildings, roads, transportation infrastructure, digital infrastructure such as broadband networks, development of physical infrastructure
Protected Area/Park	PA	Physical area. May be created by a law, program, etc.
Forest/Conservation	FR	Planting trees, forest conservation
		4. Projects, Programs
Project/Initiative	PJ	Project, initiative (combined this as they are both focused actions to address something)
Program	PG	Smaller-type programs, more focused, less broad—not national programs
		5. Information-related Policies
Monitoring	MO	Monitoring, evaluation, observation, surveillance
Awareness Raising	AR	Public information, promoting public awareness, etc.
Training/Education	TR	Training, education, capacity building, for example to improve practices a workplace/organization/etc.
Information/Data	ID	Information systems, directory, data collection, providing information to the public, index, catalogue, providing guidelines
Certification/Labeling	CR	Certification, labeling, awards
Registration	RJ	Registry
		6. Other
Agency/Department	AG	Creation of a new agency or department
Research	RS	Research, development of technology
Other	OT	Committees, hotlines, white papers, encouragement, general promotion, vague, or difficult to classify

The first policy category comprises major laws, regulations, policies, strategies, and enforcement measures. These could be mandatory or voluntary or a combination of both. Many action plans and strategies are very broad, encompassing a wide range of policy areas, but others could be more focused. It could be assumed that they have budget lines, but the VNRs typically did not indicate budget lines for policies which were not mainly focused on providing direct financial outlays to stakeholders. In some cases, new, supplementary, or stronger measures were adopted to enforce existing laws, regulations, and policies. The second category is related to money, especially government spending (e.g., subsidies), taxes, financing (loans, guarantees), and price regulations. Policies such as pensions and insurance were included in this category if they involved financial contributions from the government. The third category is actual physical infrastructure (such as airports, specific

buildings, railways, etc.), and specific land uses including protected areas, parks, and tree planting. Of course, these policies also need funding, which is assumed to be provided, but they were not classified as budget-related. If a specific budget line was mentioned, then it was included in the budget data, but most VNRs did not mention this information. The fourth category is projects and programs. These generally involve government support for specific activities. Their scope could range widely from large programs with many components to small, focused projects. It was sometimes difficult to determine a project or program's relative scale just from the VNR, so these were mainly coded according to the wording. Projects or programs in some countries could be similar in scope to national strategies and action plans in other countries, so these classifications are not necessarily comparable. The fifth category contains various policies related to information such as data collection and monitoring, providing information to the public, awareness-raising, education and training, certification systems, and awards. Two other categories were research/development and creating new agencies or organizations. The "other" category includes miscellaneous policies which appeared small or were difficult to classify.

Some policy categories such as laws and strategies may have various subsidiary policies as well as related budgets. For example, sometimes laws are written generally and direct a more detailed strategy to be developed, and the strategy will call for the creation of more specific projects and programs. All policy types may have related budgets.

Policies were coded according to the policy name unless the VNR text provided additional clarification or explanation that indicated a more appropriate category. It was not possible to consult any sources outside of the VNRs. Each policy was assigned only one category, even though some policies might be interpreted as falling under more than one category.

After determining the total number of policies, including the number of repeated policies, the proportion of policies classified under each SDG was calculated. Budget items were converted to USD and similarly summarized. The policy dataset, including their classification by policy type, and budgets are provided in the Supplementary Materials.

3. Results

3.1. VNR Structure and Organization

Information on the structure and presentation style of VNRs and budgets is presented in Table 3. Individual G20 countries (except the US) published 28 VNRs in total as of 2021. Argentina, China, Germany, India, Japan, and Turkey published two VNRs, while Indonesia and Mexico published three, and ten countries published only one VNR as of 2021. Argentina and Italy also published VNRs in 2022, but these were not included in this study since they are not available in English.

Table 3. Comparison of countries' VNRs overall SDG reporting and budget reporting approaches.

Country	VNR Year	Overall Reporting Style			Budget Reporting Style		
		All SDGs	Partial/by HLPF	Country-Specific Style	Full Budget Information	Partial Information	No Information
Argentina	2017			X		X	
Argentina *	2020	X			X		
Australia	2018	X				X	
Brazil	2017		X			X	
Canada	2018	X				X	
China	2016	X					X
China	2021			X		X	
France	2016	X				X	
Germany	2016	X				X	
Germany	2021	X				X	
India	2017		X			X	
India	2020	X				X	

Table 3. Cont.

Country	VNR Year	Overall Reporting Style			Budget Reporting Style		
		All SDGs	Partial/by HLPF	Country-Specific Style	Full Budget Information	Partial Information	No Information
Indonesia	2017		X				X
Indonesia	2019		X			X	
Indonesia	2021		X			X	
Italy *	2017			X		X	
Japan	2017			X			X
Japan	2021			X		X	
Mexico	2016	X					X
Mexico	2018	X				X	
Mexico	2021			X			X
Republic of Korea	2016	X					X
Russia	2020	X				X	
Saudi Arabia	2018	X				X	
South Africa	2019	X			X		
Turkey	2016	X					X
Turkey	2019	X				X	
UK	2019	X				X	
Total VNRs	-	17	5	6	2	19	7

Source: UN SDG website [25]. * Note: Argentina and Italy also published VNRs in 2022, but these were not included in this study.

Regarding the VNR structures, nine countries which published one VNR organized them based on individual SDGs. Eight of these countries addressed all SDGs (Australia [26], Brazil [27], Canada [28], France [29], the Republic of Korea [30], the Russian Federation [31], Saudi Arabia [32], South Africa [33], and the UK [34]), while Brazil's VNR only addressed the SDGs highlighted at that year's HLPF. Italy's 2017 VNR [35] was organized according to five priority areas (People, Planet, Prosperity, Peace and Partnership).

Among the six countries which published two VNRs, Argentina and China changed the structures of their VNRs. Argentina's first VNR (2017) focused on the SDGs highlighted at the 2017 HLPF, presenting them in three priority areas, Universal Income, Quality of Life, and Social Mobility [36]. In contrast, Argentina's second VNR was organized by SDGs and addressed all of them. Argentina's second VNR's format made it easier to link policies and budgets with specific SDGs and facilitated comparison with other countries' VNRs [37].

China's first VNR (2016) addressed all SDGs individually [38]. However, China's second VNR (2021) was organized according to five priority areas (poverty reduction, climate and environmental governance, COVID-19 and recovery, food and agricultural governance, and infrastructure) [39]. China's second VNR focused more on indicators and achievements rather than the means of implementation, so it contained substantially fewer policies compared to its first VNR.

Germany [40,41], India [42,43], Japan [44,45], and Turkey [46,47] used the same structure for both of their VNRs. Three countries (Germany, India, and Turkey) organized their VNRs by SDGs. Germany and Turkey reported on all SDGs, although India's first VNR in 2017 reported only on the SDGs highlighted at that year's HLPF. Also, Turkey's first VNR did not report on any specific policies or budget items but rather addressed general trends with each individual SDG. In contrast, Japan developed its own structure based on eight national priorities: (1) the revitalization of gender equality and a society where every person can play an active role, (2) achievement of good health and longevity, (3) creating growth markets, revitalization of rural areas, and promoting science technology and innovation, (4) sustainable and resilient land use, promoting quality infrastructure, (5) energy conservation, renewable energy, climate change counter-measures, and sound material-cycle society, (6) conservation of environment, including biodiversity, forests and oceans, (7) achieving peaceful, safe, and secure societies, and (8) strengthening the means and frameworks of the implementation of the SDGs instead of organizing its VNR by SDGs. Thus, Japan's VNRs are difficult to compare with the others.

Two countries, Indonesia [48–50] and Mexico [51,52], published three VNRs. Indonesia organized each of its three VNRs by SDGs, mainly focusing on those which were highlighted at the HLPF in the years that they were published. In contrast, Mexico used a different structure each time. Mexico’s first VNR was similar to Turkey’s first VNR, which did not report on any specific policies or budget items, so it was not included in this study. Mexico’s second VNR reported on all SDGs and structured the information by SDG. The country’s third VNR reported policies based on the jurisdictions of the relevant ministries. Thus, there was no way to identify which SDG the policies were related to except for a few instances in which it was directly mentioned in the text. Therefore, it was difficult to compare Mexico’s policies with those of other countries.

Information on budgets was included in 21 of the 28 VNRs, but not systematically, and there was a large variation in the amount of budget-related information reported. Two countries reported overall information for each SDG—Argentina (2020) and South Africa—while six VNRs of five countries did not include any budgetary information (China’s 2016 VNR, Indonesia’s 2017 VNR, Japan’s 2017 VNR, Mexico’s 2016 and 2021 VNRs, and Turkey’s 2016 VNR). The rest of the VNRs included varying degrees of partial budgetary information. Three countries which initially reported no budget information reported some budget information in their most recent VNRs (China, Japan, and Turkey), while Mexico, in contrast, omitted budgetary information from its most recent VNR even though it reported some information in its first VNR.

3.2. Distribution of Policies among SDGs

The first step in the analysis combined the policies of each VNR for three countries (Germany, India, and Indonesia), which published more than one VNR to calculate the total number of policies and their distribution among the SDGs for each country (Table 4). The next step combined the results of Table 4 with data from the countries which submitted only one VNR in Table 5.

Table 4. Compilation and distribution of policies from different VNRs of the same country.

SDG	Germany 2016	Germany 2021	Germany Total 2016 + 2021	India 2017	India 2020	India Total 2017 + 2020	Indonesia 2017	Indonesia 2019	Indonesia 2021	Indonesia Total 2017 + 2019 + 2021
1	8	4	11	20	14	29	24	1	30	49
2	3	7	9	8	14	18	17		33	46
3	2	5	6	17	16	28	10		43	46
4	5	12	16	1	11	11		27	3	29
5	6	9	14	10	9	18	21		1	22
6	1	6	7		9	9			1	1
7	2	4	6		13	13			9	9
8	18	13	29		11	11		9	26	34
9	7	14	14	14	6	20	9		4	13
10	3	5	6		20	20		7	11	14
11	5	10	14		9	9			2	2
12	9	17	22		18	18			31	31
13	6	8	10		18	18		9	13	20
14	5	7	8	9	21	24	10	2	7	12
15	6	11	15		17	17			3	3
16	1	7	8		12	12		11	28	37
17		3	3		10	10		9	8	16
Total	87	142	198	79	228	285	91	75	254	384

Source: Compiled by authors from VNRs [16,25]. Note: policies that were duplicated among the country’s VNRs were subtracted from each country’s total.

Countries which submitted more than one VNR organized by SDGs, generally increased the number of policies listed in each subsequent VNR. In Germany, the distribution changed somewhat; the top four SDGs in its 2016 VNR were SDGs 8, 12, 1, and 9, while in its 2021 VNR, the top four were 12, 9, 8, and 4, and the number of reported policies decreased for SDGs 1 and 8. For India, there was a much larger increase in the total number

of policies, probably because its 2020 VNR reported on all SDGs, compared to its 2017 VNR, which only reported on seven SDGs. It is somewhat surprising, though, that the number of policies that India reported for SDGs 1 and 9 significantly decreased, and those for SDGs 3 and 5 slightly decreased. Indonesia's first two VNRs mainly addressed the SDGs highlighted at the HLPF in those years (which focused on different SDGs), so it is difficult to draw inferences about changes in the distribution of Indonesia's SDG policies. Indonesia's third VNR, in contrast, covered most SDGs, except SDGs 5, 6, 9, and 17. In addition, Indonesia's third VNR reduced the number of policies reported for SDGs 4, 9 and 14. The reduction in the number of policies reported for a few SDGs by these three countries does not necessarily mean that these policies ended or that the priority of these SDGs was reduced; it could mean that the VNR preparation plan shifted the focus, or that some relevant policies were simply overlooked in the VNR preparation process.

Table 5. Compilation and distribution of policies from all countries that structured their VNRs by SDG.

SDG	Argentina (2020)	Australia (2018)	Brazil (2017)	Canada (2018)	China (2016)	France (2016)	Germany (Total)	India (Total)	Indonesia (Total)	Mexico (2018)	R. of Korea (2016)	Russia (2020)	Saudi Arabia (2018)	South Africa (2019)	Turkey (2019)	UK (2019)	Total	%
1	5	16	13	11	4	4	11	29	49	8	5	14	7	16	24	29	245	7.0%
2	28	9	4	6	11	3	9	18	46	2	4	16	4	39	17	38	254	7.3%
3	12	36	11	17	19	5	6	28	46	8	6	15	19	8	54	27	317	9.1%
4	21	17		12	12	4	16	11	29	7	6	20	39	13	33	34	274	7.8%
5	6	11	6	14	8	7	14	18	22	5	3	18	12	26	21	23	214	6.1%
6	10	18		5	5	3	7	9	1	6	4	17	1	16	22	19	143	4.1%
7	13	19		8	2	6	6	13	9	8	3	9	10	30	15	29	180	5.2%
8	17	44		17	11	8	29	11	34	7	4	35	7	11	30	29	294	8.4%
9	20	40	5	9	7	3	14	20	13	6	3	24	21	7	28	29	249	7.1%
10	7	8		16	1	4	6	20	14	7	7	19	2	4	21	32	168	4.8%
11	11	10		12	13	5	14	9	2	9	6	15	5	4	28	44	187	5.4%
12	8	8		18	3	4	22	18	31	7	5	18	6	6	16	26	196	5.6%
13	6	10		10	2	5	10	18	20	10	3	13	16	10	25	28	186	5.3%
14	6	18	8	3	9	6	8	24	12	8	5	8	3	5	19	21	163	4.7%
15	10	25		6	16	3	15	17	3	7	4	19	4	6	18	24	177	5.1%
16	16	12		12	5	5	8	12	37	9	2	14	4	11	29	31	207	5.9%
17	5			2			3	10	16			1					37	1.1%
Total	201	301	47	178	128	75	198	285	384	114	70	275	160	212	400	463	3491	
Total *	191	293	47	142	126	73	159	235	345	112	22	239	157	191	337	417	3086	

Source: Compiled by authors from VNRs [16,25] incorporating data from Table 4. Notes: Total = total number of policies accounting for policies mentioned in multiple SDGs; Total * = total number of policies without accounting for policies mentioned in multiple SDGs; percentages were calculated using the Total not the Total *; Only countries that organized their VNRs by SDG are included.

Table 5 shows the distribution of policies among SDGs for all G20 countries which structured their VNRs by SDG during the study period. The top three SDGs (excluding 17) were 3, 8, and 5, each accounting for about 7 to 9 percent of the total. In contrast, the SDGs with the fewest policies were 6, 15, and 10, each accounting for between 4 and 5 percent of the total. Thus, the range between the highest (9.1 percent) and the lowest (4.1 percent) was not very large. However, the variations were much larger within and between countries. SDG 17 likely showed the least amount of policies because this study

only included domestic policies; many G20 countries listed policies related to international cooperation and international policies under SDG 17, but they were not in the scope of this report.

The findings suggest that there could be a modest degree of prioritization in the G20's VNRs, with some additional emphasis on health, decent work/economic growth, and gender equality. Poverty reduction (SDG 1) was not in the top 3, but it was in the top 6. So-called environmental SDGs 6, 7, and 12–15 were all in the bottom half, but they still collectively accounted for 35 percent of the total number of policies. Certainly, the number of policies may not be the best means to assess SDG prioritization, but it is one piece of evidence.

The results of Table 5, which include information from all VNRs up to 2021, are compared with the results of [16], which included the information up to 2018, in Table 6. It shows that the number of policies the 20 countries cumulatively reported in their VNRs on specific SDGs more than doubled from 2018 to 2021. This is not only because 3 countries newly issued their first VNR during that period, but also 9 countries issued their second VNR, and these second VNRs contained significantly more policies than their first VNRs (see Figure 1). Moreover, the overall distribution of policies between SDGs did not change substantially. Two SDGs increased their share by about 2 percentage points (SDGs 2, and 16), while three SDGs reduced their share by a similar amount (SDGs 1, 3, 9). The shares of the other SDGs changed by less than 1.8 percentage points.

Table 6. Comparison of the Number and distribution of policies from all countries that structured their VNRs by SDG in 2018 and 2021.

SDG	2018 Total	2018 %	2021 Total	2021 %	Number of Policies, 2018–2021 Change	Share of Total Policies, 2018–2021 Change
1	122	9.1%	245	7.0%	101%	−2.1%
2	73	5.4%	254	7.3%	248%	1.8%
3	146	10.9%	317	9.1%	117%	−1.8%
4	106	7.9%	274	7.8%	158%	−0.1%
5	104	7.8%	214	6.1%	106%	−1.6%
6	44	3.3%	143	4.1%	225%	0.8%
7	61	4.6%	180	5.2%	195%	0.6%
8	117	8.7%	294	8.4%	151%	−0.3%
9	124	9.3%	249	7.1%	101%	−2.1%
10	50	3.7%	168	4.8%	236%	1.1%
11	65	4.9%	187	5.4%	188%	0.5%
12	62	4.6%	196	5.6%	216%	1.0%
13	55	4.1%	186	5.3%	238%	1.2%
14	84	6.3%	163	4.7%	94%	−1.6%
15	71	5.3%	177	5.1%	149%	−0.2%
16	52	3.9%	207	5.9%	298%	2.0%
17	3	0.2%	37	1.1%	1133%	0.8%
Total	1340		3491		161%	

Sources: [16] and Table 5.

3.3. Total Number of Policies

Policies of countries which did not organize their VNRs are summarized according to their respective national categories in Table 7 (Argentina), China (Table 8), Italy (Table 9),

Japan (Table 10), and Mexico (Table 11). To calculate the total number of the G20's SDGs, the data from Tables 5 and 7, Tables 8–11 were combined in Table 12.

Table 7. Number of Policies in Argentina's 2017 VNR.

Areas	Number of Policies
Universal Income	11
Quality of Life	7
Social Mobility	9
Total	27
Total *	4

Source: compiled from [16], based on [36]. Note: Total * excludes policies which were repeated in Argentina's 2020 VNR.

Table 8. Number of policies in China's 2021 VNR.

Areas	SDGs	Number of Policies
1: Poverty reduction	1, 4, 16	28
2: Climate and environmental governance	6, 12, 14, 15	17
3: COVID-19 and recovery	8, 10	9
4: Food and agriculture governance	2	11
5: Infrastructure	5, 7, 9, 11	10
Total		75
Total *		68

Source: compiled by authors from China's 2021VNR [39]. Note: Total * excludes policies which were repeated in China's 2016 VNR.

Table 9. Number of policies in Italy's 2017 VNR.

Areas	SDGs	Number of Policies
People	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13	57
Planet	2, 6, 9, 11, 12, 13, 14, 15	39
Peace	2, 4, 5, 8, 10, 15, 16	31
Prosperity	2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	82
Partnership	1, 2, 3, 4, 5, 6, 7, 8, 9	0
Total		209
Total *		127

Source: compiled by authors from [16] based on [35]. Note: Total * does not include policies mentioned in multiple SDGs.

The overall results showed that the G20 countries included a large number of policies in their VNRs: 4112 in total, including 3579 distinct policies and 533 repeated policies (about 13% of the total). The UK, Turkey, and Indonesia reported the most policies (463, 400, 384, respectively) during the study period. However, the total number of Indonesia's policies is based upon all three of its VNRs. Brazil, Republic of Korea, and France reported the fewest policies (47, 70, 75, respectively).

The total number of policies as of 2021, 4112, is more than double the amount found as of 2018 in the previous study—1631 [16]. Overall, this was due to (a) three countries reporting for the first time from 2019, and (b) nine countries reporting for the second or third time, which generally included more policies in their second and third VNRs. Note that most of the increased number of policies was by the countries which reported policies by SDG (see Table 6) rather than those which did not report their policies by SDG.

The comparatively smaller number of policies in some countries' VNRs may be due to the structure or timing of their VNRs. Korea's VNR mainly presented overarching framework policies with many components. Brazil, Korea, and France were among the first countries to issue VNRs, which had not been updated at the time this study was conducted. Brazil's VNR only focused on the six SDGs that were the focus of that year's HLPF.

Table 10. Number of policies in Japan's VNRs.

Priority Areas	Relevant SDGs	Number of Policies (2017)	Number of Policies (2021)	Total (2017 + 2021 Policies – Duplicates)
1: Realization of gender equality and a society where every person can play an active role	1, 4, 5, 8, 10, 12	13	37	44
2: Achievement of good health and longevity	3	1	8	8
3: Creating growth markets, revitalization of rural areas, and promoting science technology and innovation	2, 8, 9, 11	4	8	11
4: Sustainable and resilient land use, promoting quality infrastructure	2, 6, 9, 11	6	6	14
5: Energy conservation, renewable energy, climate change counter-measures, and sound material-cycle society	7, 12, 13	8	15	22
6: Conservation of environment, including biodiversity, forests and oceans	2, 3, 14, 15		11	11
7: Achieving peaceful, safe, and secure societies	16	3	8	10
8: Strengthening and means and frameworks of the implementation of the SDGs	17	3	2	5
Total		37	95	125
Total *				120

Source: compiled by authors from Japan's 2021 VNR [16,45]. Note: Total * = total number of policies not including policies mentioned in multiple SDGs.

Table 11. Number of policies in Mexico's 2021 VNR.

Areas	Number of Policies
Total	178
Total *	169

Source: compiled by authors from Mexico's 2021 VNR [52]. Note: Total * excludes the policies also in Mexico's 2018 VNR [51].

Table 12. Total number of policies in G20 countries' VNRs.

Country/Group	Total	Total *
VNRs reporting each SDG (Table 5)	3491	3086
Argentina (2017)	27	4
China (2021)	75	68
China (2018)—policies that were not organized by SDG	7	5
Italy (2017)	209	127
Japan (total, 2017 + 2021)	125	120
Mexico (2021)	178	169
Total	4112	3579

Source: countries' VNRs [16,25]. Note: Total * = total number of policies not including policies mentioned in multiple SDGs.

Among countries which published their second or third VNR all but one increased the number of reported policies, often substantially. Mexico's and Turkey's 2016 VNRs and Argentina's 2017 VNR were among the first. Mexico and Turkey did not list any policies, while Argentina listed only a few. But these countries' subsequent VNRs included many policies—112 in Mexico's 2018 VNR, 191 in Argentina's 2020 VNR, and 245 in Turkey's 2019 VNR, the latter two being among the highest in the G20. The number of policies in three countries more than doubled: India, Indonesia, and Japan. Thus, several emerging economies had the largest increases in the number of policies, while two developed countries, Japan and Germany, had smaller percent increases. China was the only country which reported fewer policies in its second VNR.

These large increases in the number of reported policies were probably due to having additional time to strengthen reporting processes and collect more information from more departments and learn from other countries' VNRs, as well as to changes in their VNR structures and reporting styles. It is unlikely that the total number of these coun-

tries' actual policies significantly increased or decreased. Rather, VNR preparation efforts probably increased.

Overall, the numbers showed that the G20 countries have many SDG-related policies. Some policies, especially laws and strategies, often have related subsidiary policies, so the actual total could be higher or lower depending on how or to what extent subsidiary policies are counted separately. Moreover, the policies documented in the VNRs probably do not provide a comprehensive list of countries' SDG implementation policies. Instead, they often highlight notable and/or innovative SDG-related policies, or perhaps the departments which made more efforts to contribute to the VNR. Sometimes VNRs emphasize SDGs highlighted at a particular year's HLPF. The number of policies may also be related to the available staff time and capacity.

3.4. SDG Policies Compared to GDP and GDP per Capita

Simple comparisons of the total number of each country's SDG policies with their 2019 GDP and GDP per capita are illustrated in Figures 2 and 3. The results showed no overall relationship between the number of policies reported by a country and its GDP or GDP per capita. Regarding GDP per capita, there was some tendency towards an inverse relationship—higher-income countries like Japan and Germany tended to list fewer policies compared to middle-income countries, especially Indonesia, Mexico, and Turkey. However, there were major exceptions—high-income countries Australia and the UK had a large number of policies, while middle-income Brazil listed the second lowest number of policies among G20 countries. Therefore, neither GDP nor GDP per capita appeared to be a significant determinant of the number of policies reported in countries' VNRs.

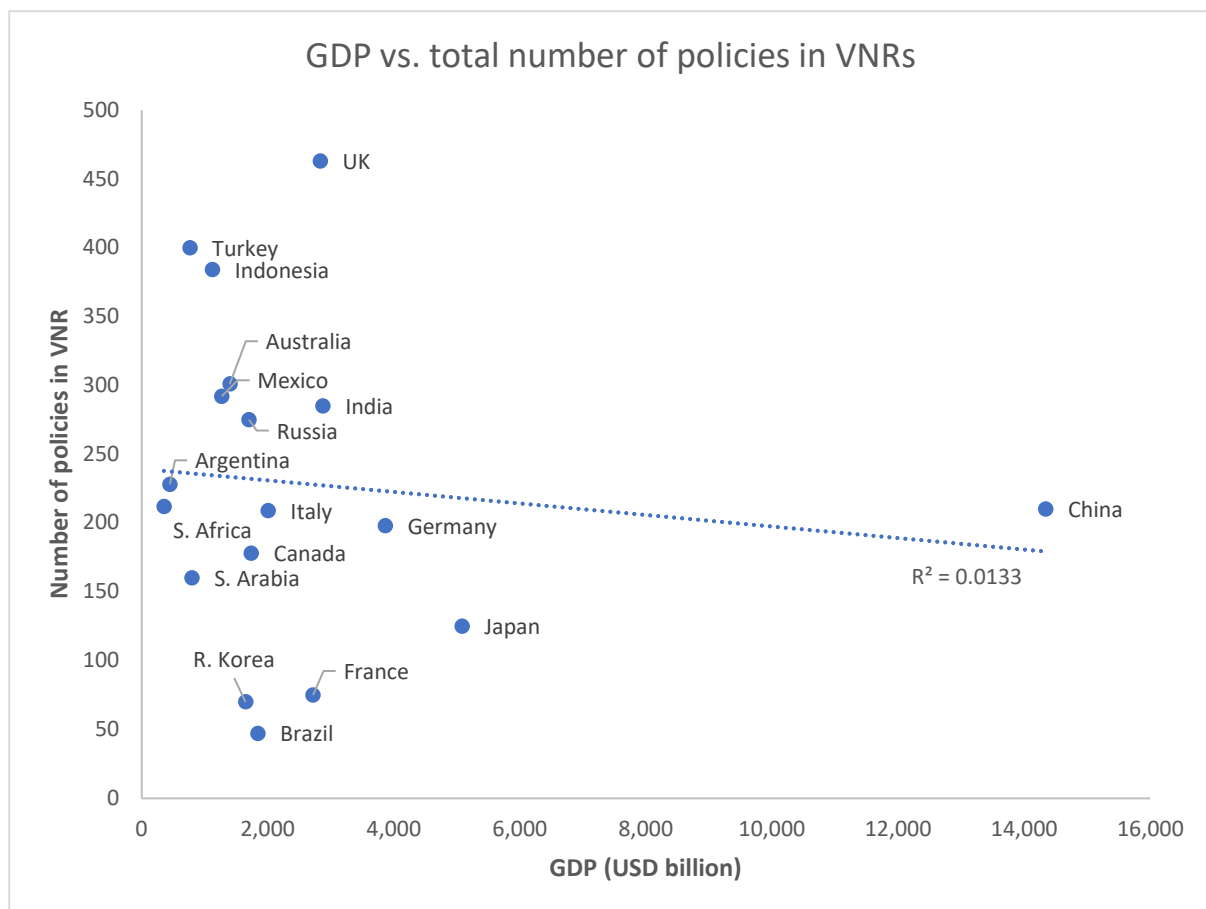


Figure 2. GDP vs. total number of policies in VNRs. Source: GDP data—World Bank.

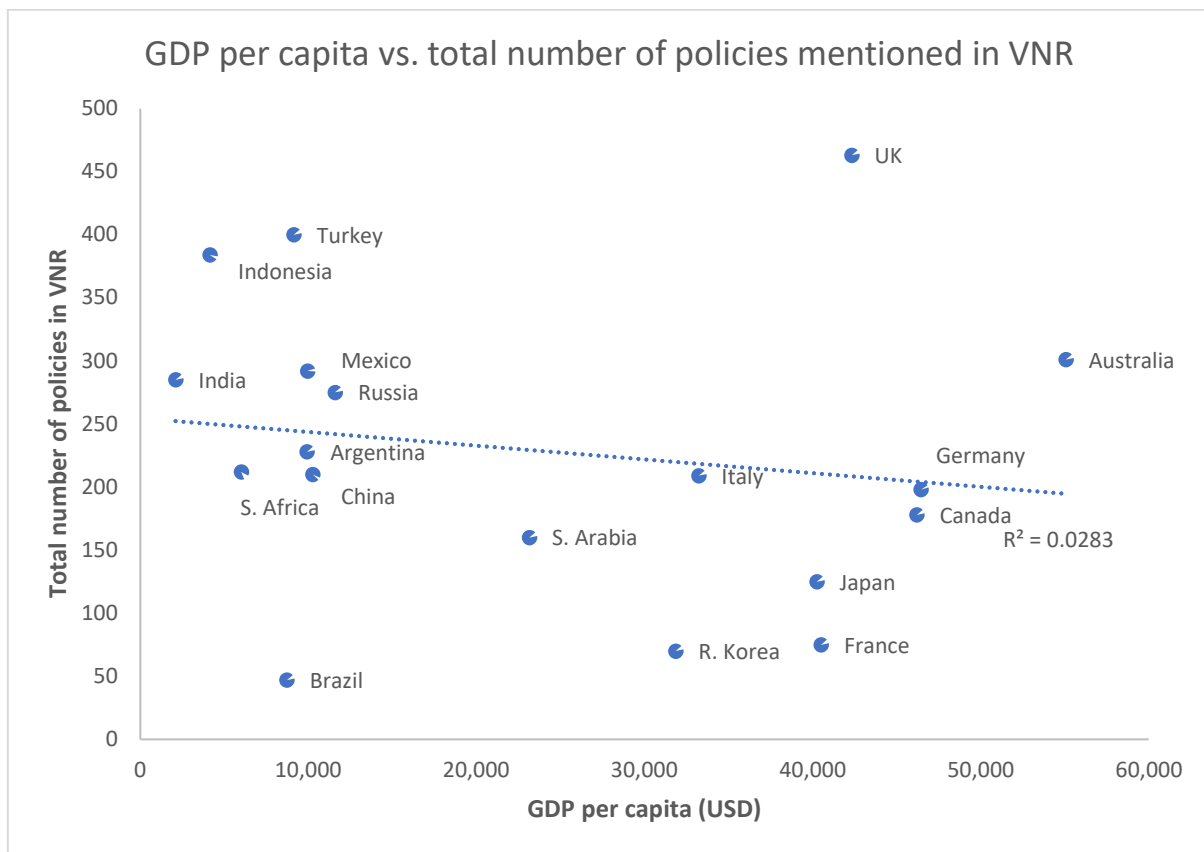


Figure 3. GDP per capita vs. total number of policies in VNRs. Source: GDP per capita data—World Bank.

3.5. Comparison of the Distribution of Policies and Budgets among SDGs between Developed and Developing Countries

It may be hypothesized that developed and developing countries would prioritize different SDGs. However, the evidence from this study does not support this idea. Figure 4 compares the distribution of policies among SDGs by developed and developing G20 countries based on the UN’s country classification [53]. The results show basically small differences in the share of policies applicable to each SDG. The largest difference was that developed countries’ VNRs contain roughly 4% more policies related to SDG 8 than developing countries. Developing countries’ VNRs contained over 3% more policies for SDGs 2 and 3 than developed countries (3.3% and 3.4%, respectively). Developing countries also had slightly more policies for SDGs 1, 4, 5, 7, 13, 14, 16 and 17, while developed countries had slightly more policies under SDGs 6, 9, 10, 11, 12 and 15 in addition to 8. Perhaps unexpectedly, developed countries devoted a higher share of policies to the “economic” SDGs 8 and 9, while developing countries devoted a slightly higher share of policies to “environmental” SDGs 13 and 14. In the SDG negotiations, developing countries pushed for a headline goal on sustainable consumption and production (SDG 12) [54], but the G20 developed countries’ VNRs included a slightly higher percentage of policies on it.

3.6. Policy Types

This study also analyzed the types of policies listed in the VNRs, as the significance of simply looking at the number of policies is limited. The analysis sought to examine to what extent the policies were substantial, such as laws, regulations, financing, etc., and to what extent they may have been smaller-scale programs or projects. The list of policy types, developed inductively, is explained in the methodology section above. The distribution of policy types by country is shown in Table 13.

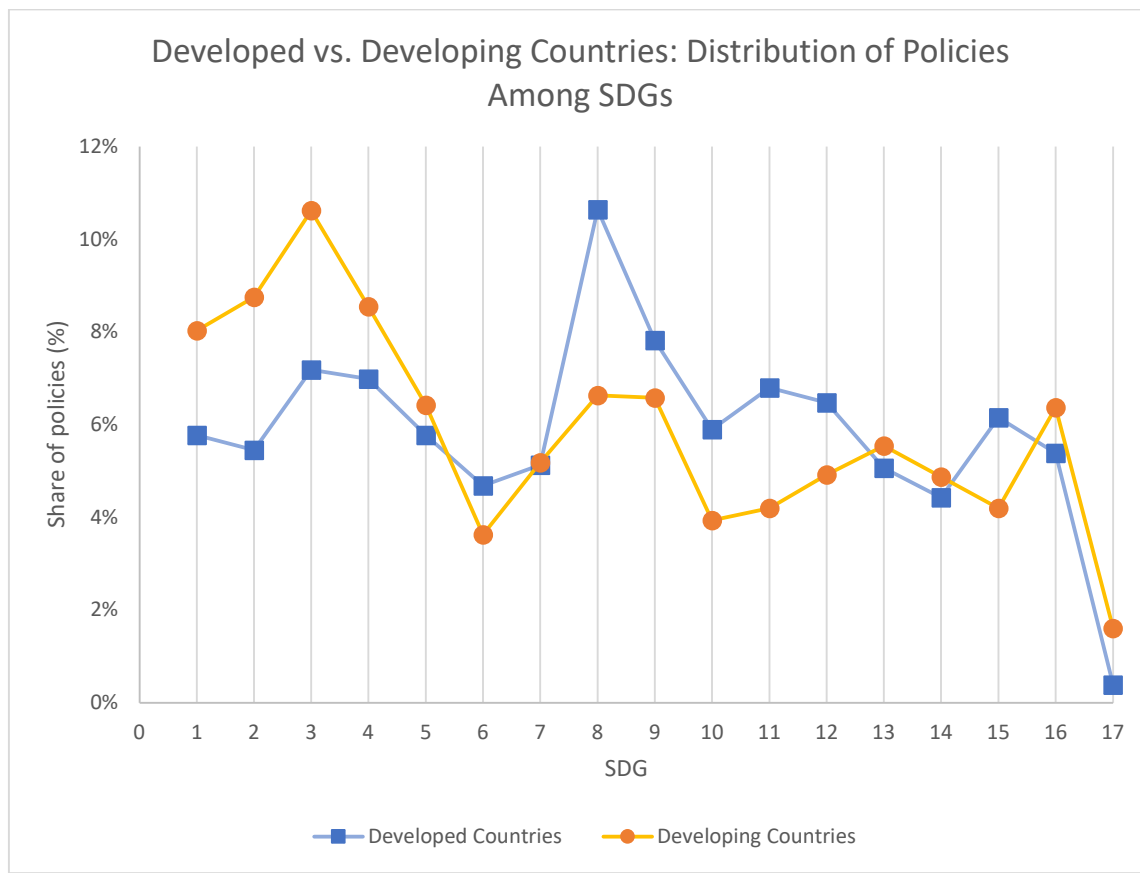


Figure 4. Developed vs. developing countries: distribution of policies among SDGs.

The results showed that about 16.5 percent were projects or programs. Policies related to information, which may be less ambitious than other types of policies, accounted for only another 8 percent.

In contrast, more substantial policy types accounted for a much larger share of policies. Strategies and action plans plus national policies were by far the most common policy types, accounting for over 27 percent of all G20 policies, while laws and regulations were the second most common type at over 16 percent. Some of these strategies might not be very substantial, but many of them have multiple components which would increase their cumulative significance. Other substantial policy types were taxes and spending (over 7 percent), financing and actual infrastructure (over 4 percent), and protected areas (1 percent). Moreover, strategies and action plans were the most common policy type in 11 of 18 countries, and either the second or third most common type in the other countries, except Indonesia, while laws and regulations were the first or second most common policy type in 14 of the 18 countries.

Therefore, almost 66 percent, about two-thirds, of the policies can be considered substantial, while only about 25 percent may be considered less substantial, and less than 10 percent are classified as other. There are some limitations to this analysis due to the limited information about the policies. It is possible that some projects or programs may be in fact be quite substantial, while some laws, regulations, strategies, and budgets may be less substantial. Still, many of the strategies and action plans, especially in developing countries, were core national development strategies, or climate strategies, for example, with many components covering a wide range of policy areas and SDGs. There may also be overlaps between the categories. Some laws are general and mandate the development of implementation strategies and the allocation of budgets. Some laws include enforcement mechanisms and some do not. Some strategies may include projects and information sharing measures.

Table 13. Distribution of policy types by country.

Type	Argentina	Australia	Brazil	Canada	China	France	Germany	India	Indonesia	Italy	Japan	Mexico	R. Korea	Russia	S. Arabia	S. Africa	Turkey	UK	Total	Percent
1. Major Laws, Policies, Strategies, Enforcement																				
LR	14	27	7	23	40	19	44	52	112	4	37	74	2	44	9	42	48	78	676	16.4
NP	1	8	4	2	0	3	9	15	32	0	6	4	0	9	0	16	3	9	121	2.9
SA	69	108	6	58	32	15	54	56	26	137	33	48	68	59	23	56	147	126	1121	27.3
EN	0	1	0	1	19	0	1	0	2	0	1	0	0	2	3	0	2	1	33	0.8
2. Money-related Policies																				
TS	31	9	6	18	18	8	21	32	54	4	10	6	0	11	6	13	10	39	297	7.2
PR	1	0	0	0	0	2	0	1	1	0	0	2	0	1	0	0	3	6	17	0.4
FN	8	12	0	12	7	4	5	9	14	36	1	15	0	8	2	1	7	36	177	4.3
3. Physical Infrastructure, Land Management																				
IN	10	9	2	8	15	0	2	19	17	1	2	18	0	21	18	10	20	13	185	4.5
PA	3	4	0	0	6	2	2	4	1	0	0	4	0	5	0	4	4	2	41	1.0
FR	1	3	0	0	7	0	0	7	0	0	1	4	0	7	1	0	1	3	35	0.9
4. Projects, Programs																				
PJ	6	2	1	0	6	0	3	1	3	1	5	1	0	26	4	3	27	3	92	2.2
PG	47	56	15	20	11	7	21	48	54	12	7	65	0	30	31	38	41	84	587	14.3
5. Information-related Policies																				
MO	3	1	1	3	6	1	0	6	2	0	1	2	0	5	3	3	10	2	49	1.2
AR	0	1	0	2	3	2	4	2	4	0	4	2	0	2	8	3	3	6	46	1.1
TR	14	5	0	3	11	1	4	5	18	0	3	4	0	5	11	1	7	8	100	2.4
ID	1	10	0	2	3	1	1	3	4	2	3	8	0	9	8	3	8	9	75	1.8
CR	3	3	0	0	0	2	3	3	4	0	1	5	0	3	2	0	4	2	35	0.9
RJ	1	0	0	0	2	1	0	4	9	1	0	2	0	3	0	1	1	1	26	0.6
6. Other																				
RS	1	5	0	4	4	1	15	2	1	4	0	0	0	6	3	7	6	2	61	1.5
AG	1	1	0	2	0	0	1	4	1	0	0	0	0	1	4	0	5	0	20	0.5
OT	12	36	5	20	20	6	8	12	25	7	10	28	0	18	24	11	43	33	318	7.7
Total	228	301	47	178	210	75	198	285	384	209	125	292	70	275	160	212	400	463	4112	100

Source: coded by authors based on policies compiled from VNRs [16,25].

Nevertheless, these results suggest that the G20 countries' SDG implementation efforts are serious, not just small projects, and moreover, their overall policy and budget efforts are probably significantly underestimated since most of each country's policies and budgets are somehow related to SDGs, but not all of them were included in the VNRs.

The large number of laws, regulations, and other relatively strong policies listed in the countries' VNRs contradicts the common idea that most governments are reluctant to use these traditional major policy instruments to address major sustainability issues, and instead favor weaker policies such as voluntary actions, public awareness, and possibly research to further study these issues. Moreover, countries also included some tax and spending-related policies, indicating that domestic funding is available, even in developing countries.

3.7. Policy Dates

This section explores the extent to which policies reported in the VNRs already existed before the SDGs or whether they were adopted after the start of the SDGs. It is not easy to accurately determine a policy's starting date, even when a date was indicated in the VNR, for several reasons. First, the concept of date, or when a policy is initiated or adopted, has different interpretations. Dates could refer to various stages in the policymaking and implementation process, which are different in each country and so are not very comparable. Some dates may refer to an informal decision by a key political process, but other dates may relate to a later stage in which the decision is formalized. Some policies do not go into effect until sometime after a decision is formalized. It is often difficult to detect cases where a policy changes its name but not the substance, or the substance is partially changed but not the name. Many policies did not mention any dates, and even when a date was mentioned, it was often not possible to obtain enough information to understand its precise legal meaning. Therefore, this study simply tracked whether or not a date was mentioned.

This procedure generated an approximate view of how countries indicated policy dates in the VNRs. Figure 5 shows that most G20 countries (16) listed at least some dates for some policies. However, in most countries, less than half of the policies mentioned a date. Indonesia and Germany listed the highest percentage of policies with dates, 68% and 66%, respectively. Five countries indicated dates on between 5 and 20 percent of their reported policies.

On average, the G20 developed countries indicated a somewhat larger share of policies with dates compared to the developing countries (35.9 percent vs. 25.2 percent). Still there were some exceptions, as Indonesia and South Africa listed a larger percent of policies with dates than the average G20 developed country, while Australia listed a smaller percent of policies with dates compared to the average G20 developing country.

Most of the policies which included a date were from 2015 or later (Figure 6), while less than half of the policies mentioned dates of 2013 and earlier. It is possible that some policies with dates of 2014 or 2015 could have been influenced or partially motivated by the negotiations leading up to the SDGs, as the global negotiations were quite advanced by that time, but this is not necessarily the case. Given that policies often take at least one or two years to adopt, it would have been difficult for VNRs produced in 2016 or 2017 to mention many policies adopted later than 2014 or 2015. Still, just because a policy was adopted after the SDGs or directly addresses SDGs does not mean that it was actually motivated by the SDGs.

How should the information on policy dates be interpreted? SDGs were intended to encourage countries to strengthen their efforts on sustainable development and motivate the development of new policies. Therefore, if a large share of policies mentioned in a country's VNRs were adopted before 2015, it could indicate that the country is making insufficient efforts. However, this interpretation may not necessarily be reasonable. In fact, issues addressed by the SDGs are not new, and most countries already had policies on most or all SDG topics before anyone thought of SDGs. This means that the policies existing before the SDGs contributed to countries' levels of achievement at the start of the

SDGs. Certainly, the SDGs were intended to encourage additional efforts to accelerate progress. But pre-existing policies may still promote additional progress, and maintaining existing policies may be necessary to prevent regression. Therefore, it is reasonable to include pre-existing policies in the analysis of countries' policy efforts to achieve the SDGs.

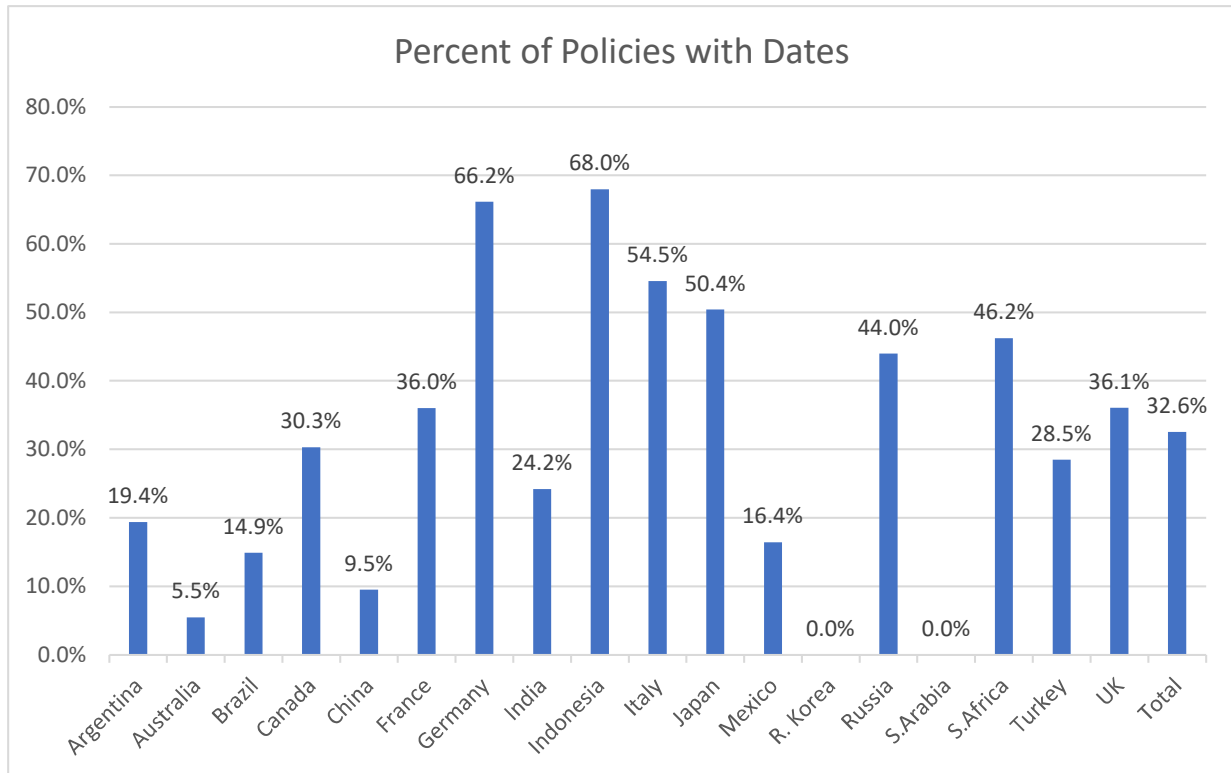


Figure 5. Percent of policies with dates. Note: Argentina's 2017 VNR was excluded.

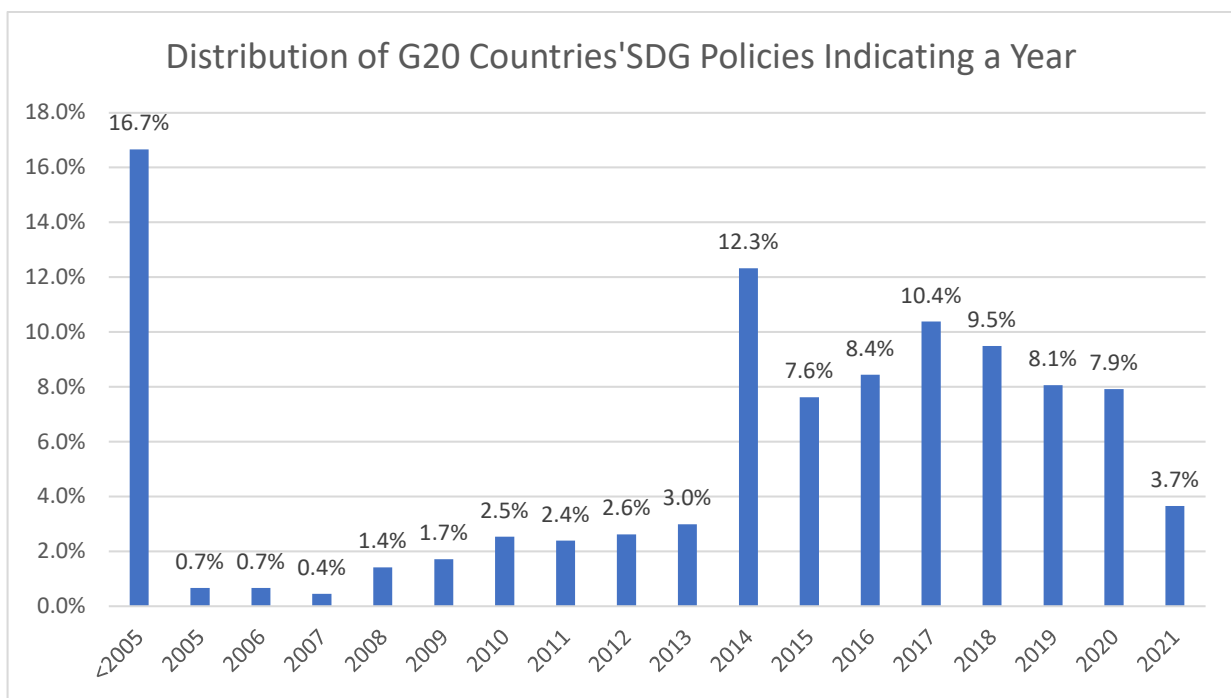


Figure 6. Distribution of G20 countries' SDG policies indicating a year. Notes: (a) this figure includes repeated policies; (b) Argentina's 2017 VNR was excluded.

3.8. Budgets

The overall status of reporting on budgets for domestic SDG implementation was summarized in Table 3 above. Detailed SDG budget allocations of each country as reported in their VNRs and their allocation by SDG are shown below in Table 14 for countries that organized their VNRs by SDG. Table 15 shows the SDG budget amounts reported by countries that did not organize their VNRs by SDG, and compiles the total budget amounts listed by the G20 countries.

The total domestic SDG implementation spending indicated in the G20 countries' VNRs was over USD 2.7 trillion. Perhaps surprisingly, developing countries accounted for over USD 1.8 trillion of this amount, over two thirds. India's USD 689.2 billion was by far the largest amount, about one-quarter of the total, while Canada's USD 364.9 billion was the second largest. Five of the top seven were developing countries.

Regarding the distribution of budgets among SDGs (within the total amount allocated to specific SDGs), Table 14 shows that G20 countries listed the largest amounts under SDG 1, no poverty, in the VNRs, nearly one-third of the amount. The second highest amount, 17.3%, was for SDG 9 on industry, innovation and infrastructure. In contrast, the major environmental SDGs, 12, 13, 14, and 15 (responsible consumption and production, climate action, life below water, and life on land, respectively) accounted for the lowest share, with these four SDGs accounting for just 1.4 percent. SDGs 2 and 5 were the next lowest with 0.8 percent each. The reason for this prioritization is not clear. On one hand, it could suggest that SDGs 1 and 9 were prioritized or that they are inherently more costly goals to achieve, relative to the other SDGs. On the other hand, since the VNRs clearly omit significant amounts of SDG spending, the overall budget information in the VNRs probably does not have much significance.

The significance of data on the actual spending levels is also very limited, because the reported budget information is generally selective and not very systematic, and there is a wide range of reporting styles. The data are also not very comparable, especially relating to the time period. Different budget amounts were for different years, and some span more than one year. For example, Argentina's VNR from 2020 reported the total spending for each SDG for four years (2016–2019) [37]. Thus, Argentina's spending totals are considerably higher than the other countries, but this is largely due to their comprehensive reporting style relative to other countries' VNRs.

There are also many reporting gaps. Only five G20 countries reported budget amounts for more than half (9 or more) of the SDGs, while six countries reported budget amounts for 5–8 SDGs. Table 13 has 255 country–SDG pairings (15 countries \times 17 SDGs), and only 121—less than half—have a budget amount. Of these budget amounts, 39 (about one-fourth) are less than USD 1 bil. The table also shows that the biggest gaps are SDGs 10 and 12–15, with few countries listing budgets for them. In contrast, most countries reported budget amounts for SDGs 1, 3, and 9.

It can be concluded that G20 spending on SDGs is very substantial—approaching USD 3 trillion—despite the data's many limitations. Moreover, the budgets in the VNRs are probably only a fraction of the actual total SDG spending. First, countries reported a much greater range of policies than budgets as can be seen by comparing Tables 5 and 14. Presumably, many of these policies have associated budgets, which were mostly not reported in the VNRs. Second, considering Table 14, it is evident that most countries have budgets for areas that are blank in the table, particularly relating to agriculture (SDG 2), health (SDG 3), education (SDG 4), energy (SDG 7) and economic growth (SDG 8). And even for the SDGs with the most reported spending, SDGs 1 and 9, these also seem under-reported, with some countries neglecting to list pensions for senior citizens or regular transport infrastructure spending, for example. Overall, most policies are somehow related to SDGs, and therefore most government spending is similarly related to SDGs. However, most countries, including developing countries, have a large number of policies, so it is probably not possible or feasible to list them all in countries' VNRs. Therefore, under-reporting of policies as well as budgets may be difficult to avoid.

Table 14. Comparison of budget amounts allocated to specific SDGs.

SDG	Argentina (2020)	Australia (2018)	Brazil (2017)	Canada (2018)	France (2016)	Germany (Total)	India (Total)	Indonesia (Total)	Mexico (2018)	Russia (2020)	Saudi Arabia (2018)	South Africa (2019)	Turkey (2019)	UK (2019)	SDG Total	SDG %
1	190.5	7.4	104.3	42.2	7.4		238.0	28.0			34.2	14.0	39.8	18.2	724.0	32.6
2	5.4		0.8	3.0				6.5		0.0		0.3	1.8	0.1	17.9	0.8
3	3.0		0.0	12.0	0.4		4.0			1.5	39.2	0.6	46.1	0.5	107.3	4.8
4	3.7			3.1		0.9		0.6		9.1	51.0	7.9	77.4	0.1	153.8	6.9
5	16.3				0.1	0.2					0.7	0.0		0.1	17.4	0.8
6	3.4			13.9	0.5					4.4		1.2	65.7	52.3	141.4	6.4
7	1.2	4.3			0.4		7.9		0.1			0.7		115.9	130.5	5.9
8	1.5			2.0	24.3			75.1				2.8	10.6	0.0	116.3	5.2
9	16.8	3.7	0.1	204.6	52.6	5.4	25.4	8.5		8.2	26.8	6.4		24.0	383.5	17.3
10	7.1			2.0								14*	38.6	0.0	47.7	2.2
11	25.1			73.1	44.8	0.9	26.7					4.7	14.3	24.9	214.5	9.7
12	0.1			3.0						0.0		0.1			3.2	0.1
13	0.1	1.9						2.9				0.1		9.2	14.2	0.6
14	0.0	0.4		1.5								0.3			2.2	0.1
15	0.1			4.3								0.3	0.0	7.8	12.6	0.6
16	7.4			0.1								15.7		0.0	23.2	1.0
17	0.8			0.1				28.9				5.8	9.0		44.6	2.0
Other											64.0				64.0	2.9
Total	282.5	17.7	105.2	364.9	130.5	7.4	302.0	150.5	0.	23.2	215.9	60.9	303.3	253.1	2217.3	
%	12.7	0.8	4.7	16.5	5.9	0.3	13.6	6.8	0.0	1.0	9.7	2.7	13.7	11.4		

Sources: VNRs [16,25]. Unit: USD billion. Notes: China indicated specific amounts for SDGs 1 and 3, but the currency unit was not specified in its VNR, so China could not be included in this table [39]. Budget figures do not represent a specific time period. Some are for one year, others for multiple years.

Table 15. Total budget amounts reported in G20 VNRs.

Country/Group	Budget (USD Billion)
Countries reporting each SDG	2217.3
Argentina (2017)	49.2
Italy (2017)	106.4
India (2020) *	387.2
Japan (2021)	22.6
Total	2783

Source: VNRs and [16]. * India's 2020 VNR included some budget amounts which were not allocated to specific SDGs. Therefore, the total amount reported on India's 2 VNRs, combining the amounts from Tables 14 and 15, was USD 689.2 billion. Notes: USD conversions are based on September 2021 rates. Budget figures do not represent a specific time period. Some are for one year while others are for multiple years, etc. China's VNR included some budget amounts, but the currency unit was not indicated, so it could not be included in the total [39].

The cumulative total amount of spending reported in the VNRs is more than double the amount that was reported in the G20's VNRs as of 2018, which was just above USD 1 trillion (Elder and Bartalini 2019). This does not necessarily mean that G20's actual spending on SDGs was increasing, but it could be that more of the spending was included in the VNRs.

In sum, the budget information presented in the G20 countries' VNRs substantially understates their actual SDG spending. Instead, this information may be mainly related to specific activities or directions that each country wanted to highlight for global and national audiences.

4. Conclusions

This study found that the G20 countries collectively reported over 4100 policies in their VNRs including over 530 policies which were listed under more than one SDG, and over USD 2.7 trillion in domestic SDG spending. The number of policies generally increased as countries submitted second or third VNRs. Overall, these policies were widely distributed among SDGs, with somewhat more listed under SDGs 3, 4, and 8, while somewhat fewer were listed under SDGs 6, 10, and 14. About 65 percent of the policies appeared to be substantive, including national strategies, action plans and policies; laws and regulations; enforcement, and finance-related policies such as taxes, government spending, and financing mechanisms; actual infrastructure; and protected areas. Projects and programs accounted for only about 16.5 percent of the policies, and some of these may also be substantial. Information related policies including public awareness, training, etc. accounted for only 8 percent. It is difficult to tell how many policies are new, since reporting of policy dates was incomplete and fragmentary; most countries listed dates for some policies, but only four countries listed dates for more than half of their policies. Most of the policies with dates are after 2015; less than half are earlier.

Although there were major differences between individual countries, cumulatively, there were few major differences between developed and developing G20 countries regarding the policies. Differences regarding the distribution of policies among SDGs were also not very large. Moreover, in some cases, differences were in the opposite of the expected direction; for example, some developing countries listed more policies and budgets than some developed countries, and some developed countries listed a greater share of policies on SDGs 8 and 9, while some developing countries listed a greater share of policies for SDGs 13 and 14.

The G20 countries also cumulatively reported a significant amount of domestic SDG implementation spending in their VNRs, totaling over USD 2.7 trillion, despite the incomplete and fragmentary reporting. Over 32 percent of spending allocated to specific SDGs was related to SDG 1, and the second largest amount was for SDG 9, while the lowest amounts were for SDGs 2, 5, and 12–15. Over two-thirds of the total amount of spending was reported by developing countries. Developed countries indicated policy dates for a somewhat greater percent of their policies than the developing countries.

The overall conclusion is that according to the VNRs, the G20 countries were making significant policy and budget efforts to implement the SDGs. Moreover, both policies and budgets appear to be under-reported. Countries clearly had budgets for many of the policies they listed in their VNRs, but in many cases, the related budgets were not indicated. Many policies appear to have been adopted or implemented around the time of the start of the SDGs or later, while others were in force before the SDGs. This paper argues that it is not unreasonable to consider older policies, since they contributed to countries' existing levels of achievement, and continuing or strengthening them will contribute to future achievement.

A key implication is that the current policies and budgets are clearly not sufficient, and more effort is needed, even though efforts as of 2022 may have been more substantial than expected, since the SDGs are not on track, including in the G20. There could be two main interpretations of this based on the information in this study. First, the policies might not be ambitious enough or sufficiently effective or aligned with the targets. Second, the policies might be appropriate in principle, but not sufficiently implemented, and more funding, capacity, and/or enforcement may be needed.

There are two main implications for future research. First, more detailed research on specific policy areas such as environment or health is desirable [17]. This study's dataset could be used to identify an initial list of policies in a particular area that were listed in countries' VNRs, including relevant policies which may be listed under more than one SDG. This exercise could suggest whether countries are lacking policies to address key targets, or whether countries may have overlooked including them in the VNRs. Second, there should be more monitoring of policy implementation and effectiveness in order to make concrete recommendations for specific countries. Using quantitative indicators to compare broad global policy trends is useful but does not lead to specific recommendations. It is not easy to obtain information on policies of specific countries, so it is hoped that the dataset produced by this study could be a useful starting point.

For VNRs, the major implication is that review of individual national VNRs by stakeholders and others should focus more on assessing each country's policy efforts and budgets. The G20 governments included many policies, projects, and actions in their VNRs. Stakeholders in each country would be able to access more detailed policy information in the original language beyond what is concisely presented in the VNRs. Reviews should focus more on whether these policies are appropriate, sufficiently ambitious and transformative, how well they are being implemented, and whether additional policies are needed. Reviews should also focus more on specific sectors. This kind of review is much more complex and would involve considerable effort compared to existing reviews of VNRs. Nevertheless, there is a need to move beyond examining VNR preparation procedures and whether they mention particular topics.

This study had several limitations. First, the number of policies is not a good indicator of effort, but identifying, compiling, and counting them is necessary as a first step in analyzing specific policies, and their large number indicates at least some amount of effort, which needs to be recognized. Moreover, the analysis of policy types offsets this limitation to some extent, and a significant majority of the policies appeared substantial. Second, the study identified many data gaps in the VNRs, especially regarding budgets and policy implementation dates. However, this study obtained useful results despite these gaps. Moreover, the data gaps indicated that in fact, G20 policies and budgets were understated in their VNRs. Third, this study was not able to use country-specific sources to check the information reported in the VNRs, so the interpretation might not necessarily be accurate in some cases. Therefore, this study may have overlooked or misinterpreted some policies, or misjudged the degree of concreteness of some policies, leading to possible over- or under-counting. Finally, this study was not able to examine the extent or effectiveness of these policies' implementation; these are important areas for future research.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/su152215733/s1>, Microsoft Excel Workbook: Dataset of SDG Policies of G20 Countries as Reported in their VNRs; Table S1: Budget allocations mentioned in Argentina’s 2020 VNR classified by SDG; Table S2: Budget allocations mentioned in Argentina’s 2017 VNR classified by its own organization system; Table S3: Budget allocations mentioned in Australia’s 2018 VNR classified by SDG; Table S4: Budget allocations mentioned in Brazil’s 2017 VNR classified by SDG; Table S5: Budget allocations mentioned in Canada’s 2018 VNR classified by SDG; Table S6: Budget allocations mentioned in China’s 2021 VNR classified by SDG; Table S7: Budget allocations mentioned in France’s 2016 VNR classified by SDG; Table S8: Budget allocations mentioned in Germany’s 2021 VNR classified by SDG; Table S9: Budget allocations mentioned in Germany’s 2016 VNR classified by SDG; Table S10: Budget allocations mentioned in India’s 2017 VNR classified by SDG; Table S11: Budget allocations mentioned in India’s 2020 VNR classified by SDG; Table S12: Budget allocations mentioned in Indonesia’s 2021 VNR classified by SDG; Table S13: Budget allocations mentioned in Italy’s VNR classified by its own organization system; Table S14: Budget allocations mentioned in Japan’s 2021 VNR classified by its own organization system; Table S15: Budget Allocations mentioned in Mexico’s 2018 VNR classified by SDG; Table S16: Budget allocations mentioned in Russia’s 2020 VNR classified by SDG; Table S17: Budget allocations mentioned in Saudi Arabia’s 2018 VNR classified by SDG; Table S18: Budget allocations mentioned in South Africa’s 2019 VNR classified by SDG; Table S19: Budget allocations mentioned in Turkey’s 2019 VNR classified by SDG; Table S20: Budget allocations mentioned in the United Kingdom’s 2019 VNR. References used in the Supplementary Materials: [16,26–52].

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