DISCLOSURE INSIGHT ACTION

Corporate Renewable Electricity Sourcing Trends

2024 Snapshot

November 2024

Contents

Key findings

9,551 companies representing 3,571 terawatt-hours (TWh) of annual electricity purchasing (or nearly 13% of global electricity generation) report on their electricity purchasing and location-based Scope 2 emissions through CDP.

A subset of only 7% of these companies accounts for more than 76% of the electricity purchasing represented by the entire group.

These companies currently claim, on average, to be purchasing 29% renewable electricity (RE), below the current global average of renewable resources in electricity generation

Only 936 companies (10% of companies studied), representing 647 TWh of annual electricity purchasing, set targets to consume 100% RE, and choose a MWh-weighted average target year of 2033.

Companies with these targets currently claim to be using 53% RE. 75% of the electricity purchasing studied in this report is from companies that set no targets to increase their RE purchasing. This ambition is insufficiently aligned with UNFCCC goals to triple RE capacity globally by 2030. Similarly, under 5% of companies studied declared having an energy efficiency target, which is insufficiently aligned with UNFCCC goals to double the rate of annual energy efficiency improvements by 2030.

While companies claim to be purchasing 29% RE, companies only disclose in sufficient detail for CDP to recognize 16% RE.

Many companies, whether or not they make RE claims, fail to disclose market-based Scope 2 emissions.

Many companies that do disclose market-based Scope 2 emissions fail to have those disclosures verified by a third party.

Power purchase agreements (PPAs) deliver 34% of the RE purchasing studied across a subset of 4,595 companies providing more transparent detail on their RE claims.

However, these agreements are overwhelmingly concentrated in a small number of the largest electricity users studied in this report. The modal method for purchasing RE is through a contract with an electricity supplier.

Introduction

This report studies a group of

9,551

companies reporting to CDP in 2023 on their electricity and RE purchasing accounting for nearly

13%

global electricity generation

Power generation is the single largest source of CO_2 emissions globally; yet is decarbonizing faster than any other sector. Electricity is foundational to a world with net-zero greenhouse gas (GHG) emissions: it will replace all existing uses of fossil fuels in processes that could instead be electrified using grids powered by low-carbon and renewable resources.

Commercial and industrial electricity users account for over half of global electricity consumption. Their decisions to voluntarily purchase renewable electricity (RE) play an important role in the energy transition. Some electricity users are directly responsible for the construction of new RE projects where they sign long-term physical or virtual power purchase agreements (PPAs). However, these agreements are generally inaccessible to most companies, who instead purchase RE through their energy suppliers or by purchasing unbundled energy attribute certificates (EACs). These users send signals for more RE production through their collective demand. The strength of this signal is fundamentally dependent on the balance between supply of and demand for RE.

This report studies a group of 9,551 companies reporting through CDP in 2023 on their electricity and RE purchasing. In aggregate, they account for 3,571 TWh of electricity purchasing; nearly 13% of global electricity generation, or more than India's electricity consumption (but less than the United States' or China's). This group contains some of the single largest corporate electricity users in the world, some of which purchase upwards of 60 TWh of electricity annually.

The companies studied in this report claim to purchase nearly 1,031 TWh of RE annually (29% RE). In an attempt to standardize and understand the credibility of these claims, this report uses concepts of 'reported' and 'recognized' claims based on the transparency and completeness of disclosures. At least 569 TWh of RE purchasing (16% RE) includes sufficient detail to understand the mechanism through which it was purchased and where it was consumed and is therefore 'recognized' by CDP.

Sample Details

More than 23,000 companies responded to the CDP 2023 Climate Change Questionnaire. This report presents broad analysis of a set of 9,551 of these companies reporting on both their location-based Scope 2 emissions and their electricity purchasing (minimum disclosures used to qualify their data for use in this report). These companies represent 3,571 TWh of electricity purchasing.

Two subsets are also important to this report, containing companies giving more detail in their responses.

1 **The first subset** contains 4,595 companies (representing 2,710 TWh of electricity purchasing) that provided at least some detail on: (1) the countries/areas where RE was purchased, and (2) the mechanisms used to purchase RE (eg contracts with electricity suppliers, unbundled energy attribute certificate (EAC) purchases, or power purchase agreements (PPAs) as examples).

2 **The second subset** contains 3,195 companies (representing 1,824 TWh of electricity purchasing) that additionally disclosed at least some geographic breakdown of all their electricity purchasing.

These sets allow for the following depth of analysis:

Across all companies studied in this report, electricity purchasing and general RE claims can be studied at the sector level.

9,551 companies

Across the first subset, detailed purchased RE claims can be studied at the market and sector level.

4,595 companies

Across the second subset, electricity purchasing, detailed RE claims, and a percentage of purchased RE use (% RE) can be studied at the market and sector level.

3,195 companies

Figures throughout this report are labelled with 'n=' to identify which of the above samples they represent.

Electricity purchasing

Electricity purchasing

By industry/sector

Over 70% of the companies studied consume below 100 GWh (1000 GWh = 1 TWh) of purchased electricity in a year. As a reference, the RE100 initiative (a global RE procurement initiative for large electricity users) considers 100 GWh in annual electricity consumption its membership threshold. These 6,777 companies in total account for roughly 127 TWh of the 3,571 TWh of electricity purchasing studied in this report, while the 2,774 companies purchasing more than 100 GWh of electricity annually account for 3,444 TWh in aggregate.

The 'super users' studied in this report include the 682 companies with 1 TWh or more annual electricity purchasing. The super users account for 2,728 TWh of electricity purchasing (in other words, 7% of the companies account for 76% of the electricity purchasing).

Figure 1: All-industry annual electricity purchasing (TWh) (n=9,551)

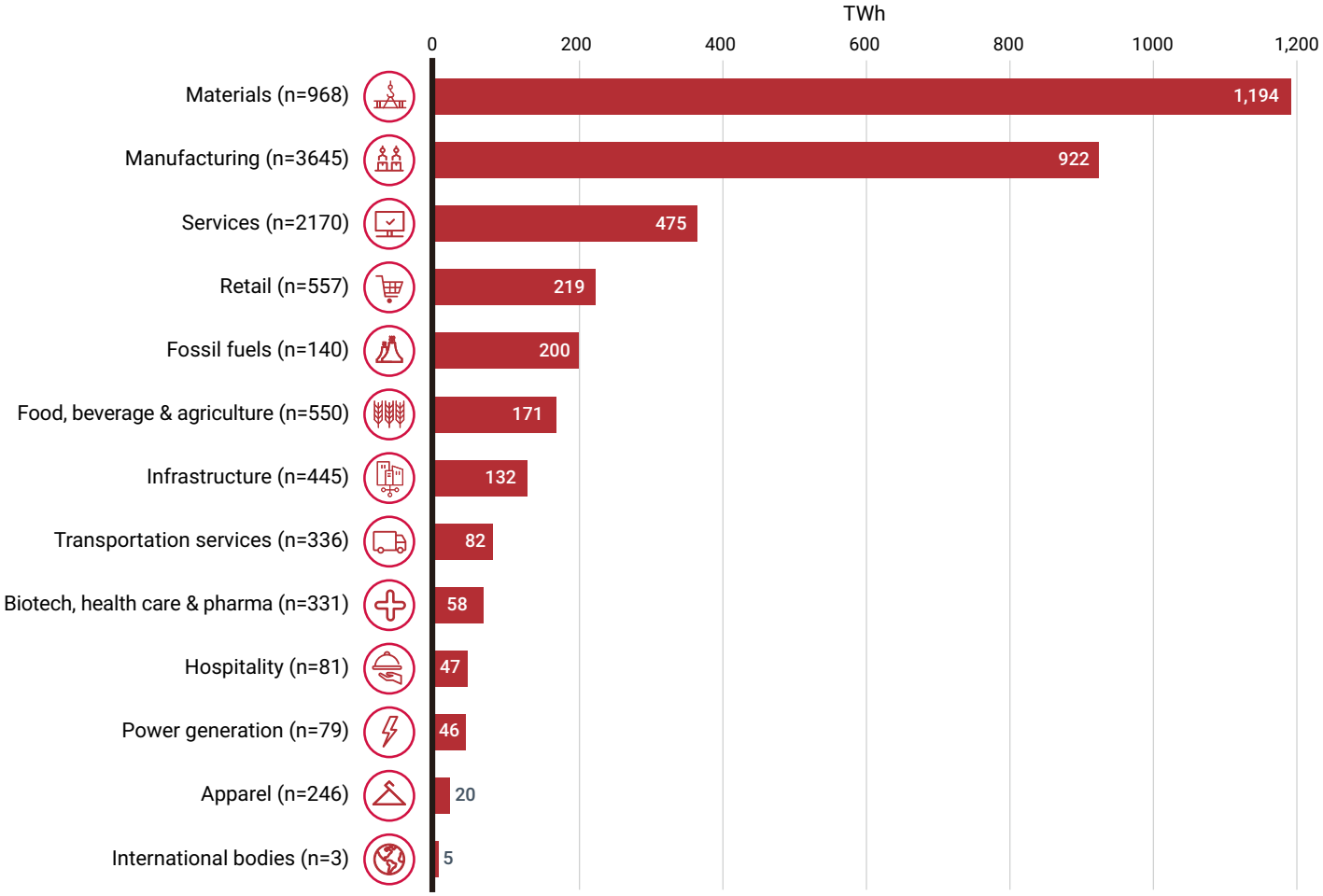


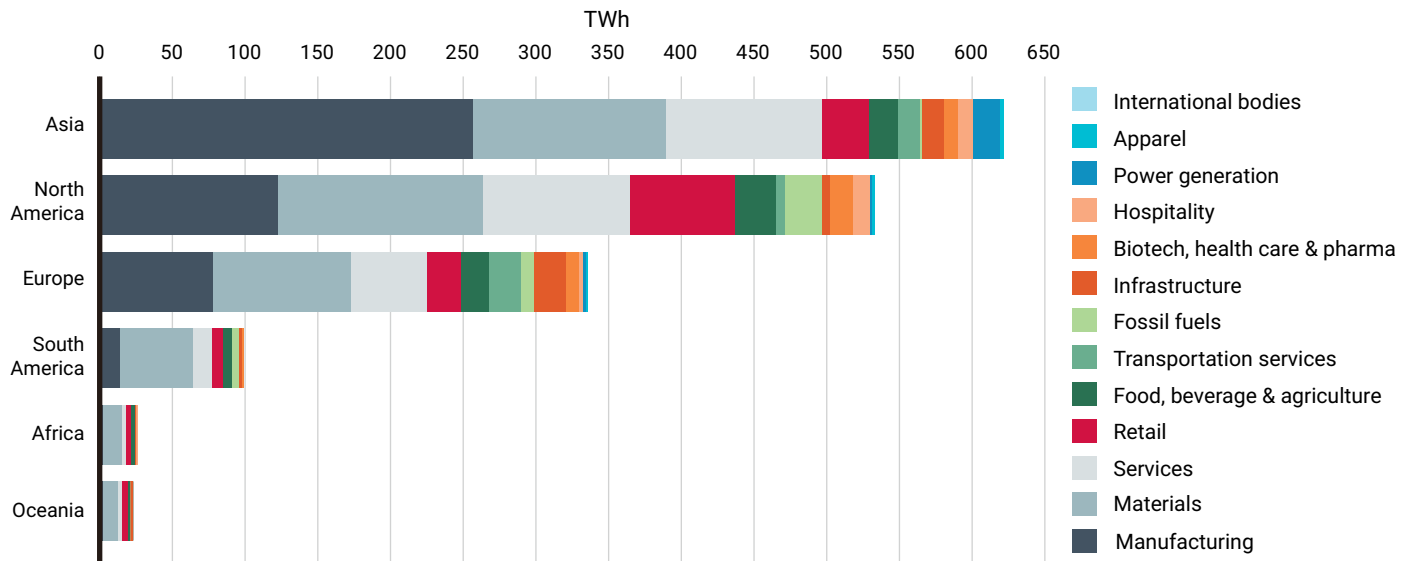
Table 1: All-industry annual electricity purchasing, banded (n=9,551)

Industry	Count of companies						
	10 TWh or over	5-10 TWh	1-5 TWh	500-1000 GWh	100-500 GWh	1-100 GWh	Less than 1 GWh
Apparel	-	-	3	8	30	150	55
Biotech, health care & pharma	-	-	14	20	73	194	30
Food, beverage & agriculture	-	6	30	50	140	289	35
Fossil fuels	5	6	30	11	19	50	19
Hospitality	-	2	8	8	26	35	2
Infrastructure	2	2	22	31	108	199	81
International bodies	-	-	1	-	1	-	1
Manufacturing	5	26	171	155	572	2,333	383
Materials	24	33	140	93	189	412	77
Power generation	2	-	4	3	17	46	7
Retail	1	4	48	35	98	250	121
Services	9	7	62	50	290	1,176	576
Transportation services	-	4	11	14	51	177	79
Total	**48**	**90**	**544**	**478**	**1,614**	**5,311**	**1,466**

By region

It is important to note that in the group of 3,195 companies including at least some geographic breakdown of their electricity purchasing, around 100 TWh of electricity purchasing (out of 1,824 TWh) is disclosed without a link to the country/area it is purchased in.

Figure 2: Regional breakdown of electricity purchasing by industry (n=3,195)



RE purchasing claims

2

RE purchasing claims

By company size

It is interesting to note that, on average, total RE purchasing claimed remains similar across different company sizes. It is also worth noting that these claims are not materially different from the current global share of renewables in electricity generation of around 29%. Rather than studying total claims and total purchasing, it is worth to instead look for trends across companies claiming to use at least some RE versus companies that make no claims to be using any RE.

Figure 4 illustrates that companies using more electricity have a greater tendency to claim to be using at least some RE. 81% of super users claim that at least some of their electricity purchasing is renewable, while just over half of small and medium users make RE claims. However, when super users make RE claims, they claim a lower % RE (33%) compared to small and medium users (47%) and large users (40%).

Figure 3: Electricity purchasing and % RE claims by electricity purchasing band (n=9,551)

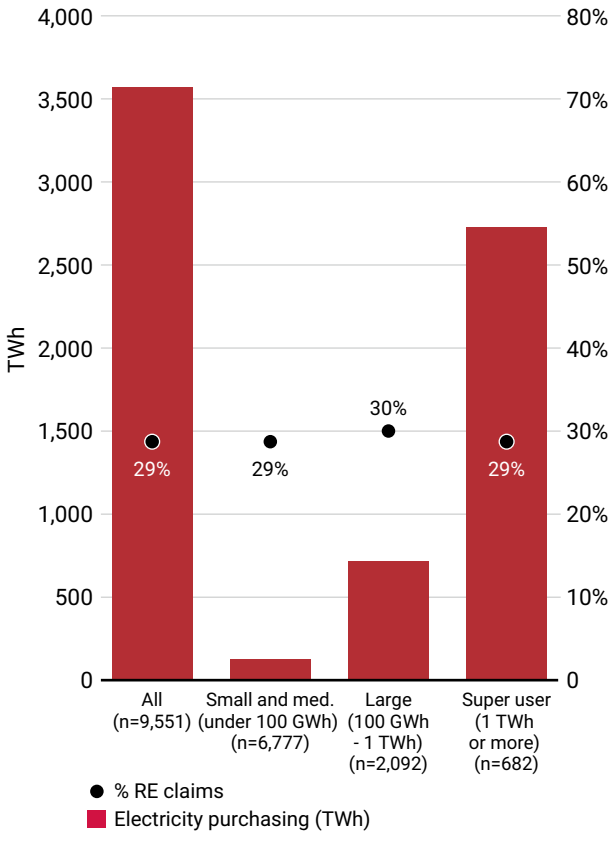
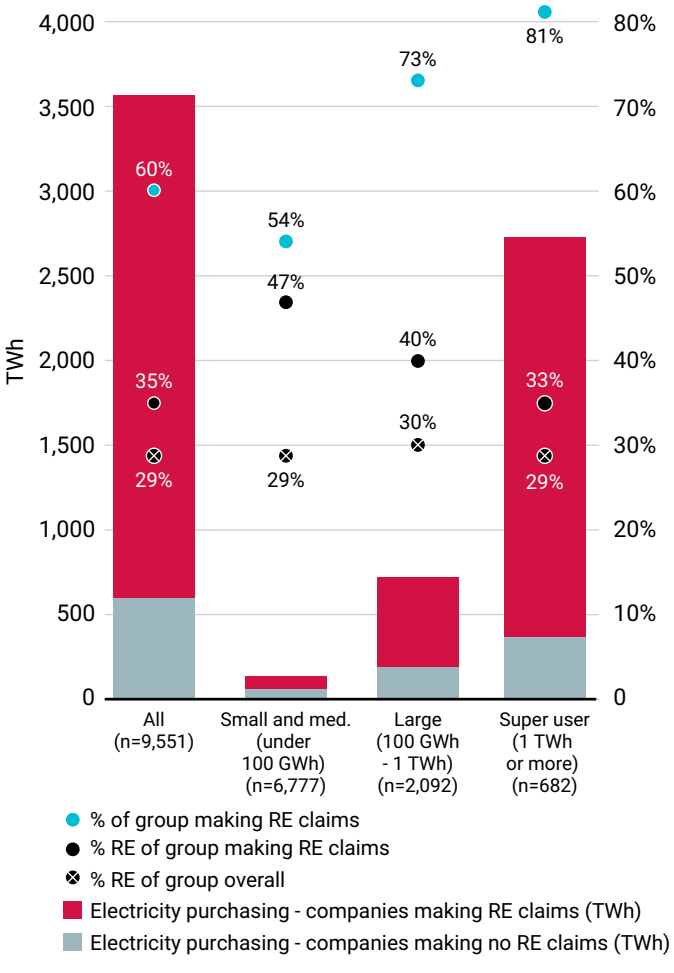


Figure 4: Breakdown by electricity purchasing band of companies making zero and nonzero RE claims (n= 9,551)



By industry/sector

Figure 5: All-industry electricity purchasing and RE claims (n=9,551)

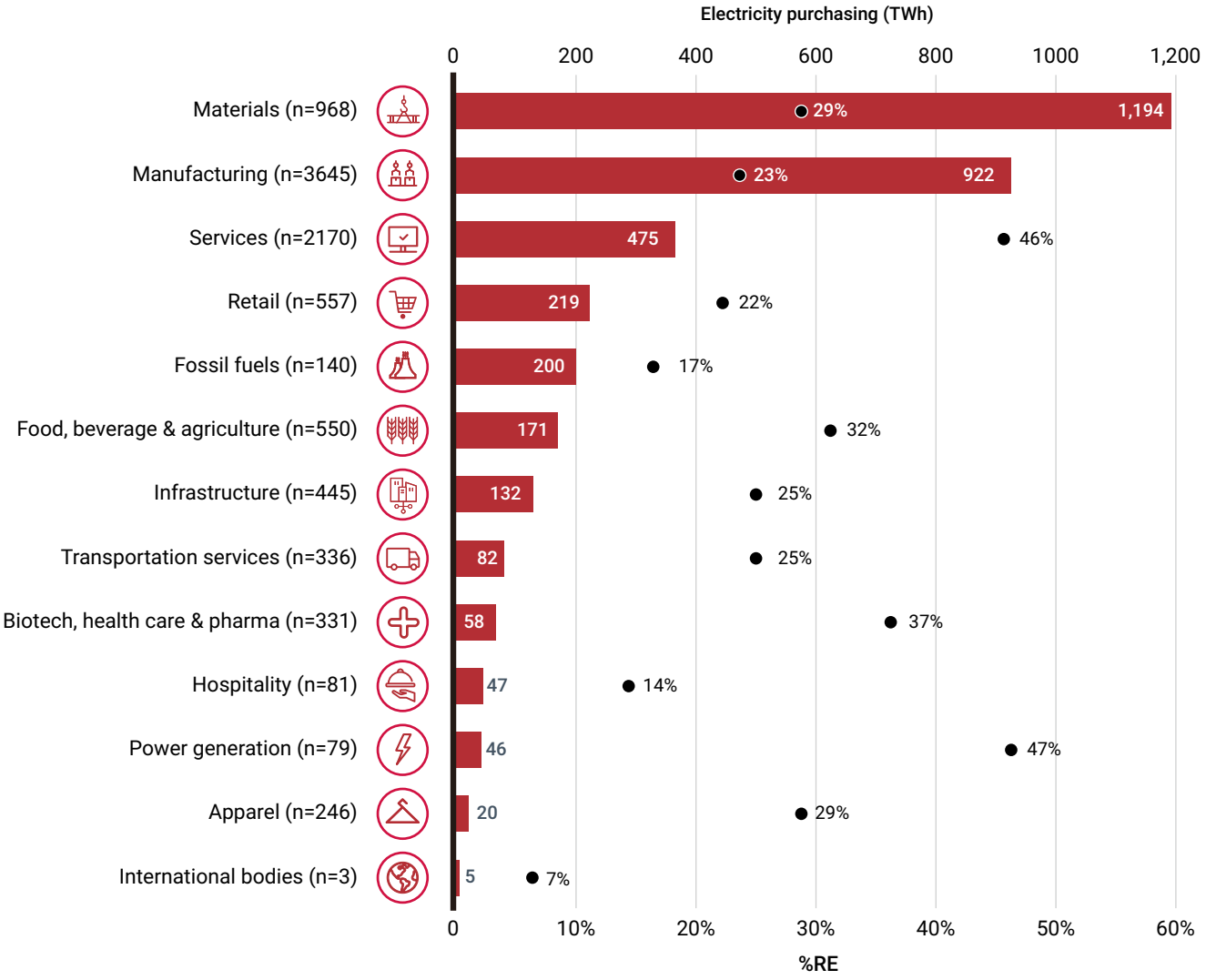


Figure 6: Industry breakdown of 100 largest consumers of purchased electricity

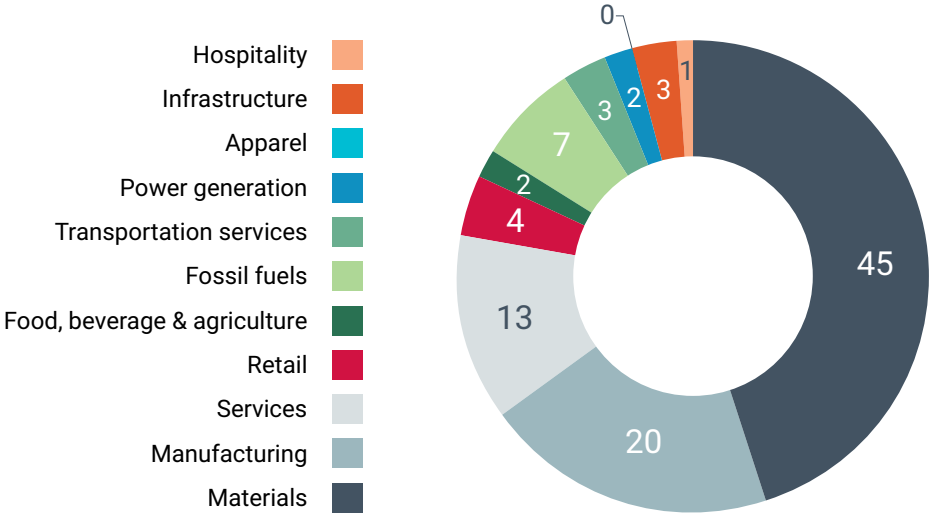


Figure 7: Materials industry electricity purchasing and RE claims (n=968)

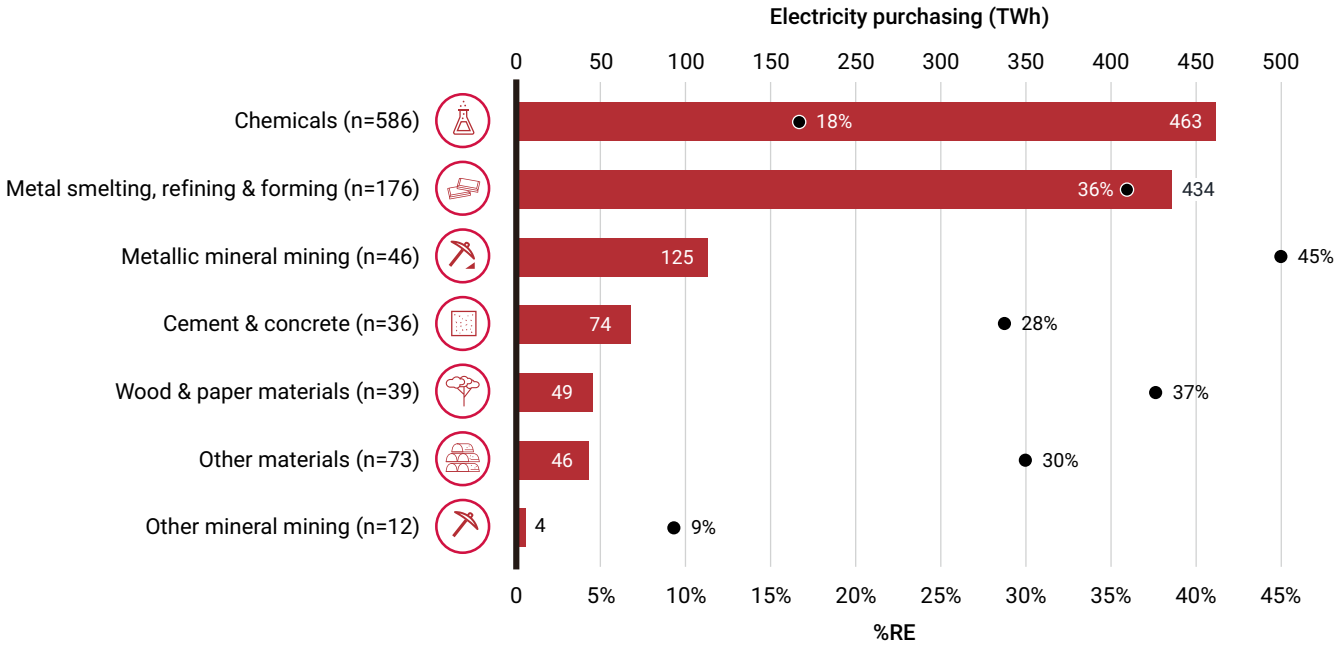
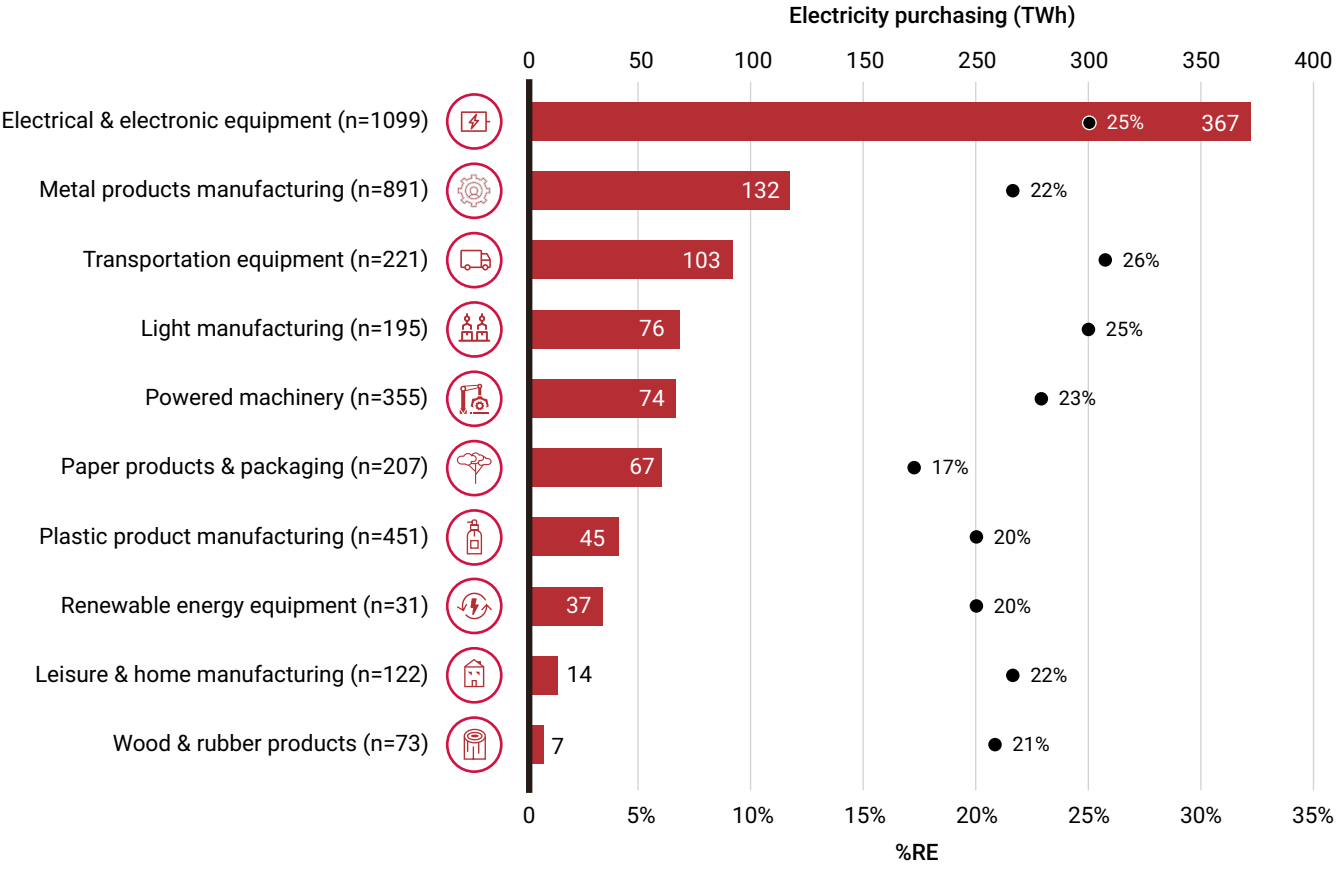


Figure 8: Manufacturing industry electricity purchasing and RE claims (n=3,645)



Electricity use, RE claims, and RE target setting seen in 60 super users

Figures 9-11 detail total electricity purchasing and % RE of the 20 largest electricity users in the materials, manufacturing and all other primary industries. They also highlight where these consumers do and do not disclose targets to increase their RE purchasing.

Figure 9: Electricity purchasing and % RE of the 20 largest electricity users in the materials industry disclosing publicly in 2023

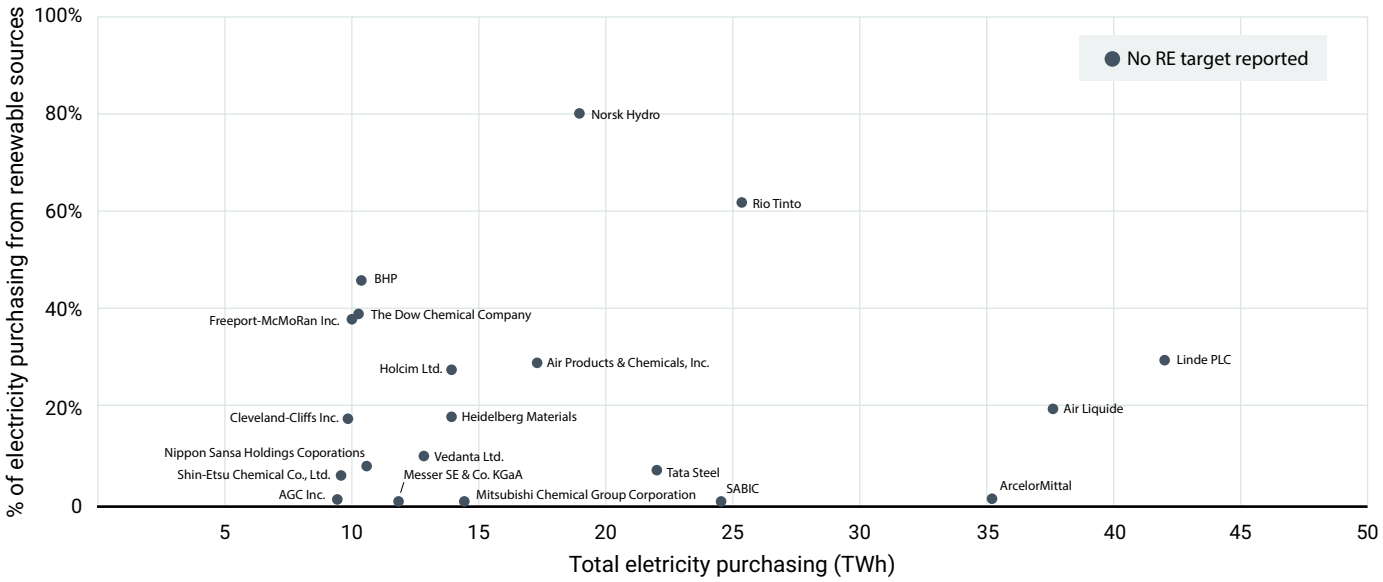
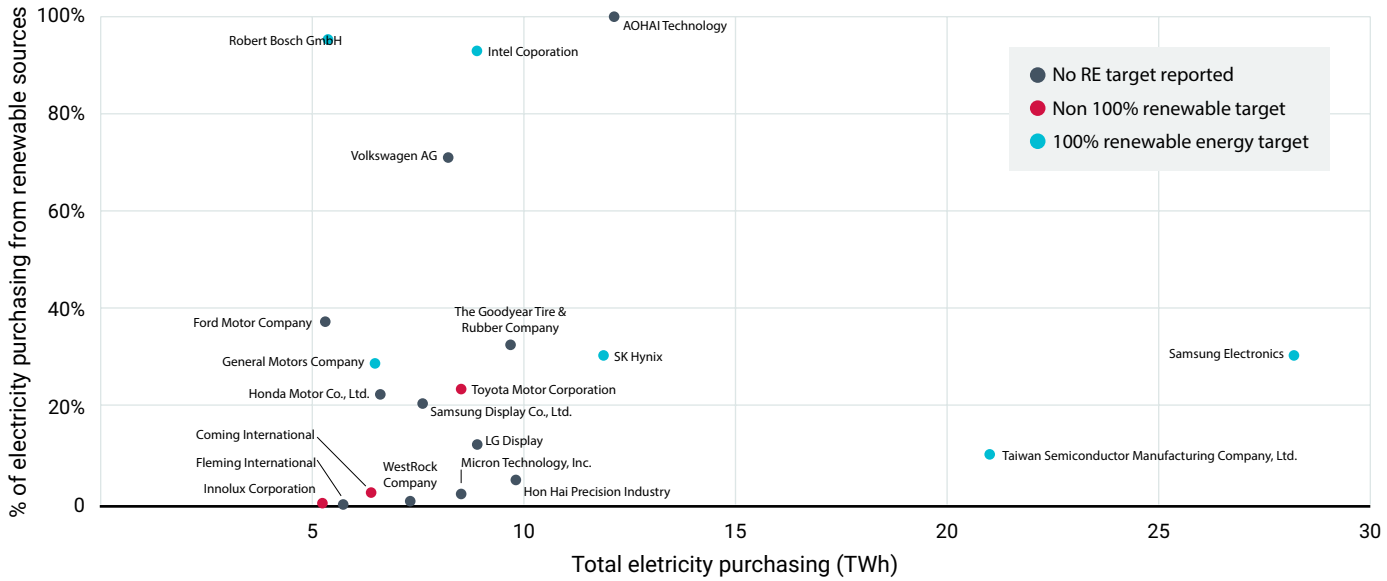


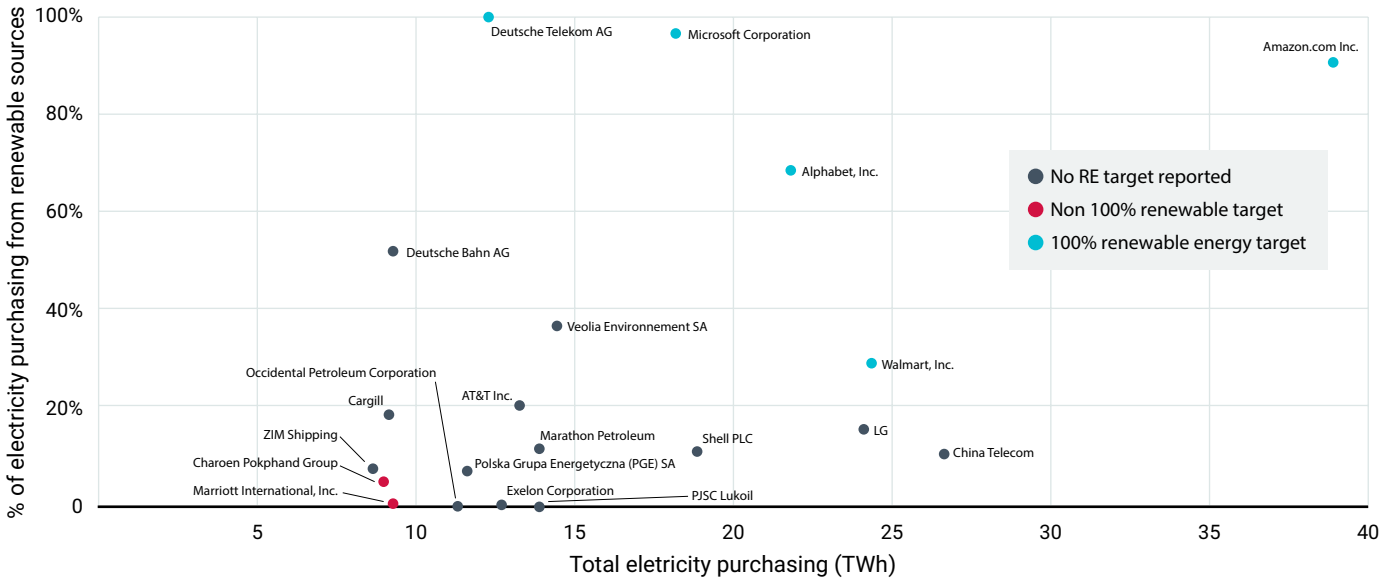
Figure 10: Electricity purchasing and % RE of the 20 largest electricity users in the manufacturing industry disclosing publicly in 2023



None of the 20 materials companies presented in figure 9 reports an RE target.

Figure 11 captures seven companies in the services industry, four in the fossil fuels industry, two in the food, beverage & agriculture, infrastructure, and transportation services industries and one company in the retail, hospitality and power generation industries.

Figure 11: Electricity purchasing and % RE of the 20 largest electricity users in all other industries disclosing publicly in 2023



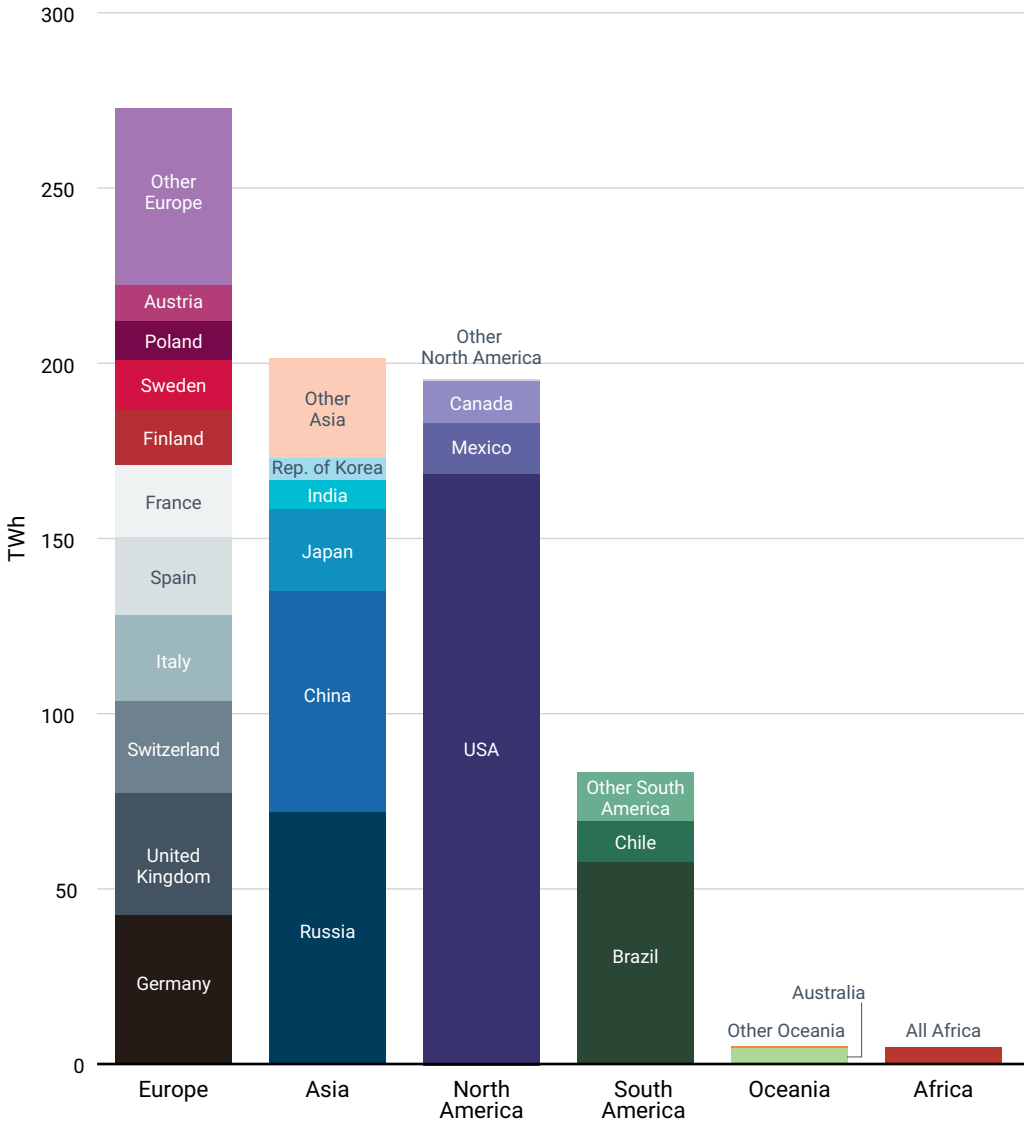
Not all companies' % RE claims in figures 9-11 are comparable because some companies provide differing levels of granularity and transparency in their disclosures. Figure 29 breaks down the detail in all 60 companies' claims.

By region and market

Figures 12-18 begin considering where RE is purchased and how it is purchased, meaning they only capture the 4,595 companies providing this level of detail in their disclosures (see Sample details).

***Note**: while 4,595 companies qualify for this subset, not all claim to use any RE. For example, in figure 13, fewer than 4,595 companies report using either PPAs, contracts with suppliers, or unbundled EAC purchases for their RE purchasing.*

Figure 12: Regional RE purchasing (n=4,595)



While fewer than 900 companies reported purchasing RE through a PPA, these arrangements delivered over

270 TWh

of RE over those companies' reporting periods

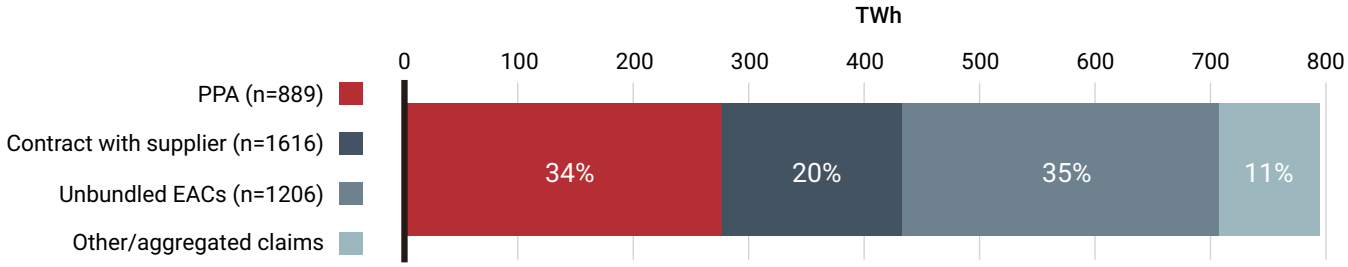
Purchasing mechanisms used

Global

Contracts with electricity suppliers are the modal method for purchasing RE globally and are in use by 1,614 companies reporting in 2023. However, the volume of RE they delivered was smaller than the total volume purchased through unbundled EACs (in use by 1,206 companies) and PPAs. While fewer than 900 companies reported purchasing RE through a PPA, these arrangements delivered over 270 TWh of RE over those companies' reporting periods. PPAs are generally arrangements that only large electricity consumers can access: the median annual electricity purchasing of companies mentioning they have at least one PPA is an order of magnitude greater than the median annual electricity purchasing of companies that mention using at least one contract with supplier or unbundled EAC purchase.

Nearly 100 TWh of RE purchasing was reported with some market-level information, but an unclear purchasing mechanism, usually where companies aggregated their purchasing through multiple mechanisms into one claim.

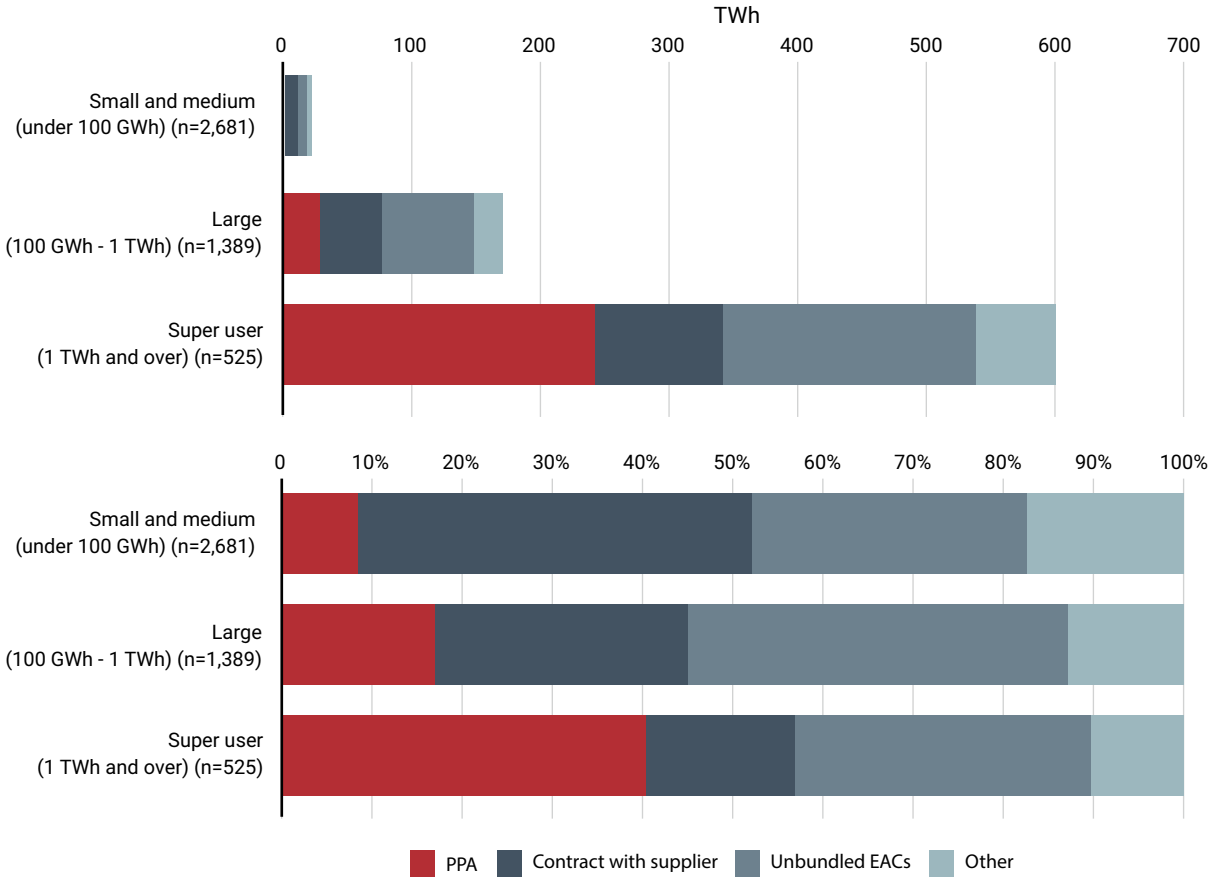
Figure 13: RE purchasing mechanisms used (n=4,595)



By company size

The vast majority of the entire PPA volume is consumed by the 'super users'. Small and medium users rely primarily on their electricity suppliers to source their RE, while large users rely significantly on unbundled EACs.

Figure 14: RE purchasing type distribution for electricity consumers of different sizes (n=4,595)



By industry/sector

The materials industry purchases more RE through power purchase agreements (PPAs) than the next two largest industries (manufacturing and services) combined. While PPAs are often used as a shorthand for long-term contracts between energy users and new renewable energy projects (most often wind or solar projects) which are essential to the financing of those projects, this does not describe all PPAs. In its simplest form, a PPA is defined only by a contract with an electricity generator (in contrast with contracting with an electricity supplier). 'Understanding impact' elaborates on broader 'impact' characteristics seen in the RE purchasing reported by companies. The majority of PPAs used in the materials industry are found in the metal smelting, refining & forming sector. This sector includes some of the largest single corporate electricity users in the world.

Figure 15: RE purchasing mechanisms used, by primary industry (n=4,595)

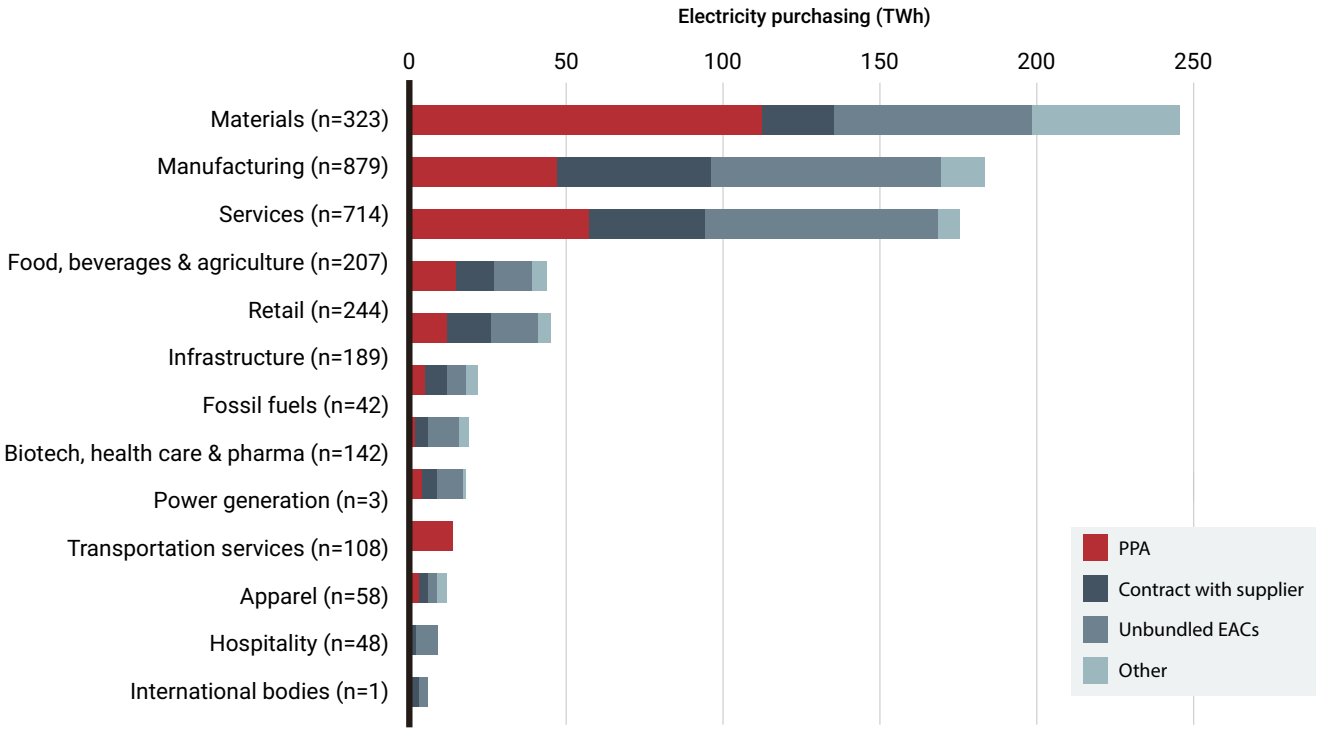
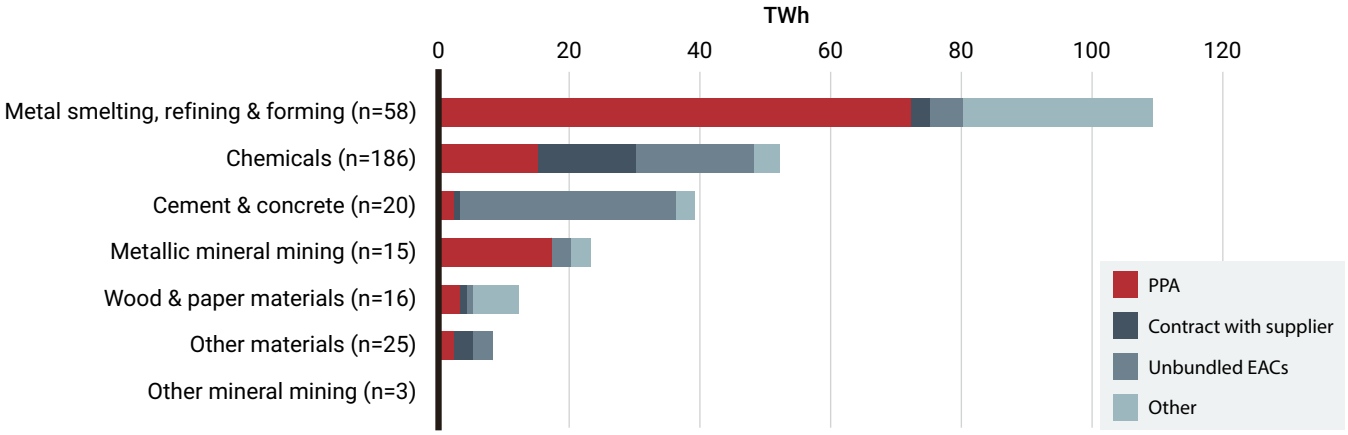
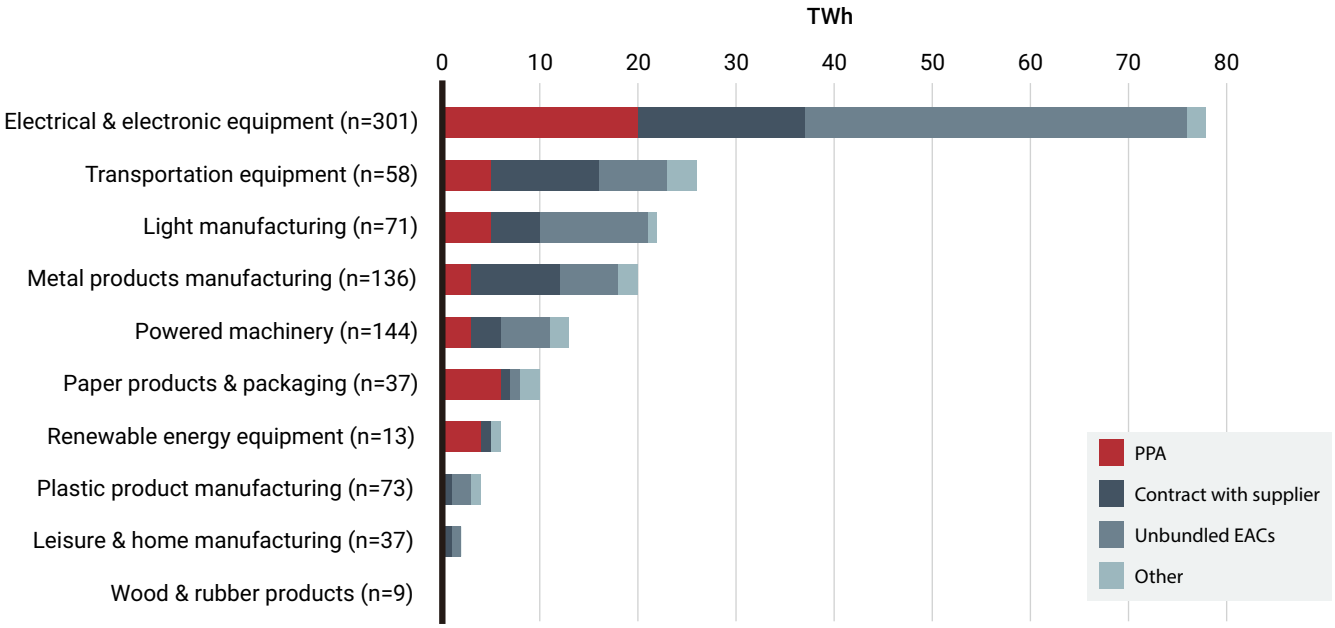


Figure 16: RE purchasing mechanisms used by materials industry companies (n=323)



Electrical & electronic equipment manufacturers dominate the manufacturing industry. Most of their operations are in China, and the sector relies on unbundled EACs for around 50% of the RE it purchases.

Figure 17: RE purchasing mechanisms used manufacturing industry companies (n=879)



By market

Figures 18-22, since presenting % RE at the country/area level, only capture the 3,195 companies providing the most detailed dataset.

Figure 18: Electricity purchasing, % RE, and volumes of RE purchased through PPAs, contracts with suppliers, and unbundled EACs in Europe (n=2,304)

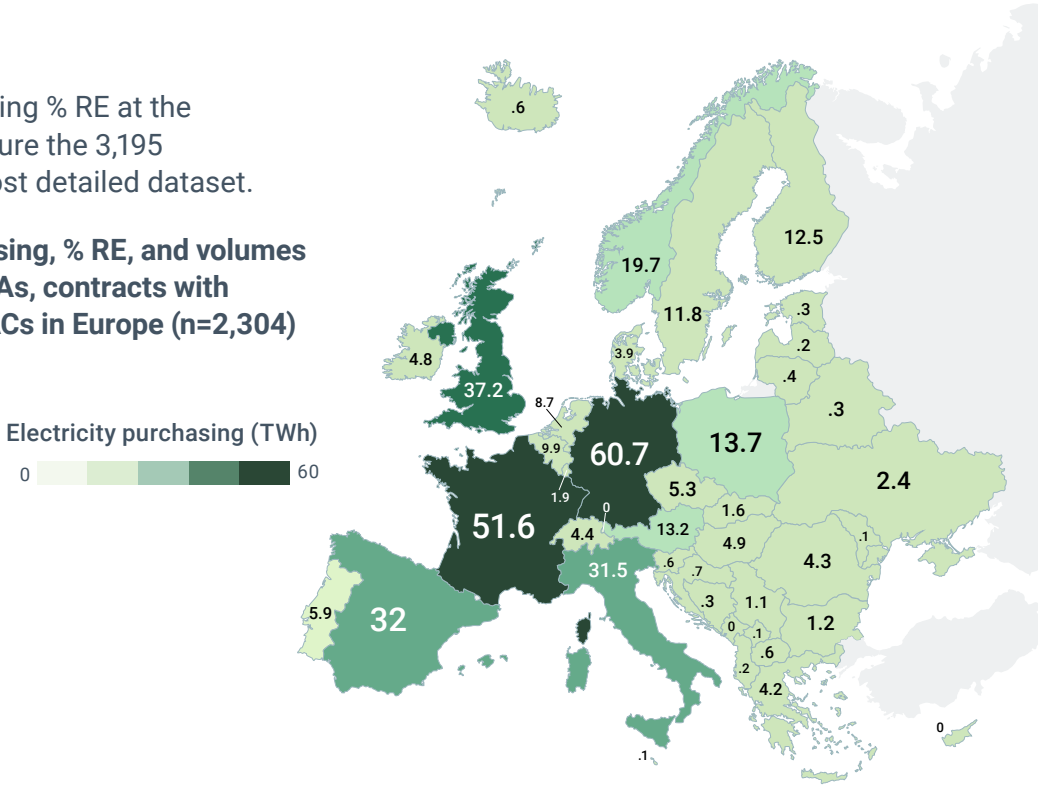
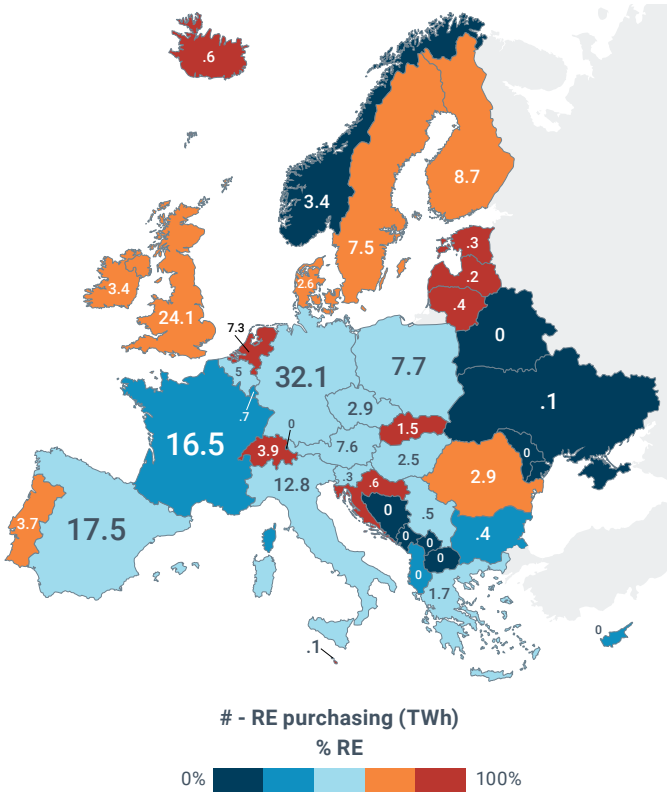
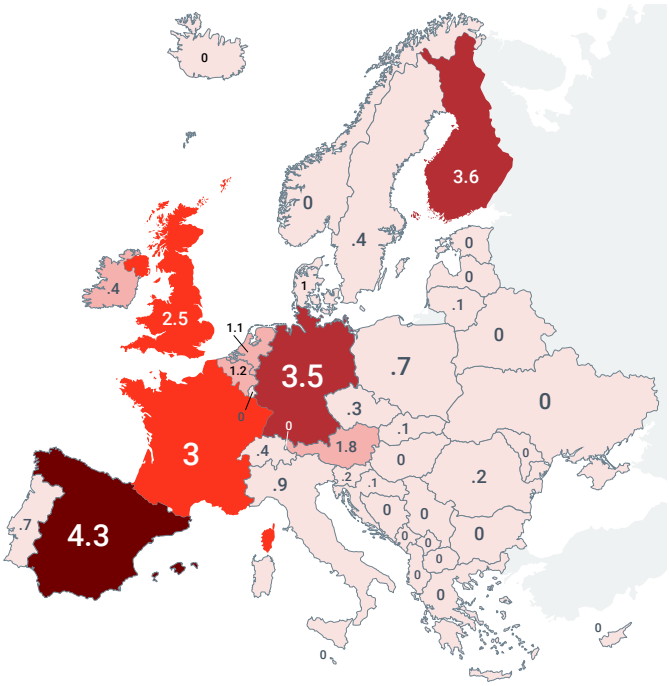


Figure 18: Electricity purchasing, % RE, and volumes of RE purchased through PPAs, contracts with suppliers, and unbundled EACs in Europe (n=2,304) (continued)



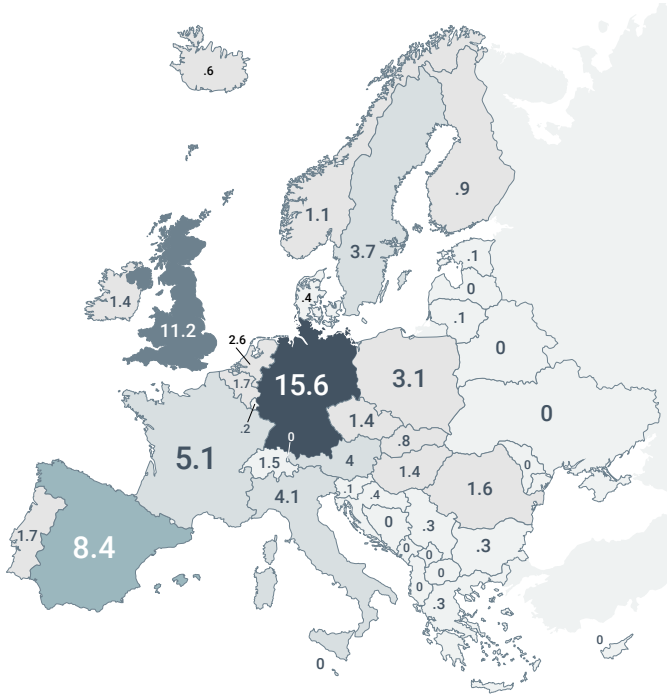
- RE purchasing (TWh)
% RE

0% 100%



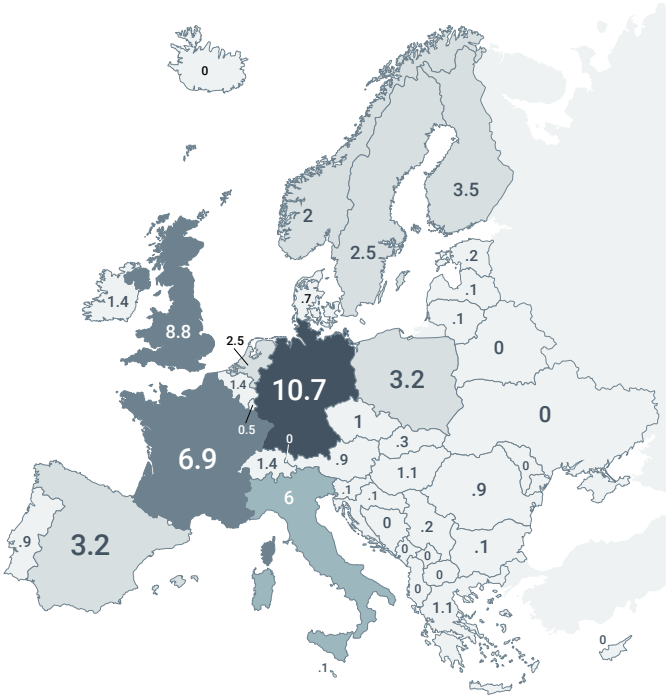
PPA (TWh)

0 5



Contract with supplier (TWh)

0 16



Unbundled EACs (TWh)

0 10

Figure 19: Electricity purchasing, % RE, and volumes of RE purchased through PPAs, contracts with suppliers, and unbundled EACs in North America (n=2,753)

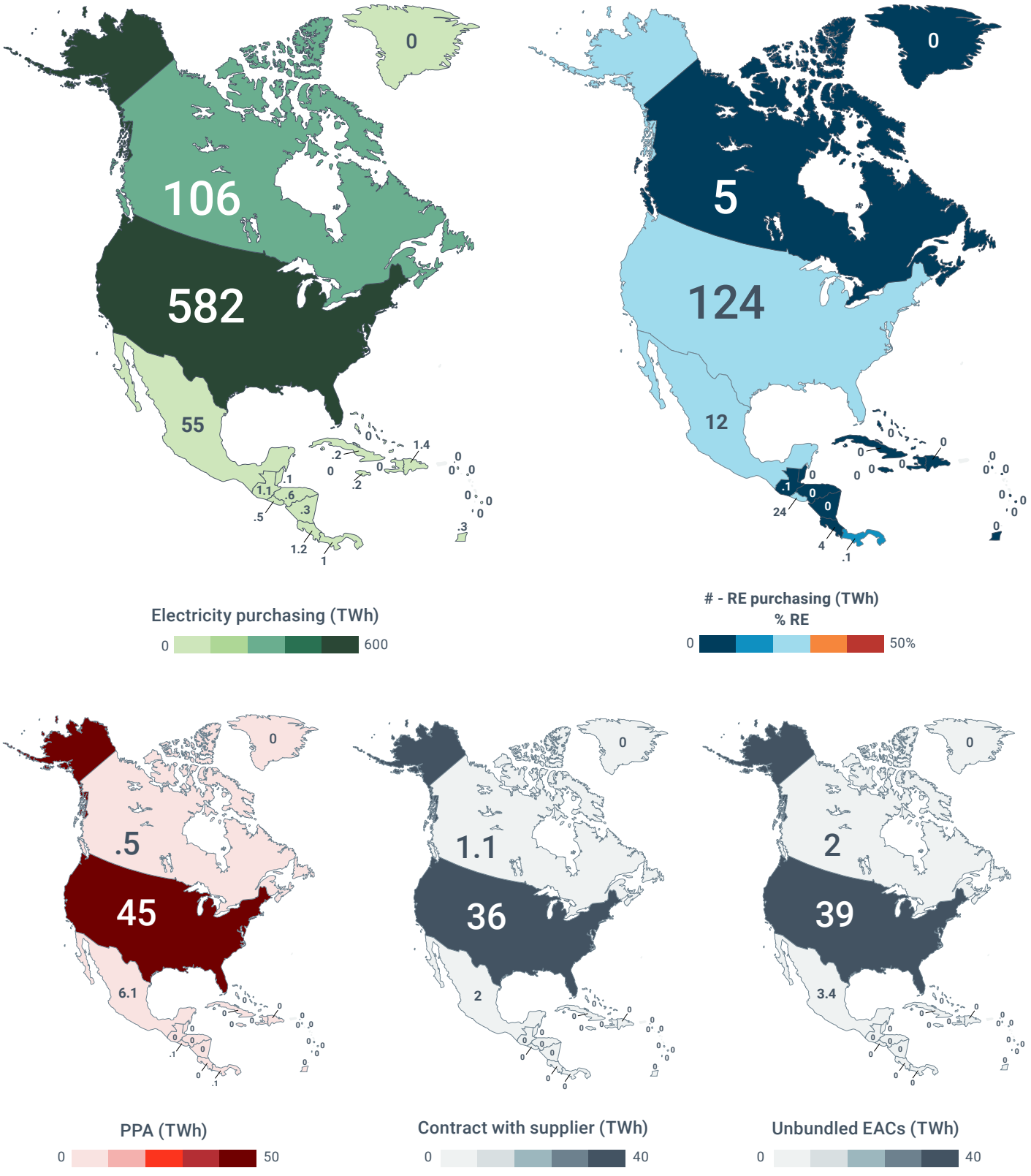


Figure 20: Electricity purchasing and volumes of RE purchased in Africa (n=554)

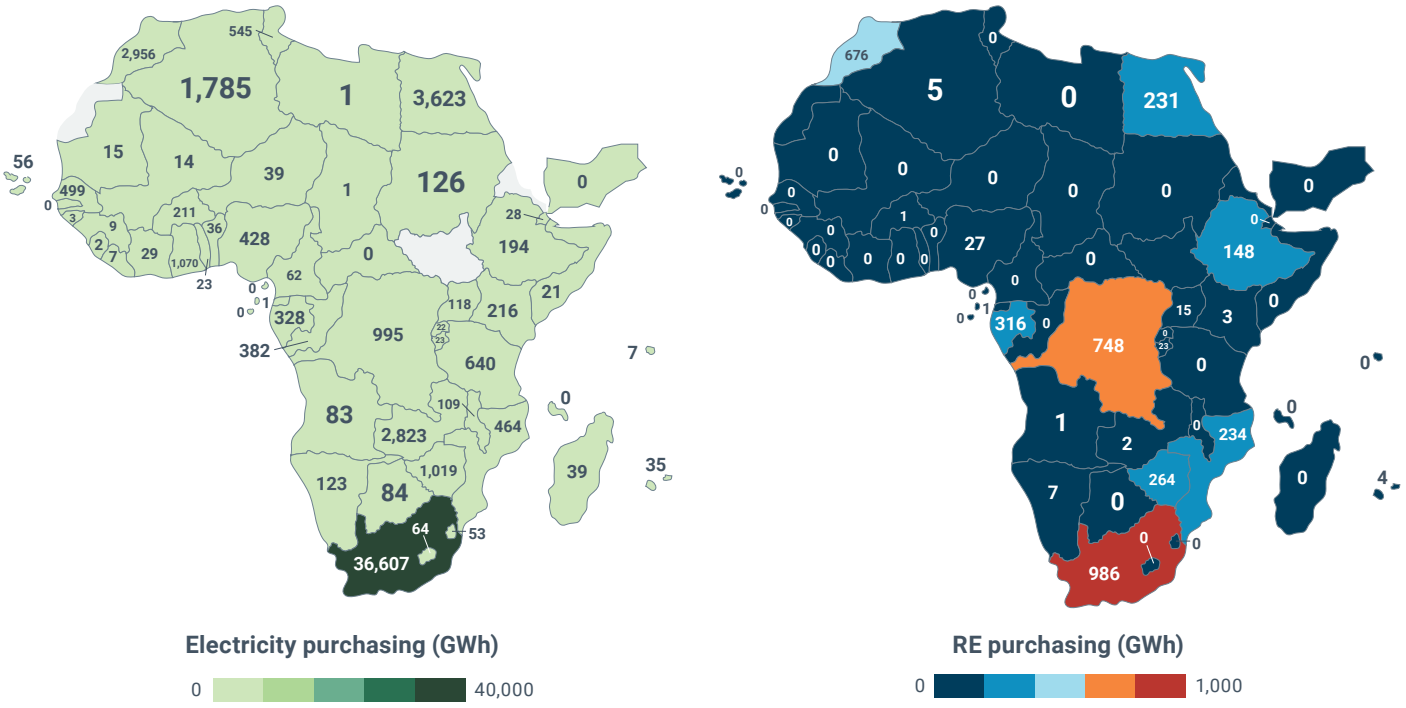
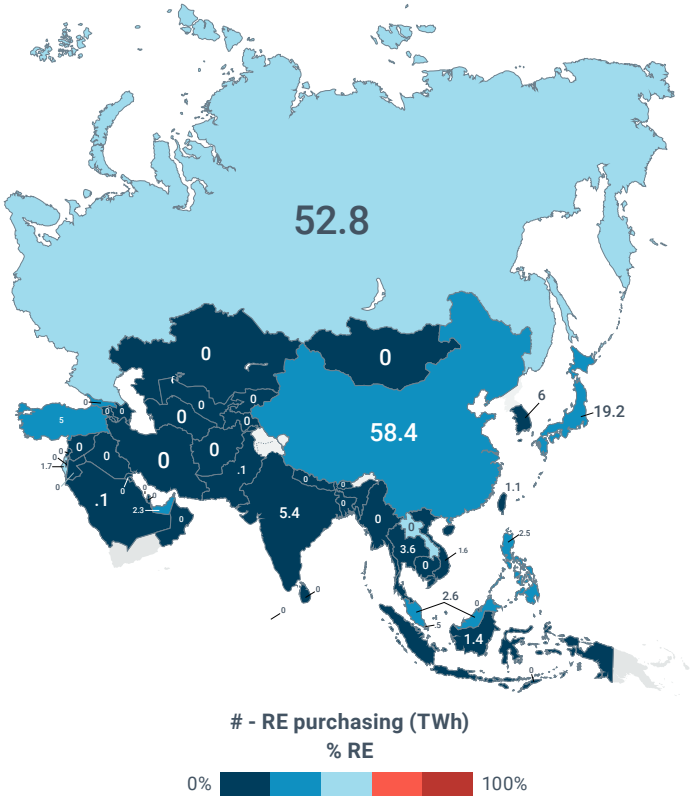


Figure 21: Electricity purchasing, % RE, and volumes of RE purchased through PPAs, contracts with suppliers, and unbundled EACs in Asia (n=2,079)

Figure 21: Electricity purchasing, % RE, and volumes of RE purchased through PPAs, contracts with suppliers, and unbundled EACs in Asia (n=2,079) (continued)



- RE purchasing (TWh)
% RE

0% 100%

PPA (TWh)

0 50

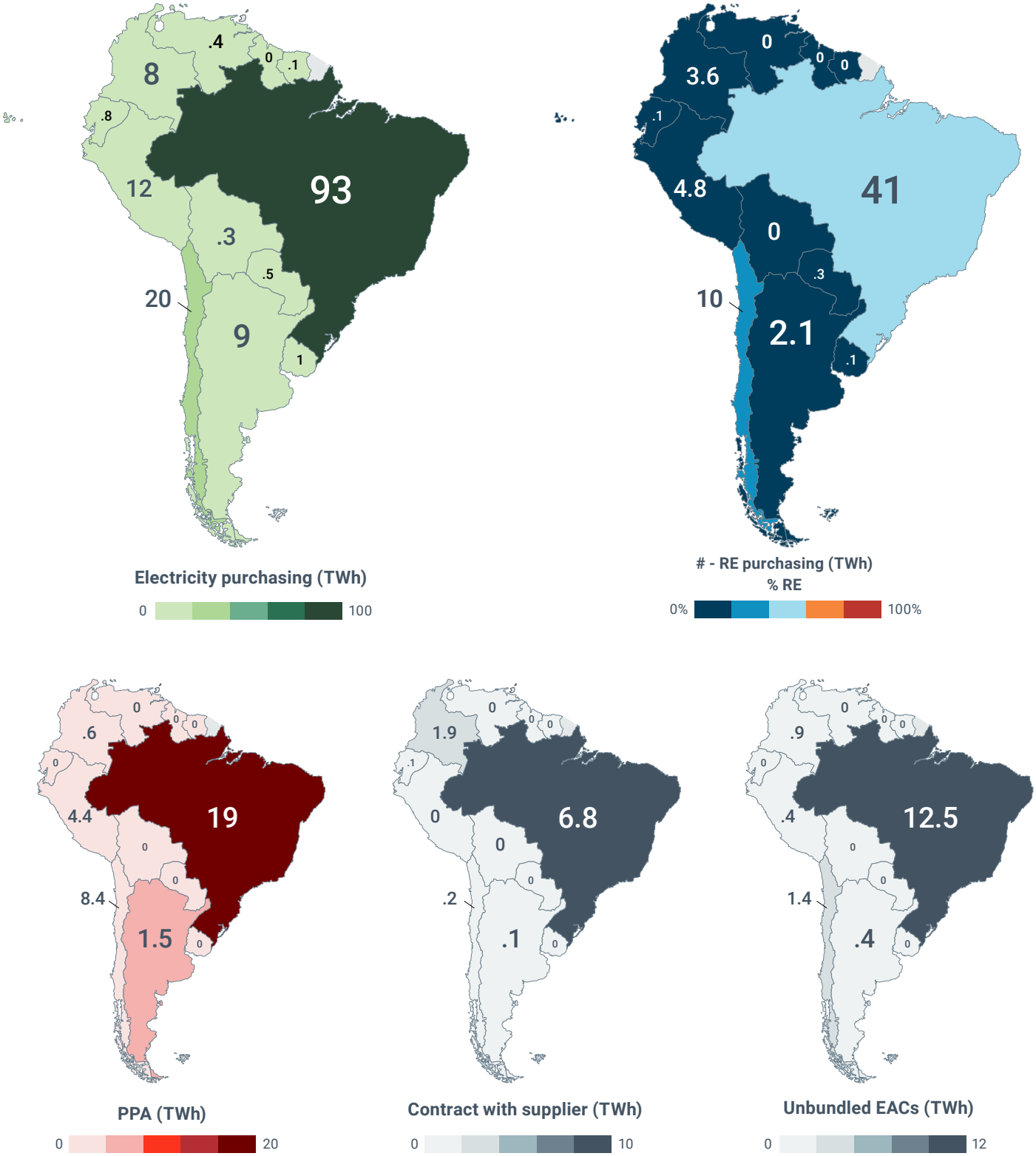
Contract with supplier (TWh)

0 10

Unbundled EACs (TWh)

0 20

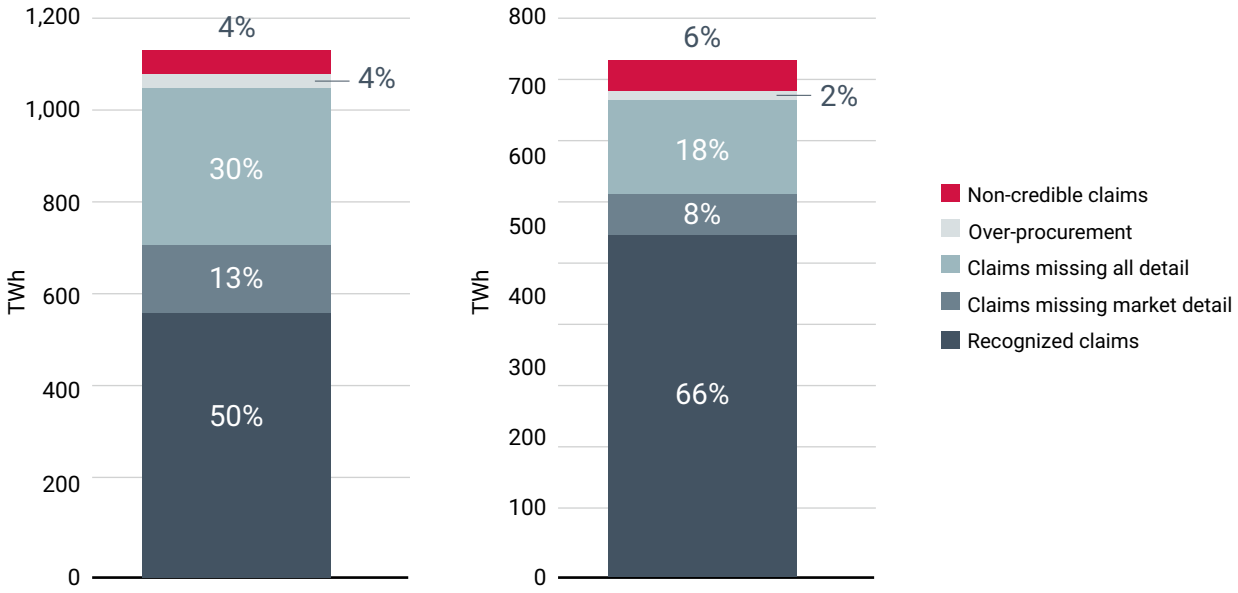
Figure 22: Electricity purchasing, % RE, and volumes of RE purchased through PPAs, contracts with suppliers, and unbundled EACs in South America (n=818)



Impact and credibility of claims

Overall claim recognition[1]

Figure 23: Overall claim recognition for entire sample (9,551 companies) (left) and companies submitting the most detailed dataset (3,195 companies) (right)



Across 9,551 companies, nearly 500 TWh of RE purchasing is claimed without describing where or how it is purchased (meaning its credibility cannot be understood). Around 50 TWh of RE purchasing is claimed but includes information suggesting the claim is not credible. This can mean that claim does not consider market boundaries (for example, purchasing an EAC from a generator located in China, but making a claim to RE use in the Republic of Korea), or is based on double counting (for example, claiming from the grid average of RE without having actively purchased RE). Around 31 TWh of RE was over-procured: when a company claims more use of purchased RE in a market than the total electricity purchasing it reports in the market.

Across the 3,195 companies submitting the most detailed dataset (where companies included at least some information about where they used electricity and the mechanisms they used to purchase RE), there remain significant volumes of claims that do not include sufficient detail to understand their credibility.

1 Figure notes

- The total RE claimed in figure 23 (left) exceeds the 1,031 TWh RE mentioned in the introduction of this report. The reason is that the figure of 1,031 TWh is based on companies' responses to C8.2a, which captures a single, global total for purchased energy and renewable energy purchasing. Figure 23 is based on C8.2a and C8.2e/h together. C8.2e/h captures market and purchasing type data for purchased RE. Companies' disclosures across C8.2a and C8.2e/h should be consistent, but sometimes are not.
- 'Recognized claims' refers to a claim made in C8.2e or C8.2h (where companies disclose where and how they purchase RE) using a purchasing type standardized by CDP (based on RE100 definitions) and which observes market boundaries recognized by CDP (based on RE100 definitions) and which is matched with disclosure in C8.2g (where companies disclose their electricity consumption broken down by country/area) of underlying electricity consumption in the market where the claim is made.
- 'Claims missing market detail' refers to a claim made in C8.2e and C8.2h that would be recognized, except for the fact that there is no disclosure in C8.2g of underlying electricity consumption in the market where the claim is made.
- 'Claims missing all detail' refers to claims made in C8.2a (where companies disclose a single global total for electricity purchasing and RE purchasing) that exceed the total reported in C8.2e or C8.2h (totals across C8.2a and C8.2e or C8.2h should be consistent).
- 'Over-procurement' refers to claims in C8.2e or C8.2h that exceed total underlying electricity purchasing in C8.2g.
- 'Non-credible claims' refers to claims made in C8.2e or C8.2h where the purchasing type suggests the claim involves double counting (for example, a claim from the grid mix), or does not observe market boundaries.

~43 companies

include explicit information in their RE claims indicating they claim from the grid mix

Claims from the grid mix

In most markets, there exists some form of consumer choice in electricity procurement. This means a company can choose to be supplied with RE or not. This therefore means that, except where certain regulatory mechanisms exist that supply some amount of RE to users as a public good (for example, Renewable Portfolio Standard legislation present in several countries), or where markets have highly renewable generation mixes and no mechanisms for allocating property rights to RE (which currently only describes Paraguay, Uruguay, and Ethiopia), companies can only claim to be using RE when they have actively purchased it. A market with 50% RE in its generation mix does not mean that any company can claim to be using 50% RE without taking any action, since this would mean double-claiming the RE other companies have actively chosen to purchase.

At least 43 companies include explicit information in their RE claims indicating they claim from the grid mix. In other cases, where companies include no taxonomic information for their RE purchasing (they only self-report), many claims may be from the grid mix.

Regional credibility of claims

Figures 24-27 detail where the roughly 50 TWh of RE claims are made but include information suggesting the claim is not credible. Since they do not comment on % RE, they use the set of 4,595 companies providing detail about where and how they purchase RE, but not necessarily also detail about how much total underlying electricity they consume in each country/area.

Nearly half of the RE claims in Canada cite the grid mix as their basis. Since mechanisms in Canada exist to purchase RE, only those companies using those mechanisms can claim to be using RE there.

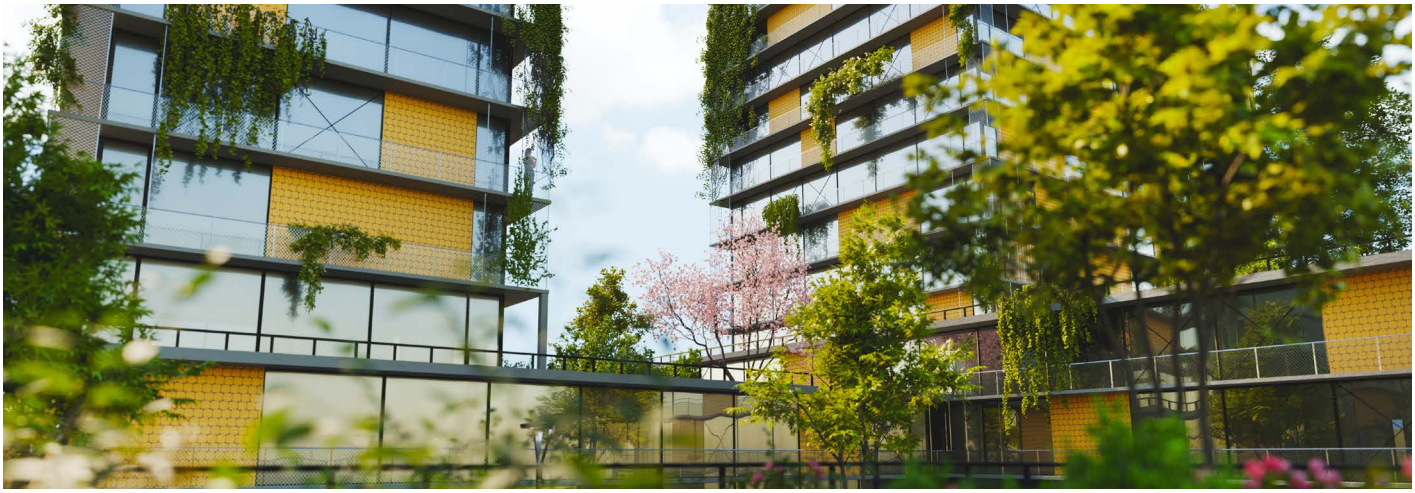


Figure 24: RE claims (left) and RE claims including information suggesting the claim is not credible (right), North America[2]

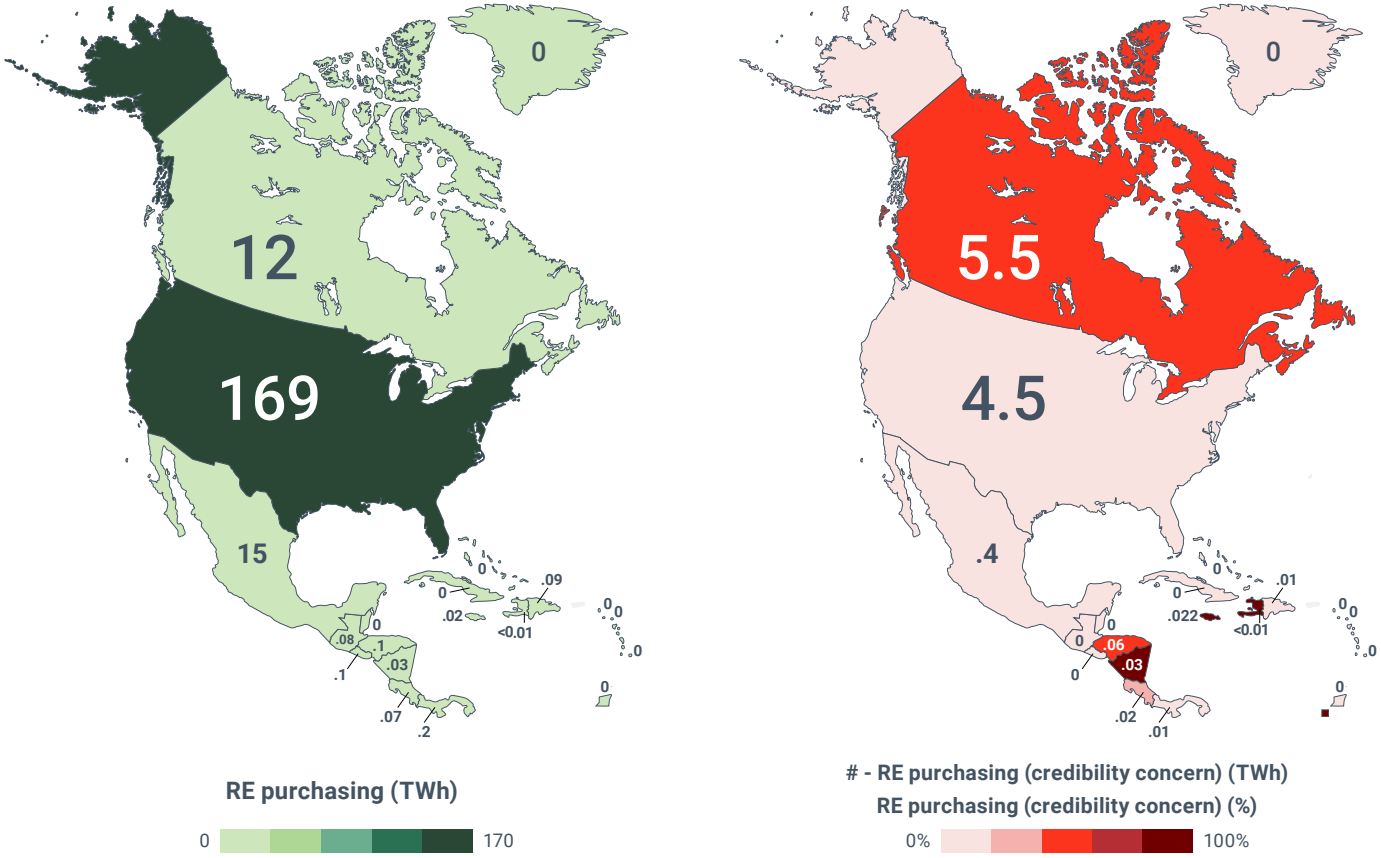
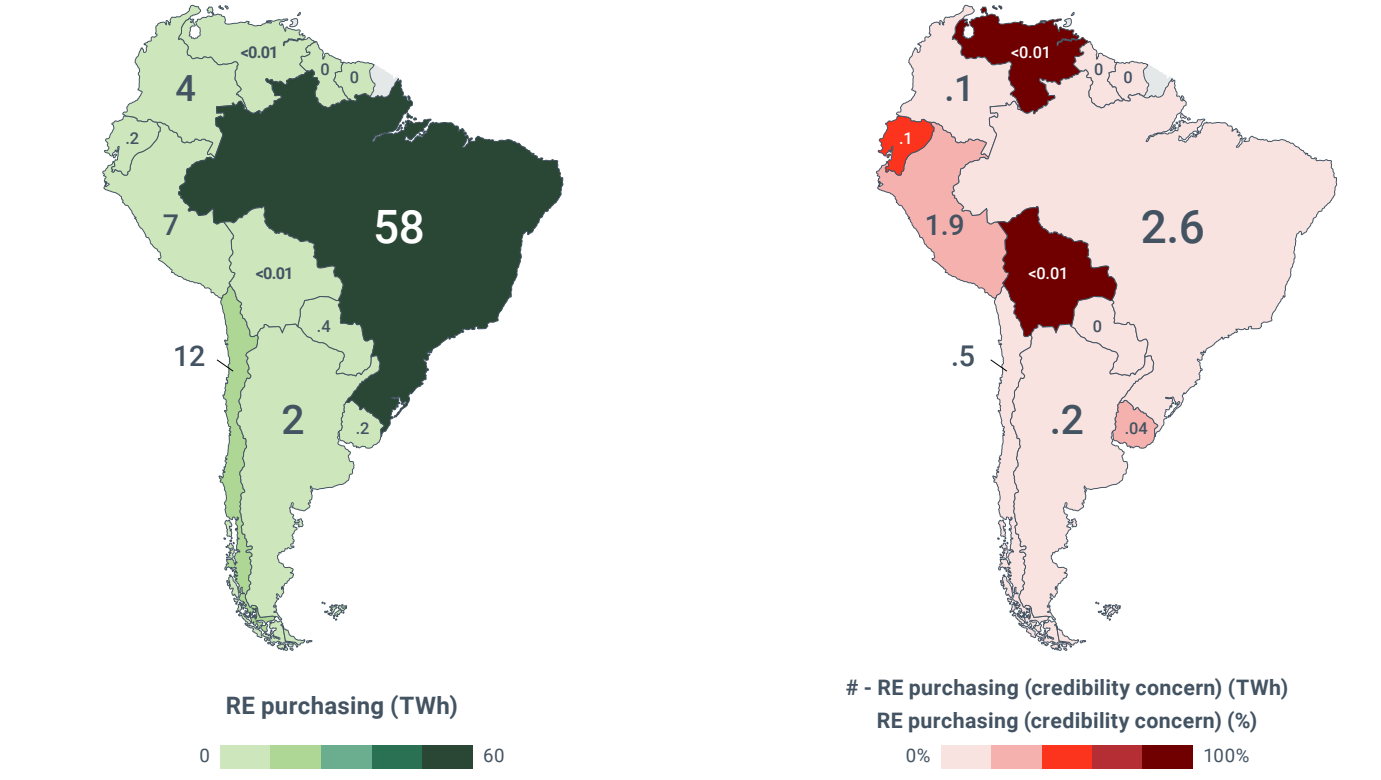


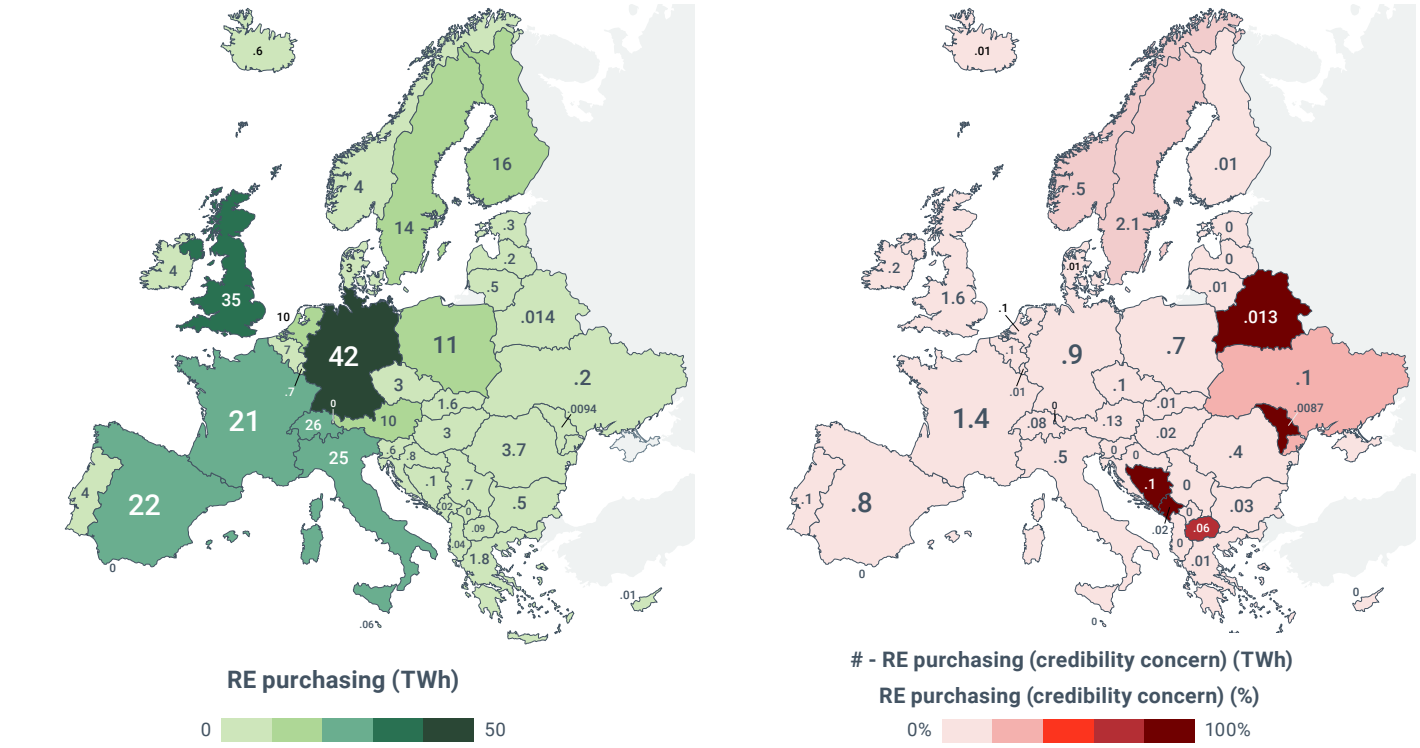
Figure 25: RE claims (left) and RE claims including information suggesting the claim is not credible (right), South America[3]



2 RE purchasing volumes which are less than 0.01 TWh but greater than zero are displayed as <0.01.
3 RE purchasing volumes which are less than 0.01 TWh but greater than zero are displayed as <0.01.

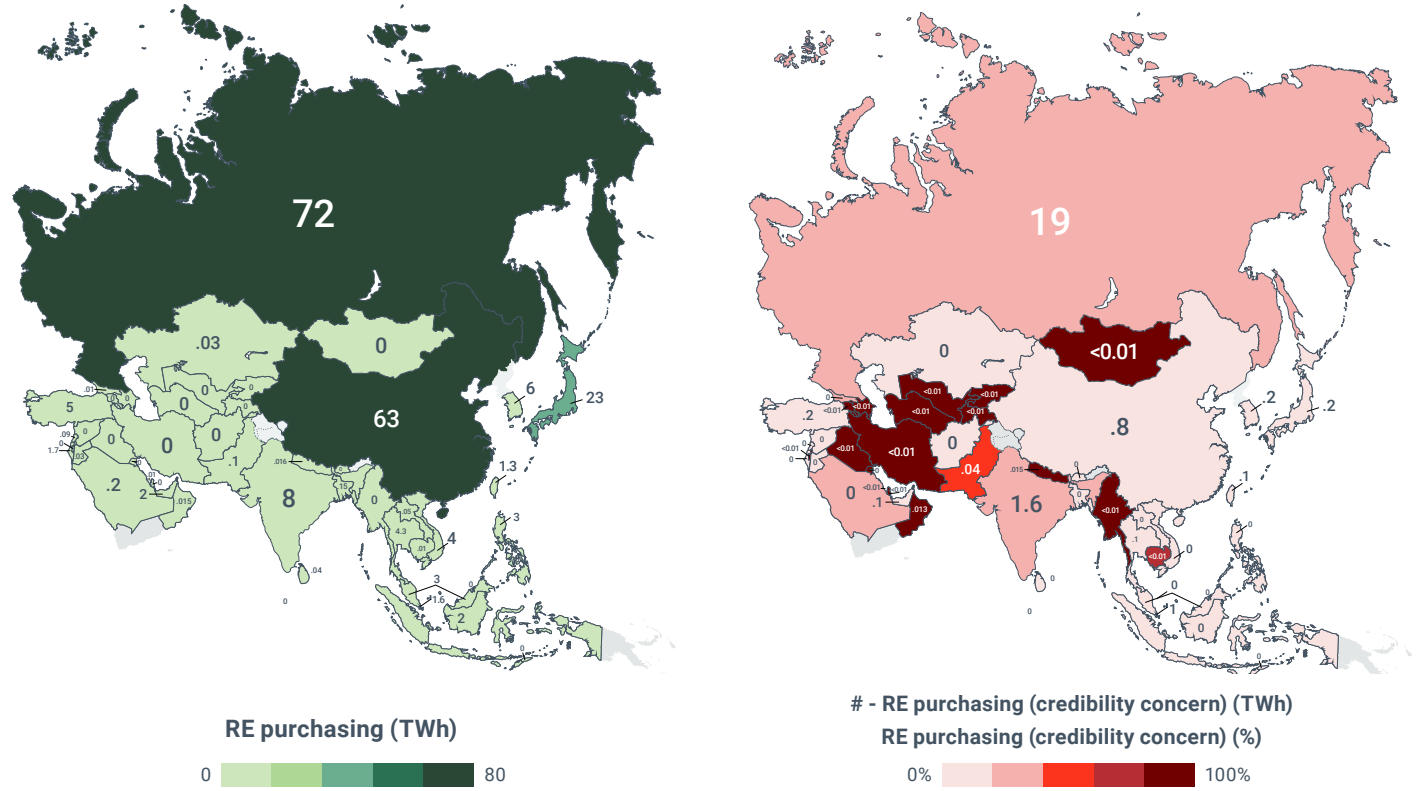
Most RE claims in Europe with credibility concerns do not observe market boundaries (for example, claims in Belarus and Ukraine). However, some claims from the grid mix in Norway and Sweden are also significant.

Figure 26: RE claims (left) and RE claims including information suggesting the claim is not credible (right), Europe



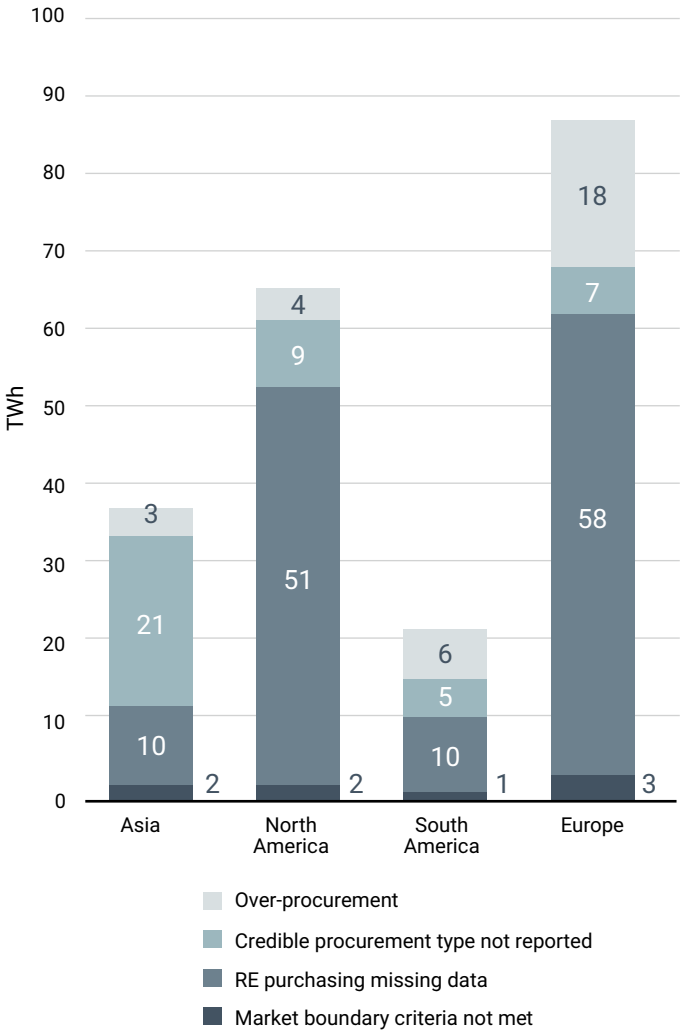
In Asia, most RE purchasing claims with a credibility concern do not observe market boundaries. However, in Russia, an exceptionally high volume of RE is claimed from the grid mix by a small number of very large electricity users.

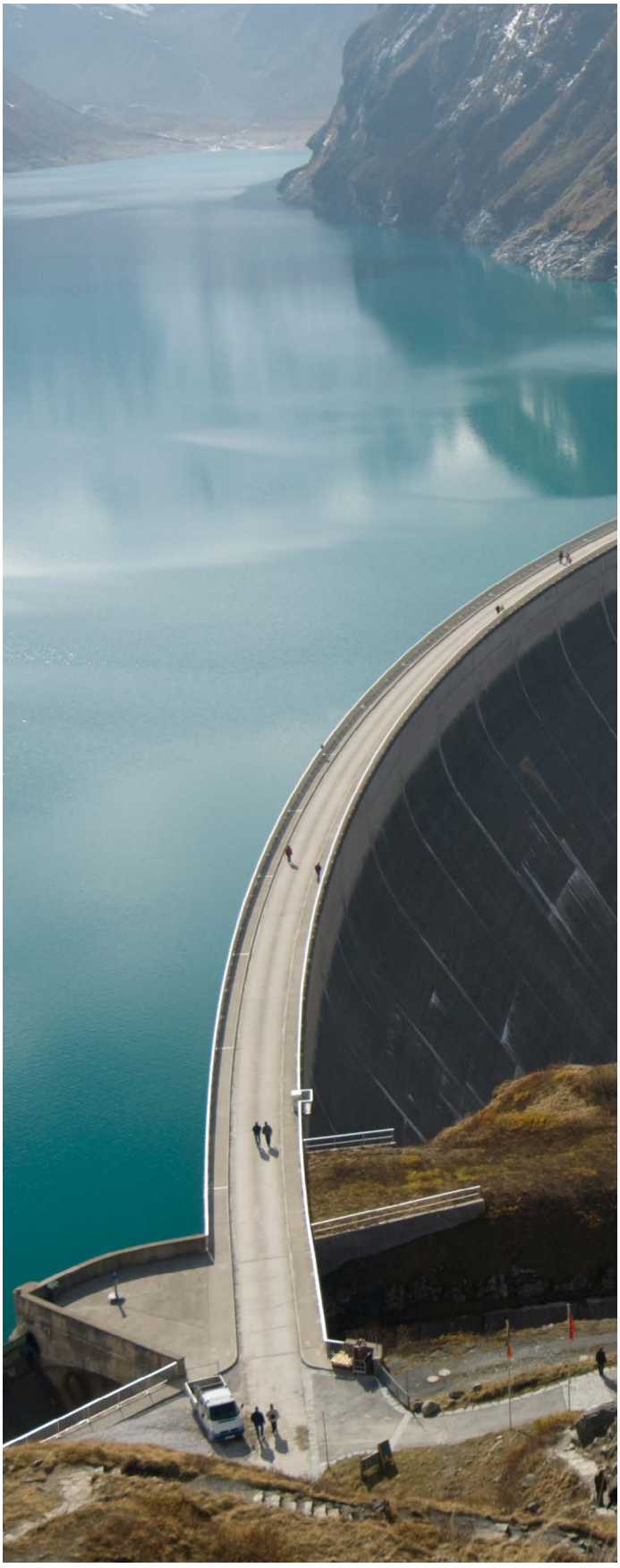
Figure 27: RE claims (left) and RE claims including information suggesting the claim is not credible (right), Asia[4]



4 RE purchasing volumes which are less than 0.01 TWh but greater than zero are displayed as <0.01.

Figure 28: Regional breakdown of RE claims with credibility concerns (n=3,195)





Credibility of claims of largest electricity users[2]

Figure 29: Colors and labels are equivalent to labelling in figure 23 (see footnote 1)

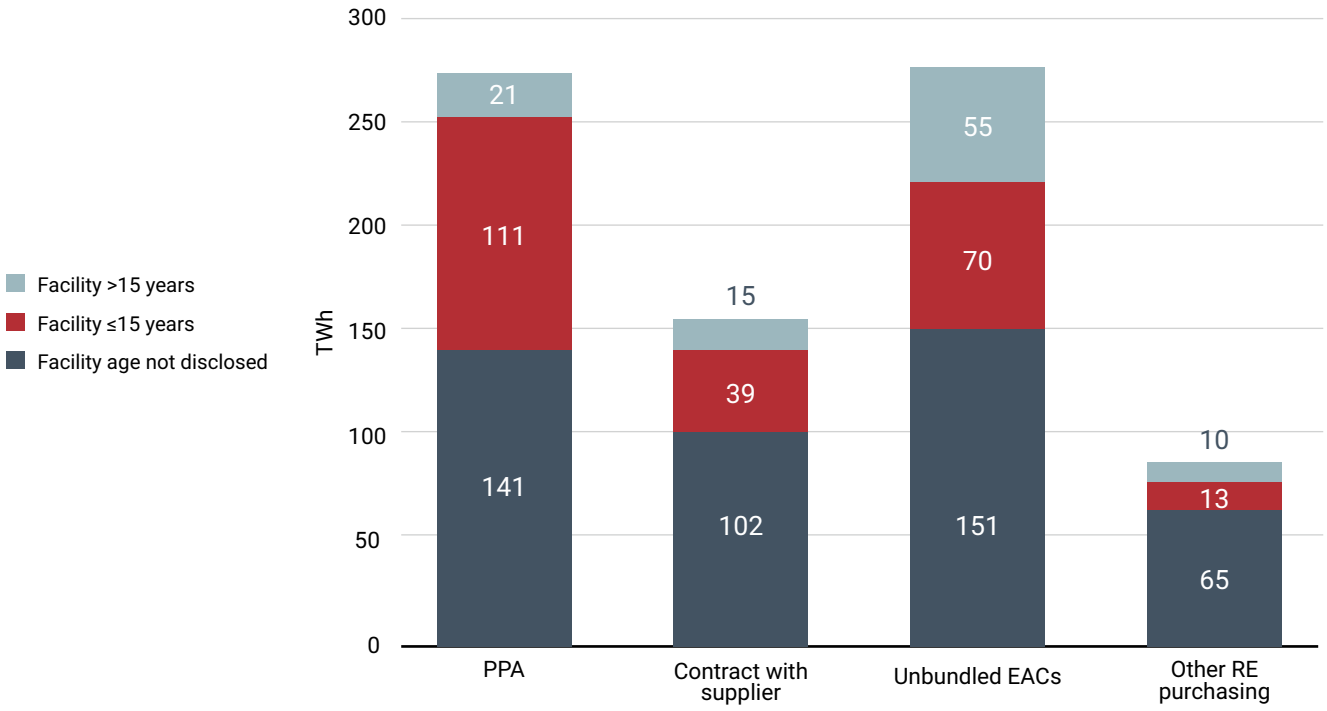
Organization	Primary industry	Electricity purchasing (C8.2a) (TWh)	% RE (reported) (C8.2a)	Quality of % RE claim (based on C8.2g and C8.2e/h) Green - recognized claims Blue - claims missing market detail Grey - claims missing all detail Orange - over-procurement Red - non-credible
Linde PLC	Materials	42	30%	
Air Liquide	Materials	38	20%	
ArcelorMittal	Materials	35	2%	
Rio Tinto	Materials	25	62%	
SABIC	Materials	24	1%	
Tata Steel	Materials	22	7%	
Norsk Hydro ASA	Materials	19	81%	
Air Products & Chemicals, Inc.	Materials	17	29%	
Mitsubishi Chemical Group Corporation	Materials	14	1%	
Holcim Ltd.	Materials	14	28%	
Heidelberg Materials	Materials	14	19%	
Vedanta Ltd	Materials	13	11%	
Messer SE & Co. KGaA	Materials	12	1%	
Nippon Sanso Holdings Corporation	Materials	10	8%	
BHP	Materials	10	46%	
The Dow Chemical Company	Materials	10	39%	
Freeport-McMoRan Inc.	Materials	10	39%	
Cleveland-Cliffs Inc.	Materials	10	18%	
Shin-Etsu Chemical Co., Ltd.	Materials	9.5	7%	
AGC Inc.	Materials	9.4	2%	
Samsung Electronics	Manufacturing	28	31%	
Taiwan Semiconductor Manufacturing Company, Ltd.	Manufacturing	21	10%	
AOHAI TECHNOLOGY	Manufacturing	12	100%	
SK Hynix	Manufacturing	12	30%	
Hon Hai Precision Industry	Manufacturing	10	5%	
The Goodyear Tire & Rubber Company	Manufacturing	10	32%	
LG Display	Manufacturing	8.9	12%	
Intel Corporation	Manufacturing	8.9	92%	
Micron Technology, Inc.	Manufacturing	8.5	2%	
Toyota Motor Corp.	Manufacturing	8.5	24%	

2 Colors and labels are equivalent to labelling in figure 23 (see footnote 1)

Organization	Primary industry	Electricity purchasing (C8.2a) (TWh)	% RE (reported) (C8.2a)	Quality of % RE claim (based on C8.2g and C8.2e/h) Green - recognized claims Blue - claims missing market detail Grey - claims missing all detail Orange - over-procurement Red - non-credible
Volkswagen AG	Manufacturing	8.2	71%	
Samsung Display Co.,Ltd	Manufacturing	7.6	21%	
WestRock Company	Manufacturing	7.4	1%	
Honda Motor Co., Ltd.	Manufacturing	6.6	23%	
General Motors Company	Manufacturing	6.5	29%	
Corning Incorporated	Manufacturing	6.4	3%	
Fleming International	Manufacturing	5.7	0%	No claims
Ford Motor Company	Manufacturing	5.3	37%	
Robert Bosch GmbH	Manufacturing	5.3	95%	
Innolux Corporation	Manufacturing	5.2	0%	
Amazon.com Inc	Services	39	91%	
China Telecom	Services	27	11%	
Walmart, Inc.	Retail	24	29%	
LG	Services	24	16%	
Alphabet, Inc.	Services	22	69%	
Shell PLC	Fossil fuels	19	12%	
Microsoft Corporation	Services	18	97%	
Veolia Environnement SA	Infrastructure	14	37%	
PJSC Lukoil	Fossil fuels	14	0%	No claims
Marathon Petroleum	Fossil fuels	14	12%	
AT&T Inc.	Services	13	21%	
Exelon Corporation	Infrastructure	13	1%	
Deutsche Telekom AG	Services	12	100%	
Polska Grupa Energetyczna (PGE) SA	Power generation	12	8%	
Occidental Petroleum Corporation	Fossil fuels	11	0%	No claims
Marriott International, Inc.	Hospitality	9.2	1%	
Deutsche Bahn AG	Transportation services	9.2	53%	
Cargill	Food, beverage & agriculture	9.1	19%	
Charoen Pokphand Group	Food, beverage & agriculture	9	6%	
ZIM Shipping	Transportation services	8.6	8%	

Project age

Figure 30: Purchasing type breakdown of the RE purchasing volume for which a project age was not disclosed, a project age of greater than 15 years, and a project age of less than or equal to 15 years was disclosed (n= 4,595)



It is valuable to study the commissioning or re-powering years of projects from which RE is purchased: companies' support for RE projects that are paying off capital costs after initial construction or after significant investment into re-powering is more valuable than their support for RE projects that are debt-free. Significant global criticism of corporate RE procurement is centered on practices of making RE claims from decades-old RE projects, often large hydro projects. CDP has collected project age disclosures for RE purchases since the 2022 CDP disclosure cycle.

Only 42% of the RE purchasing volume includes commissioning year disclosure. Commissioning year disclosure is poorest for contracts with suppliers. This is expected: these purchasing arrangements are typically off-the-shelf products with low transparency. In contrast, PPAs are necessarily more transparent since an energy user and energy generator are directly contracting with each other, and a commissioning year is reported for 48% of the RE volume delivered by PPAs.

A leadership initiative for RE procurement, RE100, sets a fifteen-year limit on the age of the projects from which RE can be purchased under its rules. 29% of all reported RE purchasing is from projects commissioned in the past fifteen years, while 13% is from older projects, and 58% is unknown. RE purchasing done through PPAs is more likely to be associated with newer projects than purchasing done through contracts with suppliers or unbundled EACs.

Table 2 presents the commissioning year of the average project from which RE is purchased, split by purchasing type and region.

Table 2: Regional and purchasing type breakdown of MWh-weighted average commissioning years (n=4,595)

	PPA	Contract with supplier	Unbundled EACs	All purchase types
Asia	2011	2003	2011	2009
North America	2016	2017	2013	2013
South America	2003	2001	2002	2003
Europe	2003	2001	1982	1991
Oceania	2010	1980	2004	2008
Africa	2007	2019	2010	2010
Global	2010	2006	1997	2004

Europe is where, on average, the oldest projects from which RE is purchased are located. If considering only unbundled EAC purchases, the average project is commissioned over 40 years ago. Oceania also stands out as a region where unbundled EAC purchasing is done from exceptionally old projects. The average project from which RE100 companies currently purchase RE is commissioned in 2010, compared to the average of 2004 for the companies studied in this report.

Understanding impact

PPAs feature prominently in RE purchasing in Russia, and are held by a small number of very large electricity users in the metal smelting, refining & forming sector (including the single largest electricity users in this report's sample of companies). It is sometimes assumed that PPAs support the building of new renewable energy projects by providing long-term financial security to RE project developers. However, PPAs can also be signed with existing RE projects. Some energy users may use PPAs primarily to de-risk their electricity costs (which account for the vast majority of wthe operational costs of some metal smelting, refining & forming activities) over a long contract period. If the project is debt-free, the PPA has little impact on the project's ability to continue operating (it would be able to operate as a merchant power plant in the absence of a voluntary corporate off-taker).

Unbundled EAC purchasing is seen as a controversial way to make RE claims. Arguments are often made that unbundled procurement arrangements should cease as a practice, since companies make separate electricity purchases from electricity suppliers that supply electricity generated from fossil fuels. Some proposals argue that RE should only be delivered through bundled arrangements. However, it is important to note that:

1. financial (virtual) PPAs are themselves unbundled arrangements, and;
2. many bundled arrangements (when RE attributes and electricity are supplied in one contract to an energy user) simply conceal that an energy supplier is purchasing unbundled EACs to pair with the electricity it supplies. Given that unbundled EACs and contracts with suppliers are the only mechanisms to purchase RE accessible to the majority of companies, it is important to focus on the features of these arrangements that can make them more impactful.

Impact might be driven by setting tighter 'quality criteria' to qualify what is acceptable to make a basic claim to be using RE. Stronger time-matching and location-matching criteria (with their origins in the Scope 2 Quality Criteria provisions for 'market boundaries' and 'vintage limitations') seek to align RE purchasing and associated claims more closely with organizations' physical electricity consumption by requiring RE generation to be matched with electricity consumption on an hourly or sub-hourly basis, and for RE generation to be located on the 'same grid' as the electricity consumption. Hourly matching goes far beyond the status quo of most RE programs' requirements for annual matching, while matching on the 'same grid' can go significantly beyond the market boundaries specified by existing programs, including RE100. These approaches are being increasingly enabled by more granular grid data and the inclusion of a timestamp on EACs (instead of the existing varied approaches to simply state the week or month in which generation occurred). These approaches are appearing in some companies' voluntary RE purchasing strategies, and also in legislation in Europe and North America, where renewable hydrogen producers will follow strict rules to ensure renewable hydrogen production is credible and additional.

Beyond setting stricter criteria for what constitutes an RE claim, further criteria on what resources are acceptable to purchase RE from can be considered. These further criteria are discussed in Chapter 8 of the GHG Protocol Scope 2 Guidance. They might include setting a project age limit (like the one in use by RE100 and other voluntary RE programs) as a simple-to-follow rule. They might also include considering whether RE projects receive public subsidies (lessening any claim to impact that the voluntary RE purchaser has), or considering purchasing through incremental funding programs or ones offering an additional level of certification like the EKOenergy or Green-e programs. Renewable hydrogen legislation in Europe and North America also use project age limits to ensure renewable hydrogen production is additional.

Claims tracked by EACs

Both graphs below provide a purchasing type breakdown of reported and recognized RE purchasing that is backed by EACs.

Figure 31: Purchasing type breakdown of reported RE purchasing which was backed by EACs (n=4,595)

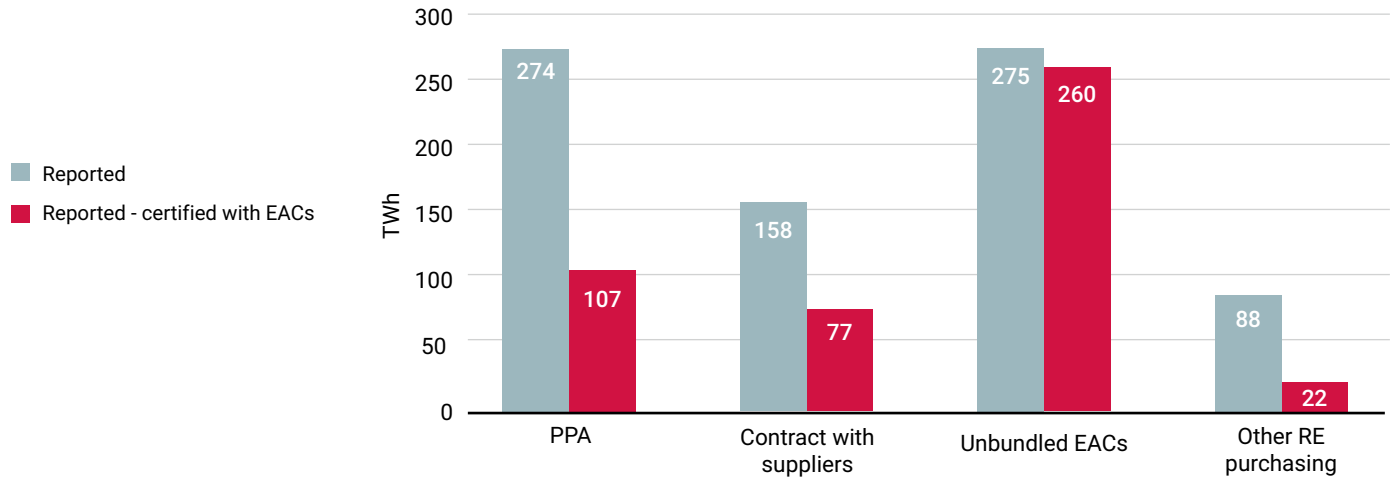
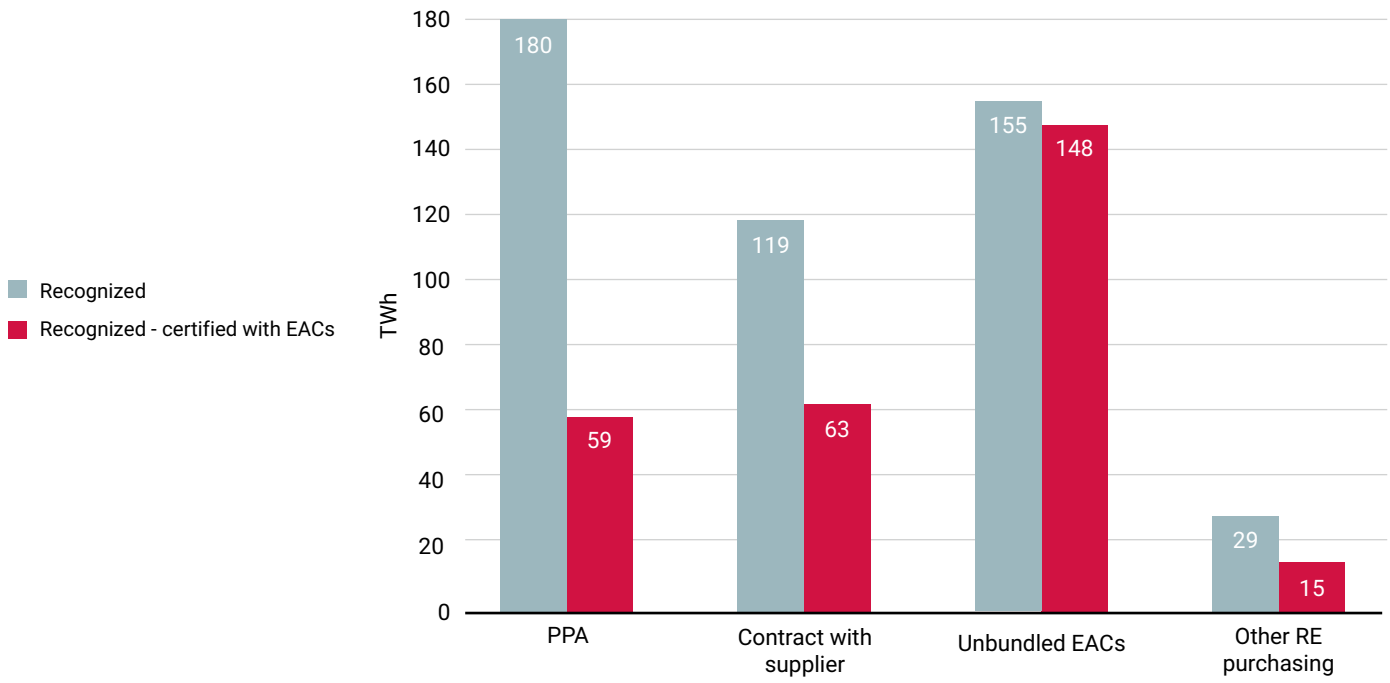


Figure 32: Purchasing type breakdown of recognized RE purchasing which was backed by EACs (n=4,595)

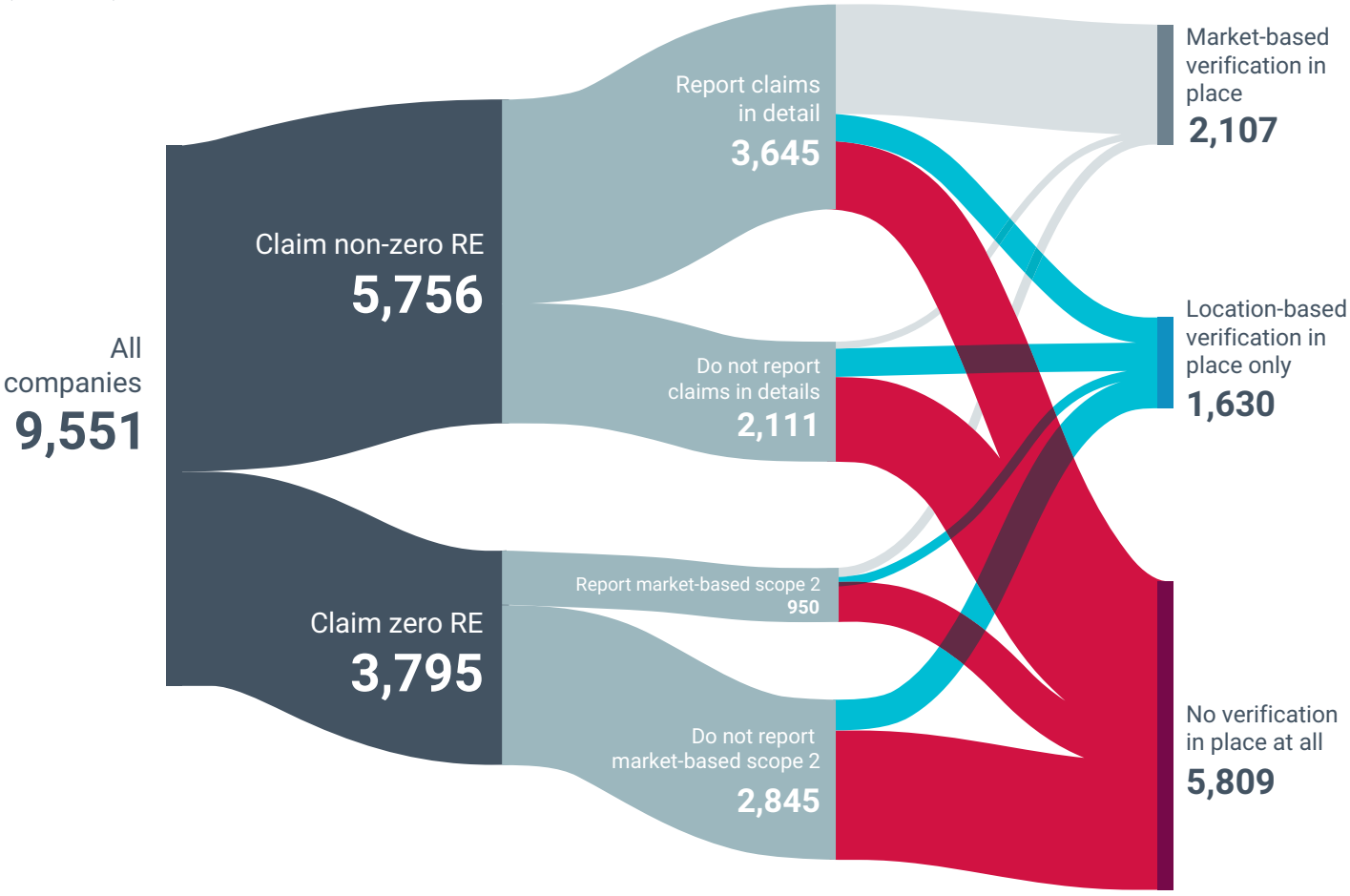


Scope 2 verification and assurance

In the absence of any third-party verification standards for RE claims, third-party verification of a market-based Scope 2 inventory can act as a proxy to verification of purchased RE use. Any company claiming to consume purchased RE must report market-based Scope 2 emissions and should have those emissions verified by a third party. Unless a company operates exclusively in countries or areas that offer no access to market-based instruments, it must report a market-based Scope 2 inventory which should also be third-party verified, even if it does not claim to use any RE. Every company studied in this report operates in at least one country or area known to offer Scope 2 market-based instruments, meaning they are expected to report a market-based Scope 2 emissions inventory.

Figure 33 shows that 61% of companies studied in this report do not currently have in place any form of third-party Scope 2 emissions verification. It also shows that companies not claiming to use RE are much more likely to not report their market-based Scope 2 emissions. Very few companies that do not claim to use RE but do report market-based Scope 2 emissions have those emissions verified. While many companies making non-zero RE claims do report market-based Scope 2 emissions, many do not have verification in place or only have their location-based Scope 2 emissions verified.

Figure 33: Quality of RE claims and market-based Scope 2 emissions reporting and third-party verification (n=9,551)[3]



5 CDP 2023 questionnaire design is such that the 'report claims in detail' category represents companies that report a market-based Scope 2 total and are therefore invited to give details on the contractual instruments they used to claim market-based Scope 2 (equivalent to their detailed RE claims). It also contains members of the RE100 initiative, which give detailed RE disclosures irrespective of whether they disclose a market-based Scope 2 total or not. The 'do not report claims in detail' category therefore contains companies that are neither RE100 member companies nor report market-based Scope 2 emissions.

Figures 34 and 35 detail the level of Scope 2 emissions verification sought by companies.

Figure 34: Breakdown of the level of Scope 2 emissions verification that companies report having sought.

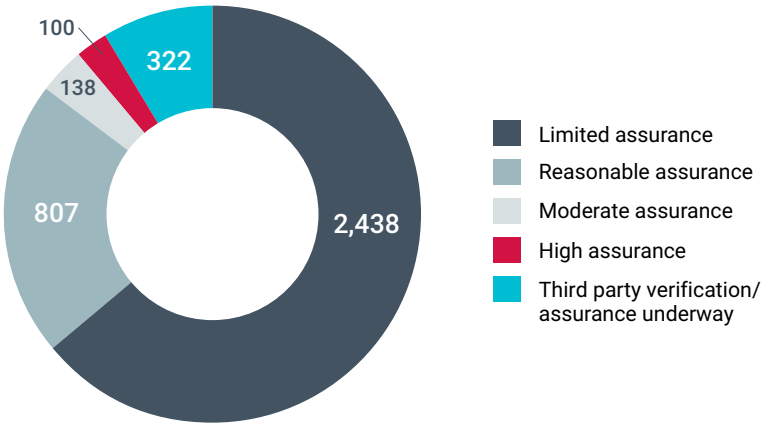
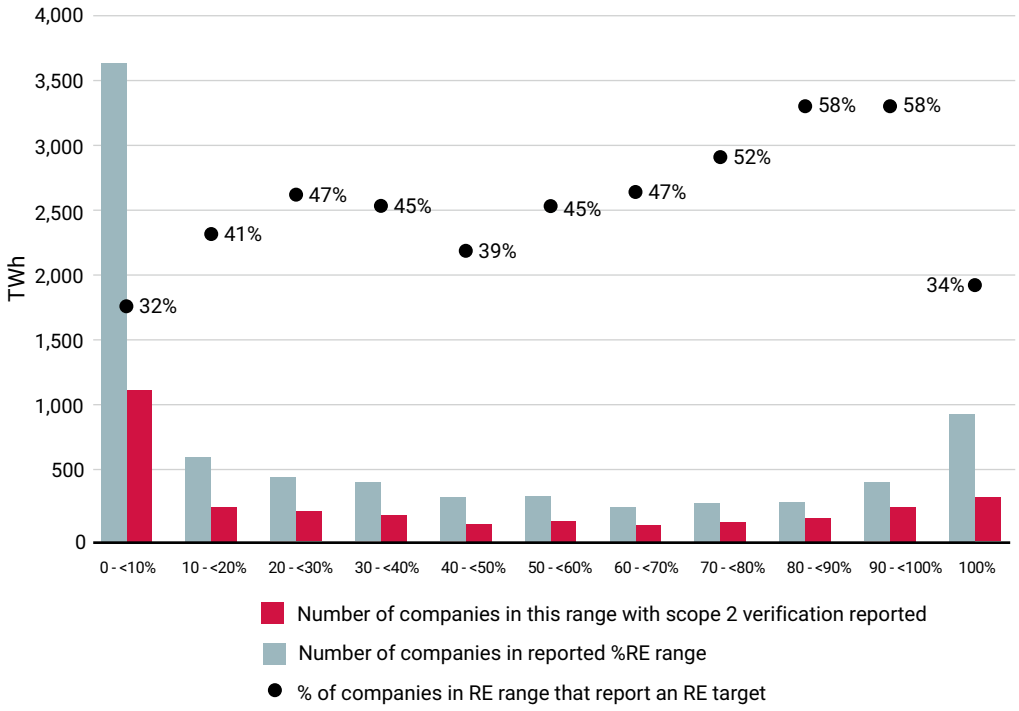


Figure 35: Breakdown of the percentage of companies that sought verification or assurance in relation to their Scope 2 emissions reporting, across different ranges of reported % RE (n= 9,551)



This graph shows a broad trend whereby the greater the % RE that companies report purchasing, the more likely they are to have Scope 2 emissions verification or assurance in place. This trend breaks for companies that report purchasing 100% RE. Only 34% of companies that report purchasing 100% RE have some form of Scope 2 emissions verification in place.

Scope 2 emissions reduction initiatives

3

Image source: 2024 Google Earth

Scope 2 emissions reduction initiatives

Thus far, this report has only studied the detail in one year of companies' electricity and RE purchasing. This section explores expected trends in RE purchasing and energy efficiency by considering companies' energy-related targets.

RE consumption targets

Over 75% of the electricity purchasing studied in this report comes from companies that set no target to consume more RE. Only 936 companies set 100% RE targets.

The MWh-weighted average target year for the 936 companies setting 100% RE targets is 2033. These companies currently report 53% RE. In comparison, the RE100 initiative of over 400 companies currently maintains a MWh-weighted average target year of 2035, and currently reports 50% RE. It is important to note that RE100 purposefully recruits companies in markets and sectors that face greater barriers to RE purchasing and therefore set their targets further into the future, and that nearly 70% of the 936 companies with 100% RE targets studied in this report are headquartered in Europe or North America where RE is easier to procure (in contrast to only 57% of current RE100 membership).

Figure 36: RE target setting (count of companies basis) (n= 9,551)

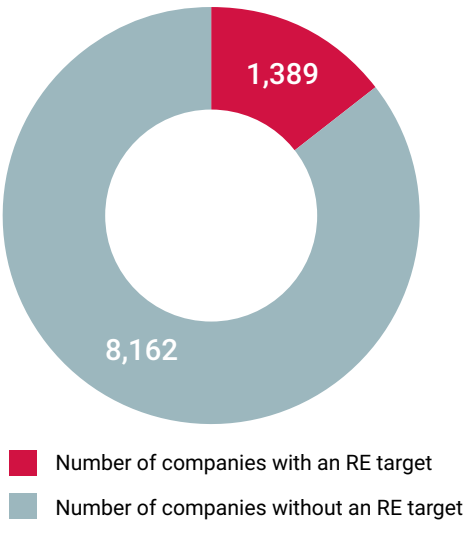


Figure 37: RE target setting (TWh basis), showing level of ambition (n=9,551)

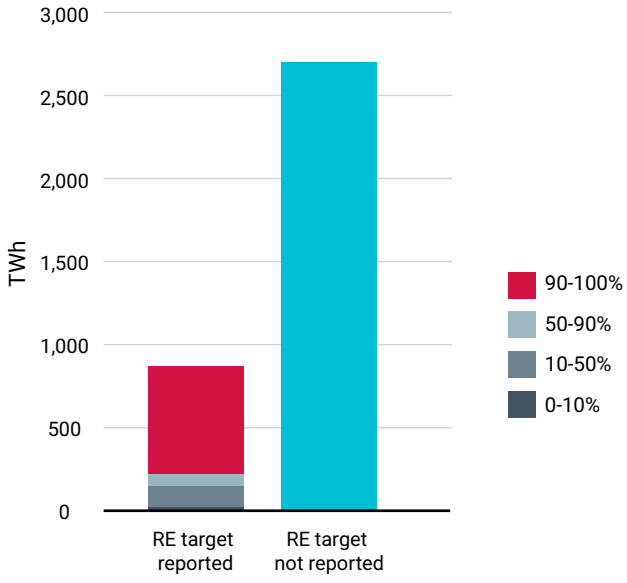
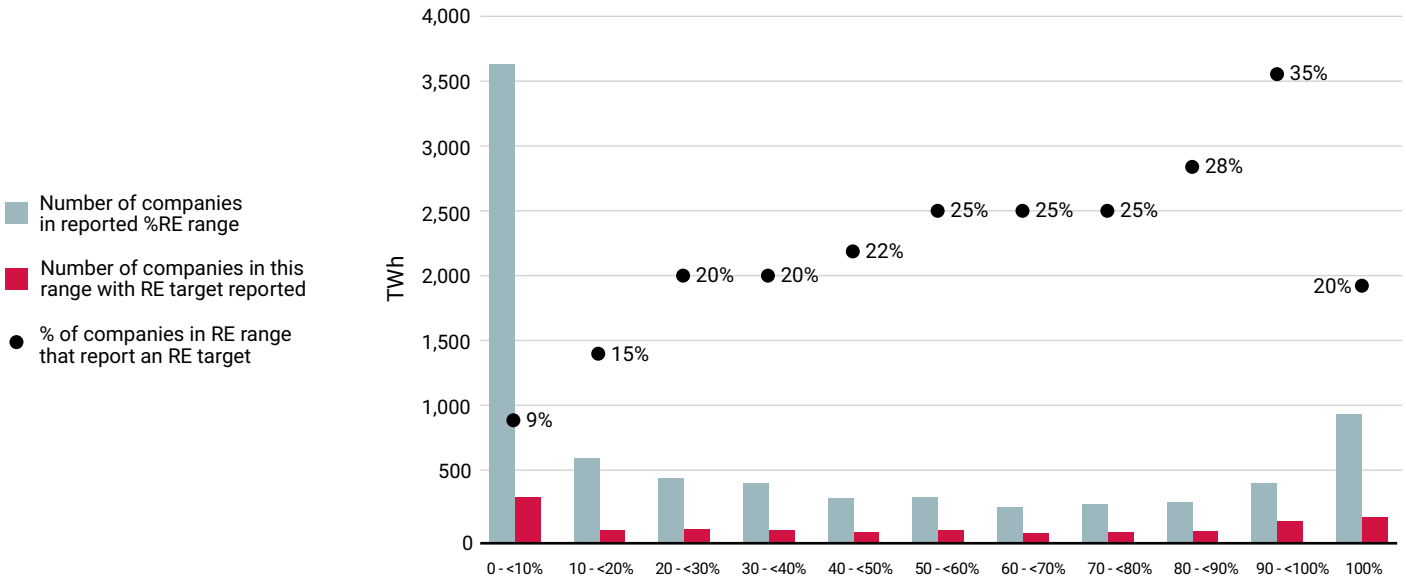


Figure 38 shows that ambitions to consume more RE in the future are correlated with higher reported % RE performance today.

The prevalence of RE target setting across different primary industries is shown in Figure 39. 22% of companies in the apparel industry report an RE target. This is the highest proportion out of all industries in the sample.

Figure 38: Breakdown of the percentage of companies that reported an RE target, across different ranges of reported % RE (n= 9,551)



Larger users are more likely to set RE targets.

Figure 39: Industry breakdown of the number of companies reporting an RE purchasing target (n= 9,551)

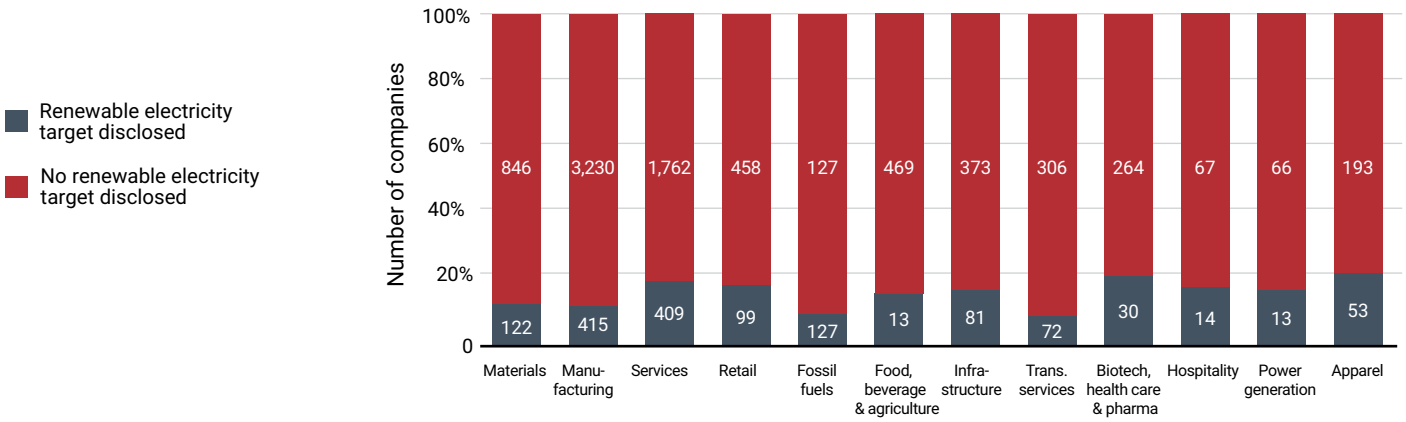
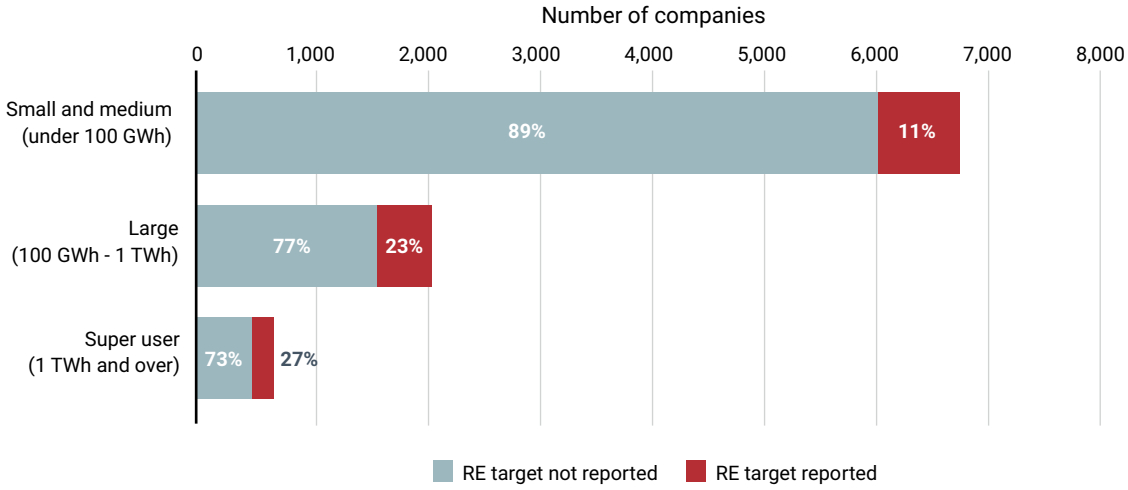


Figure 40: Breakdown of the rate of RE target reporting by electricity consumers of different sizes (n= 9,551)



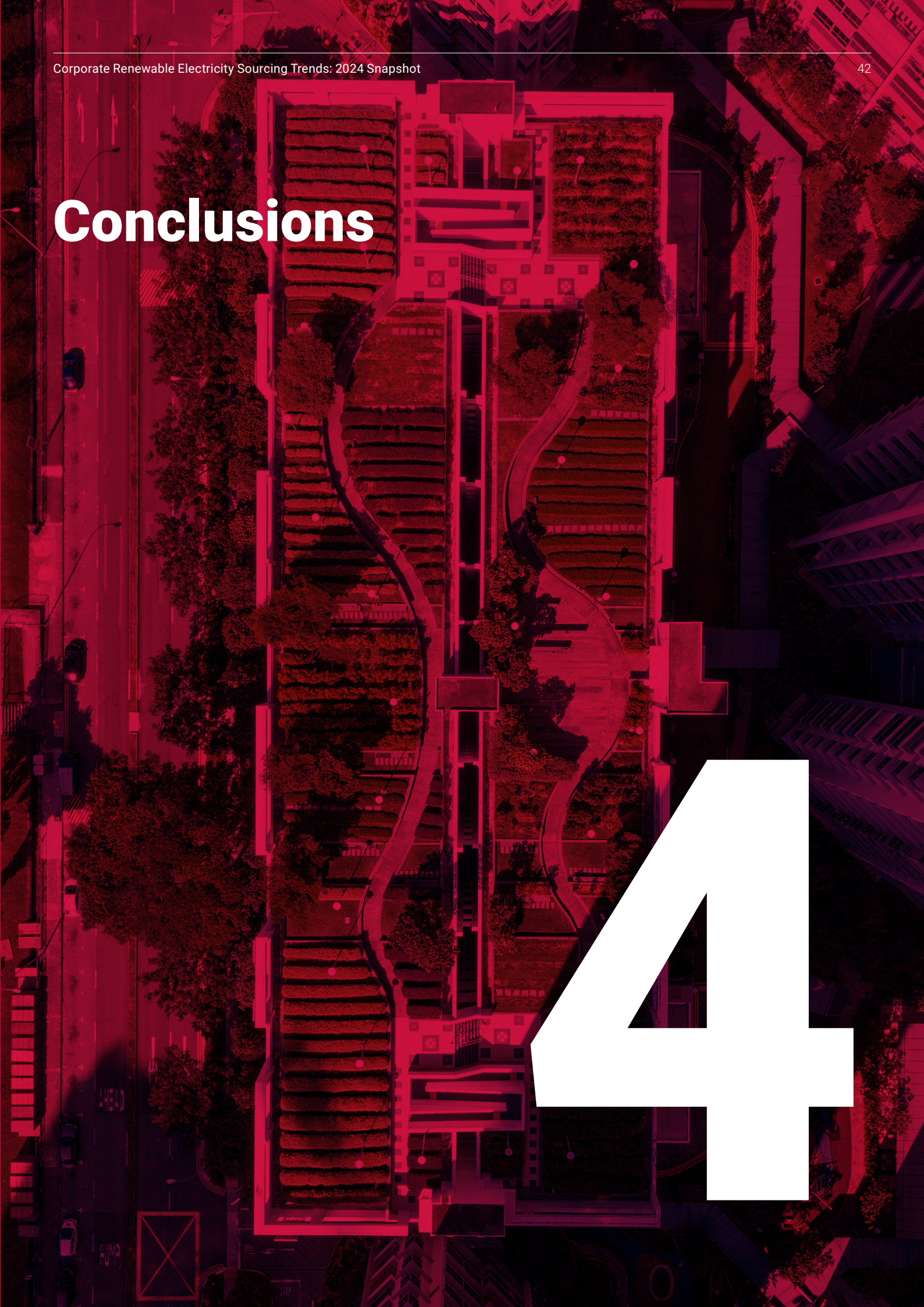
Energy efficiency targets

Only 433 of the 9,551 companies (under 5%) report setting an energy efficiency target.

Table 3: Prevalence of energy efficiency targets across industries.

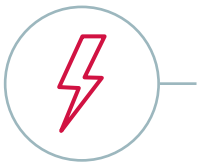
Industry	Number of companies declaring energy efficiency targets	As share of all companies in industry
Apparel	6	2%
Biotech, health care & pharma	16	5%
Food, beverage & agriculture	22	4%
Fossil fuels	6	4%
Hospitality	3	4%
Infrastructure	16	4%
International bodies	0	0%
Manufacturing	166	5%
Materials	65	7%
Power generation	0	0%
Retail	18	3%
Services	108	5%
Transportation services	7	2%

Conclusions



4

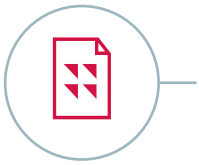
Conclusions



1

CDP has significant coverage of electricity demand and captures some of the single largest electricity users.

Companies reporting to CDP on their electricity use and location-based Scope 2 emissions account for roughly 13% of global electricity demand. Considering that industrial and commercial electricity users represent upwards of 50% of global electricity demand, this report covers up to a quarter of all commercial and industrial electricity use. Demand is significantly concentrated in a small number of super-users. 7% of companies studied account for more than three-quarters of the electricity purchasing represented by the entire group. The ten largest electricity users (0.1% of the companies studied) account for 10% of the electricity purchasing represented by the entire group.



2

Companies' current RE claims lack ambition.

The group studied in this report currently collectively reports 29% RE purchasing; below the share of renewable resources in global electricity generation today. Four in ten companies do not claim to be using any RE, while the six in ten collectively claim 35% RE overall. Larger electricity users have a greater tendency to claim to be using RE compared to smaller ones.

3

Woefully few companies set RE and energy efficiency targets.

Three-quarters of the electricity purchasing studied in this report is associated with companies that set no targets to increase their RE consumption. The International Energy Agency (IEA) has found that the global goal to triple renewable energy capacity between 2022 and 2030 is not on track, even if renewable resources are being deployed so fast that they are out-pacing governments' own existing targets. Greater ambition from companies, along with greater ambition from governments, could get the 2030 goal back on track. Fewer than 5% of companies studied declare a target to increase their energy efficiency.

4

Only around half of companies' claims include essential information to understand their mechanisms and credibility, and impact is difficult to quantify.

While companies report 29% RE, only 16% RE is supported by country/area level disclosures and information about the mechanism used to make the claim (eg PPA, contract with supplier, or unbundled EAC purchase). Some companies make claims that are not credible, for example, by claiming from the grid mix, or by making claims that do not observe market boundaries.

Unbundled EACs contribute the greatest volume of RE claims (35% of the RE volume claimed where companies submitted detailed information). PPAs deliver only slightly less RE (34%), but are in use by far fewer companies, most of which are super users. While discussions of voluntary RE procurement often seek to attribute differing degrees of impact to different purchasing types, this report attempts to present a more nuanced view by highlighting that not all PPAs are necessarily responsible for the operation of the RE project they are with. Unbundled EACs and contracts with suppliers remain the primary mechanisms most accessible to companies to purchase RE. In the absence of direct contracting between energy users and new RE projects, impact in voluntary RE procurement through unbundled EAC purchases and contracts with suppliers is dependent on the overall participation and demand of companies in these markets. Given the 29% RE claimed overall, and the lack of target setting, participation appears to be low. Another means to improve impact (by developing stronger and more specific price signals) is instead to constrain supply by limiting what RE projects companies can purchase RE from (see Understanding impact). The National Renewable Energy Laboratory (NREL) and Clean Kilowatts have highlighted a need for more research into how the voluntary RE market's impact can be understood.

5

Third party verification of instruments used to make RE claims is lacking.

RE claims are made with the same instruments used to reduce a company's market-based Scope 2 emissions inventory. In a universe of companies operating in different markets, the roles of third-party verifiers are essential in making companies' claims comparable and trustworthy. This report has shown that, first, many companies fail to report a market-based Scope 2 inventory entirely. This failure is much more common where companies make no claims to be using RE. However, a company's decision to purchase RE or not has no impact on its requirement to report a market-based Scope 2 inventory: virtually all companies, unless they operate exclusively in countries or areas that offer no access to market-based instruments, must report a market-based Scope 2 inventory. Second, only 22% of companies studied have some form of third-party verification in place for their market-based Scope 2 emissions.

6

Mandatory disclosure is broadening the energy-related statutory disclosure requirements on companies.

Mandatory disclosure regulation continues to grow in scope. In Europe, the European Sustainability Reporting Standard for Climate Change (ESRS E1) specifies disclosure of both location and market-based Scope 2 emissions, energy and renewable energy consumption, and associated targets. The U.S. Securities and Exchange Commission (SEC) will implement similar disclosure rules, which, while excluding energy consumption as a reporting requirement, do mention that disclosers must describe if and how EACs are used in their Scope 2 emissions reporting. It may also include a requirement for a third-party assurance statement, at the limited level.

Companies responding to CDP are better placed to respond to future disclosure regulation and the increased scrutiny from investors this brings. Beyond energy, CDP has published principles for high-quality mandatory disclosure, aimed at supporting policymakers and financial markets regulators to mandate the most robust and impactful environmental disclosure regulation.

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About CDP

CDP is a global non-profit that runs the world's environmental disclosure system for companies, cities, states, and regions. Founded in 2000 and working with over 700 financial institutions representing more than US$142 trillion in assets. CDP pioneered using capital markets and corporate procurement to motivate companies to disclose their environmental impacts, and to reduce greenhouse gas emissions, safeguard water resources and protect forests. Over 24,000 organizations around the world disclosed data through CDP in 2023, including more than 23,000 companies worth two thirds global market capitalization, and over 1,100 cities, states, and regions. Fully TCFD aligned, CDP holds the largest environmental database in the world, and CDP scores are widely used to drive investment and procurement decisions towards a zero carbon, sustainable and resilient economy. CDP is a founding member of the Science Based Targets initiative, We Mean Business Coalition, The Investor Agenda, and the Net Zero Asset Managers initiative. Visit cdp.net or follow us @CDP to find out more.