# **CDP SCORE REPORT - CLIMATE CHANGE 2020**



#### **QUALITY TECHNOLOGY SERVICES**

**Region** North America

Country United States of America

**Questionnaire** General

Activity Group Media, telecommunications & data center

services

The CDP Score Report allows companies to understand their score and indicate which categories require attention to reach higher scoring levels. This enables companies to progress towards environmental stewardship through benchmarking and comparison with peers, in order to continuously improve their climate governance. Investors will additionally receive a copy of the CDP Score Report upon request. For further feedback please contact your account manager or your key CDP contact.

# Your CDP score







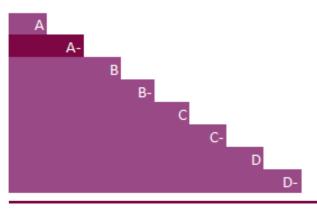


Media, telecommunication s & data center services

**North America** 

Global Average

#### UNDERSTANDING YOUR SCORE REPORT



QUALITY TECHNOLOGY SERVICES received a A- which is in the Leadership band. This is higher than the North America regional average of D, and higher than the Media, telecommunications & data center services sector average of B.

Leadership (A/A-): Implementing current best practices

Management (B/B-): Taking coordinated action on climate issues

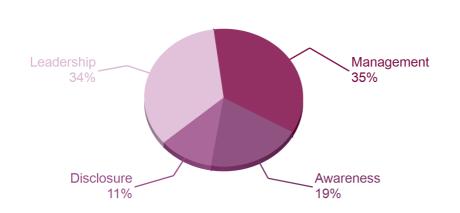
Awareness (C/C-): Knowledge of impacts on, and of, climate issues

Disclosure (D/D-): Transparent about climate issues

#### **ACTIVITY GROUP PERFORMANCE**

Media, telecommunications & data center services

Your company is amongst 34% of companies that reached Leadership level in your Activity Group



A sample of A-list companies from your Activity Group:

Bolloré SA

BT Group

Deutsche Telekom AG

Hewlett Packard Enterprise Company

Koninklijke KPN NV (Royal KPN)

# **CDP SCORE REPORT - CLIMATE CHANGE 2020**

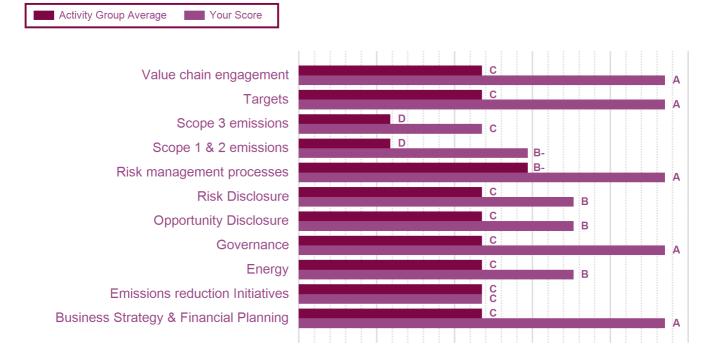


# **CATEGORY SCORES**



If a company scored C or below, they will not have been scored for management or leadership points (the dark purple line represents this). Please download the <u>'CDP Scoring Introduction'</u> for more information.

#### CATEGORY SCORES BENCHMARKING



Scenario analysis No, but we anticipate using qualitative and/or quantitative analysis in the next two years

Each category score in the bar chart represents the progression within each scoring level. Some categories have not been included for category score breakdown as either not enough questions feed into these categories to give a representative score or they are not scored at Management and Leadership levels.

Scoring categories are groupings of questions by topic. They are sub-groups of the 2020 questionnaire modules and are consistent across all sectors. Weighting applied to each category varies across sectors to highlight the areas most important to environmental stewardship in specific sectors. To find out more about category weightings for each sector, please download the 'CDP Scoring Categories and Weighting' documents.

# **QUALITY TECHNOLOGY SERVICES - Climate Change 2020**

# C0. Introduction

#### C<sub>0.1</sub>

#### (C0.1) Give a general description and introduction to your organization.

QTS Realty Trust, Inc. (NYSE: QTS) is a leading provider of data center solutions across a diverse footprint spanning more than 7 million square feet of owned mega scale data center space within North America and Europe. Through its software-defined technology platform, QTS is able to deliver secure, compliant infrastructure solutions, robust connectivity and premium customer service to leading hyperscale technology companies, enterprises, and government entities. Visit QTS at www.qtsdatacenters.com, call toll-free 877.QTS.DATA or follow on Twitter @DataCenters\_QTS. In 2018 QTS formally and publicly declared our intent to procure 100% of our energy from renewable sources by 2020, and today we are about 1/3 of the way to reaching this goal.

#### C0.2

#### (C0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date		Select the number of past reporting years you will be providing emissions data for
Reporting year	,	Decembe r 31 2019	No	<not applicable=""></not>

# C<sub>0.3</sub>

#### (C0.3) Select the countries/areas for which you will be supplying data.



#### C<sub>0.4</sub>

(C0.4) Select the currency used for all financial information disclosed throughout your response. **USD** 

# C<sub>0.5</sub>

(C0.5) Select the option that describes the reporting boundary for which climate-related impacts on your business are being reported. Note that this option should align with your chosen approach for consolidating your GHG inventory.

Operational control

#### C1. Governance

## C1.1

(C1.1) Is there board-level oversight of climate-related issues within your organization? Yes

#### C1.1a

(C1.1a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for climate-related issues.

Position of individual(s)	Please explain
Board Chair	QTS' CEO and Chairman of the Board of Directors leads the ESG team, and approves all strategies, tactical operations, and communications having to do with ESG. As an example, the Board chairman worked with the ESG team to set a goal to procure 100% of the company's energy from renewable resources by 2025, approved the strategy to make this happen, and made the ultimate decision to join RE100 as the 188th member. The chairman then reviewed and approved all press releases and public



Position of individual(s)	Please explain
Other, please specify (Vice President - Energy and Sustainability)	The Vice President of Energy and Sustainability reports the company's ESG goals and initiatives progress to the full board of directors quarterly, through oversite from the Governance committee.

# C1.1b

# (C1.1b) Provide further details on the board's oversight of climate-related issues.

Frequency with which climate- related issues are	Governance mechanisms into which climate-related issues are integrated	Scope of board- level oversight	Please explain
climate-	climate-related	oversight	
related	issues are		
issues are	integrated		
а			
scheduled			
agenda			
item			



			CDP
Frequency with which climate- related issues are a scheduled agenda item	Governance mechanisms into which climate-related issues are integrated	Scope of board- level oversight	Please explain
Scheduled – all meetings	Reviewing and guiding strategy Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding annual budgets Reviewing and guiding business plans Setting performance objectives Monitoring implementation and performance of objectives Overseeing major capital expenditures, acquisitions and divestitures Monitoring and overseeing progress against goals and targets for addressing climate-related issues	<not Applicabl e&gt;</not 	The presentation to the full board of directors always includes a section that describes progress on renewable energy procurement and carbon emissions goals. Trends are tracked and the strategy for the next 4 quarters is discussed. Climate change risk is widely accepted as the rationale for the ESG program, so much of the discussion revolves around legislative initiatives that QTS can support and comply with. Performance objectives are reviewed and adjusted as needed. As an example, QTS set a goal to recycle 600 Million lbs. of material by 2025. We met this goal within the first year, and through board level guidance settled on a new goal to recycle 90% of all operational waste by 2025.

# C1.2



Name of the position(s) and/or committee(s)	Reporting line	Responsibility	Coverage of responsibility	Frequency of reporting to the board on climate-related issues
Chief Executive Officer (CEO)	<not Applicabl e&gt;</not 	Both assessing and managing climate-related risks and opportunities	<not Applicable&gt;</not 	Quarterly
Other, please specify (Vice President - Energy and Sustainability)	<not Applicabl e&gt;</not 	Both assessing and managing climate-related risks and opportunities	<not Applicable&gt;</not 	Quarterly
Sustainability committee	<not Applicabl e&gt;</not 	Both assessing and managing climate-related risks and opportunities	<not Applicable&gt;</not 	Quarterly

# C1.2a

(C1.2a) Describe where in the organizational structure this/these position(s) and/or committees lie, what their associated responsibilities are, and how climate-related issues are monitored (do not include the names of individuals).

The CEO and Chairman of the Board is the highest level executive in the company. He holds oversight of critical operations, as well as tactical, and strategic decisions. QTS firmly believes that sustainability and climate change is among the most important factors to the health of our business, our employees, our customers, and our communities, and as such our CEO has developed an incredible ESG team of passionate and capable employees that he personally leads.

#### C1.3

# (C1.3) Do you provide incentives for the management of climate-related issues, including the attainment of targets?

	Provide incentives for the management of climate-related issues	Comment
Row 1	Yes	The VP of Energy and Sustainability is judged annually on the performance to climate related goals. Financial incentives are tied to these goals. Additionally, QTS supports the broader community of employees through ESG related programs. One example is our partnership with



# C1.3a

# (C1.3a) Provide further details on the incentives provided for the management of climate-related issues (do not include the names of individuals).

Entitled to incentive	Type of incentive	Activity inventivized	Comment
Board Chair	Non- monetary reward	Company performance against a climate- related sustainability index	QTS and the board of directors actively monitors the company's performance against CDP scoring, the Sustainalytics, MSCI, EcoVadis, and GRESB. The company's overall reputation with the our stakeholders and the broader investment community depend on these ratings, and as such the CEO understands that it is his responsibility to perform well here.
Environment/Sustainability manager	Monetary reward	Emissions reduction target	The Vice President of Energy and Sustainability is responsible to contract every site to 100% renewable energy by 2025. There are milestone targets along the way that he is responsible to hit, which can positively or negatively impact earnings.

# C2. Risks and opportunities

# C2.1

(C2.1) Does your organization have a process for identifying, assessing, and responding to climate-related risks and opportunities?

Yes

# C2.1a

# (C2.1a) How does your organization define short-, medium- and long-term time horizons?

	From (years)	To (years)	Comment
Short-term	1	2	
Medium-term	2	10	



# C2.1b

# (C2.1b) How does your organization define substantive financial or strategic impact on your business?

QTS is made up of a relatively small number of very large data center sites, in an industry where profit margins are under incredible competitive pressure. One of the ways we have decided to differentiate ourselves from our competition is to take a strong position on Environmental, Social, and Governance issues. To this end, QTS defines a substantive financial or strategic impact as one that would have the potential for customer concern at one single site in the company's portfolio. Every single customer in every single data center is critically important to us. So much so that we hold quarterly business reviews with our customers and regularly adapt our strategic policies based on the needs of our customers. Recent examples are partnering with our customers on energy efficiency projects, providing letters of attestation for REC Retirement, and following the Corporate Colocation and Cloud Buyers Principles that define the need for Options, Data, Incentives, Collaboration, Disclosure, and Advocacy.

At QTS we recognize that physical risks including the frequency and intensity of storms, floods, and droughts can have a severe impact on business operations. for this reason, we also define a substantive financial or strategic impact through an uptime assessment. We have a goal of 99.999% uptime, and we can only reach this goal through rigorous risk management. If a facility fails for more than 5 minutes in a year, we will not reach our goal and it is considered a substantive impact that has strategic implications on the business. Facilities and systems are designed to eliminate the risk of severe weather events through UPS battery backup systems, on-site backup generators, and facilities that are designed to be direct hit by a category 3 tornado. We build only outside of flood plains, and require multiple utility feeds to the site.

#### C2.2

(C2.2) Describe your process(es) for identifying, assessing and responding to climate-related risks and opportunities.

Value chain stage(s) covered

Direct operations

Upstream

Downstream



#### Frequency of assessment

More than once a year

#### Time horizon(s) covered

Short-term Medium-term Long-term

#### **Description of process**

QTS builds, owns and operates large scale colocation data centers that provide space for our customers to place their own computing equipment. We manage the power, cooling, security, building envelope, emergency response, and connectivity to provide a completely seamless experience for our customers to operate 24x7x365. We very clearly understand that our climate is changing, and when we build an asset that is intended to be in operation for 30-50 years, we have to build it to withstand the conditions that will be in place not just today, but in the future as well. This risk mitigation example refers to how we assess the climate related risk to our assets before development of the asset even begins. The result is a downstream benefit for our customers. 1-2 times per year we will build a new data center, and often times in a new market. Most recently we used our standard evaluation process while selecting property in the San Antonio, TX market. The site selection process used to find new property includes a multidisciplinary team that carefully reviews and scores hundreds of line items that include but are not limited to wetland interference, weather patterns, utility infrastructure, risk of floods, earthquakes, tornados, hurricanes, landslides, and wildfires. We review the access to renewable power, the relationship with state and local government groups, any special environmental requirements, and animal habitats.

#### Value chain stage(s) covered

Direct operations Upstream

#### Risk management process

Integrated into multi-disciplinary company-wide risk management process

#### Frequency of assessment

More than once a year

#### Time horizon(s) covered

Short-term Medium-term Long-term

#### **Description of process**

In every market where we operate, one of the largest and most influential suppliers we have is our electric utility supplier. This relationship is managed through a key account manager who is a conduit for information, and we meet on a quarterly basis to discuss their risk



> Dominion Energy in Virginia to block passage of a new tariff that would have cut off the opportunity for smaller customers to procure renewable energy. We see policy change as a large potential risk to our ability to have a meaningful impact on climate change, and as such, we stay engaged with our elected officials.

### Value chain stage(s) covered

Direct operations

Downstream

#### Risk management process

Integrated into multi-disciplinary company-wide risk management process

#### Frequency of assessment

More than once a year

#### Time horizon(s) covered

Short-term

Medium-term

Long-term

#### **Description of process**

At QTS we recognize that climate change is occurring, and that water is more and more becoming a scarce resource. Droughts, wildfires, and mismanaged resources will continue to have an impact on our business. To this end, we have developed and rolled out a new product that we refer to as our Water FREEdom design. While data centers are most commonly designed to use significant amounts of water for cooling, we have designed a data center that uses 100% dry cooling solutions so that our direct consumption of water is limited to only domestic use. We pair this design with 100% renewable energy sourced from Solar or Wind, and it is a virtually water free system. This design has been implemented in our Hillsboro, OR and Chicago, IL designs, and will be next developed in Ashburn, VA and Atlanta GA.

## Value chain stage(s) covered

Direct operations

Upstream

#### Risk management process

Integrated into multi-disciplinary company-wide risk management process

#### Frequency of assessment

More than once a year

#### Time horizon(s) covered

Medium-term

Long-term



> The Climate change discussion has massive implications on government policy, and QTS fully recognizes this. We often times see fragmented, overlapping, and burdensome policy that may start with good intent, but in reality has minimal impact on meaningful change, and poses potential risk to business operations. For this reason, QTS takes a strong leadership role in advancing energy policy. We are members of the policy committee for REBA, we sit on the energy committee for the Data Center Coalition, and our Vice President of Energy and Sustainability regularly speaks at utility conferences. Three recent examples are the EUCI Utilities and Data Centers conference, the Mountain West Renewables Conference, and the CES Europe conference.

# Value chain stage(s) covered

Direct operations Upstream

Downstream

#### Risk management process

Integrated into multi-disciplinary company-wide risk management process

#### Frequency of assessment

More than once a year

#### Time horizon(s) covered

Short-term Medium-term Long-term

#### **Description of process**

The Sustainability Leadership Team is comprised of members from a variety of departments including people services, finance, product management, stakeholder marketing and communications, and operations. Additionally, executive members include the company CEO and Vice President of Energy and Sustainability. This team meets weekly to discuss strategy and implementation of ongoing projects. Scope of responsibility for this team includes: Climate-related transition risks | Physical risks | Social risks The process includes communications I Presentations or briefings I Briefing documents for review by the Board of Directors The materials from the communication and review process are disclosed to: 11 The public | Investors upon request | Other stakeholders upon request

#### Value chain stage(s) covered

Direct operations Upstream Downstream

#### Risk management process



More than once a year

# Time horizon(s) covered

Short-term Medium-term Long-term

#### **Description of process**

QTS is actively engaged with a number of frameworks that facilitate the assessment and continued review of climate-related transition risks including GRESB, CDP and ISSOekom. Additionally, QTS analyses and incorporates the results of public rating systems such as Sustainalytics and MSCI into the overall strategy as related to climate-related transition risk for the entity.

# C2.2a

# (C2.2a) Which risk types are considered in your organization's climate-related risk assessments?

	Relevance & inclusion	Please explain
Current regulation	Relevant, always included	We hire local experts to advise us on both current and emerging regulations. We have a Board committee dedicated to risk analysis throughout the portfolio, that includes climate risk management.
Emerging regulation	Relevant, always included	The Climate change discussion has massive implications on government policy, and QTS fully recognizes this. We often times see fragmented, overlapping, and burdensome policy that may start with good intent, but in reality has minimal impact on meaningful change, and poses potential risk to business operations. For this reason, QTS takes a strong leadership role in advancing energy policy. We are members of the policy committee for REBA, we sit on the energy committee for the Data Center Coalition, and our Vice President of Energy and Sustainability regularly speaks at utility conferences. Three recent examples are the EUCI Utilities and Data Centers conference, the Mountain West Renewables Conference, and the CES Europe conference.
Technology	Relevant, always included	Our data centers are on the cutting edge of the most energy and water efficient in the world, and our procurement group holds quarterly reviews with our major suppliers to discuss ways to reduce energy consumption through technology improvements. We also adhere to a strict Sustainable Procurement Policy that can be found here: https://www.qtsdatacenters.com/-/media/files/sustainable-procurement-policy-statement.ashx
Legal	Relevant, sometimes included	We have contracts with our customers that sometimes stipulate things like what type of renewable energy is acceptable, and what kinds of data must be supplied on a regular basis.
Market	Relevant, always included	ESG requirements have become paramount in customer acquisition. It is absolutely critical that our sustainability policies and climate change risk management structures align with our customers' views. So multiple times per year we evaluate our own sustainability policies against current market trends and adjust as needed.



	Relevance & inclusion	Please explain
Reputation	Relevant, always included	In 2018 QTS decided to be one of the first data center companies to publish a stand alone ESG report and make it public. We did this because we understand the importance of the company's reputation, and the need to influence others to do the right thing. This report is now published annually, and can be found here: https://www.qtsdatacenters.com/resources/brochures/esg-initiatives-2019
Acute physical	Relevant, always included	QTS builds, owns and operates large scale colocation data centers that provide space for our customers to place their own computing equipment. We manage the power, cooling, security, building envelope, emergency response, and connectivity to provide a completely seamless experience for our customers to operate 24x7x365. We very clearly understand that our climate is changing, and when we build an asset that is intended to be in operation for 30-50 years, we have to build it to withstand the conditions that will be in place not just today, but in the future as well. This risk mitigation example refers to how we assess the climate related risk to our assets before development of the asset even begins. The result is a downstream benefit for our customers. 1-2 times per year we will build a new data center, and often times in a new market. Most recently we used our standard evaluation process while selecting property in the San Antonio, TX market. The site selection process used to find new property includes a multidisciplinary team that carefully reviews and scores hundreds of line items that include but are not limited to wetland interference, weather patterns, utility infrastructure, risk of floods, earthquakes, tornados, hurricanes, landslides, and wildfires. We review the access to renewable power, the relationship with state and local government groups, any special environmental requirements, and animal habitats. The result is a customized building that is designed to withstand the most extreme expected weather events, and has the flexibility to adapt in the future.
Chronic physical	Relevant, always included	Rising sea levels are one reason that we do not locate data centers on or near the coastline.

# C2.3

(C2.3) Have you identified any inherent climate-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes

# C2.3a

(C2.3a) Provide details of risks identified with the potential to have a substantive financial or strategic impact on your business.

**Identifier** 

Risk 1



# Risk type & Primary climate-related risk driver

Technology Substitution of existing products and services with lower emissions options

# Primary potential financial impact

Increased indirect (operating) costs

# Climate risk type mapped to traditional financial services industry risk classification <Not Applicable>

#### Company-specific description

Data centers require huge cooling systems to keep the servers from overheating. As much as 40% of the cost of the electricity supplied to the building can go toward cooling. We evaluate the Power Utilization Effectiveness on a real time basis, and we use this data to evaluate new, more efficient equipment. When it makes a material difference, we will swap out older, less efficient equipment with newer equipment, thereby reducing the electrical load on the building.

#### Time horizon

Medium-term

#### Likelihood

Virtually certain

#### Magnitude of impact

Low

# Are you able to provide a potential financial impact figure?

Yes, an estimated range

#### Potential financial impact figure (currency)

<Not Applicable>

# Potential financial impact figure – minimum (currency)

100000

#### Potential financial impact figure – maximum (currency)

200000

### **Explanation of financial impact figure**

We can assume a 1% efficiency improvement on a 30MW load. At \$55/MWH, this comes to about \$144,540 per year. 30MW x 24 x 356 = 262,800MWH x \$55/MWH average = \$14,454,000 x 1% = \$144,540 in savings

#### Cost of response to risk

3000000

#### Description of response and explanation of cost calculation

A typical data center will have shout EO cooling units that would need to be replaced at a



> We will most often look for a 2-3 year payback if the system is not at end-of-life. This approach works very well for older facilities, and can even have better payback.

#### Identifier

Risk 2

# Where in the value chain does the risk driver occur?

Upstream

# Risk type & Primary climate-related risk driver

Emerging regulation | Carbon pricing mechanisms

#### Primary potential financial impact

Increased indirect (operating) costs

# Climate risk type mapped to traditional financial services industry risk classification <Not Applicable>

# Company-specific description

QTS has already committed to procure 100% of its energy from renewable sources, however in some markets, we see legislation on the horizon that will charge a carbon tax regardless of the source of our power.

#### Time horizon

Medium-term

# Likelihood

More likely than not

#### Magnitude of impact

Medium-low

#### Are you able to provide a potential financial impact figure?

Yes, an estimated range

#### Potential financial impact figure (currency)

<Not Applicable>

#### Potential financial impact figure – minimum (currency)

#### Potential financial impact figure – maximum (currency)

6000000

#### **Explanation of financial impact figure**

A typical assumption is that where carbon tax is instituted, it will cost about \$20 per MWH of electricity. A 30MW data center would spend an additional \$5,256,000 per year on electricity.



0

# Description of response and explanation of cost calculation

There is no additional incremental cost to working with our legislators to ensure voluntary renewable energy is excluded from the cost of carbon.

#### Comment

Placing a carbon tax on renewable energy would have an adverse effect on renewable energy procurement. The concept is to encourage renewable energy procurement through raising the price of fossil fuel generated electricity.

#### **Identifier**

Risk 3

#### Where in the value chain does the risk driver occur?

Downstream

#### Risk type & Primary climate-related risk driver

Market | Changing customer behavior

# Primary potential financial impact

Decreased revenues due to reduced demand for products and services

# Climate risk type mapped to traditional financial services industry risk classification <Not Applicable>

#### Company-specific description

QTS builds, owns and operates large scale colocation data centers that provide space for our customers to place their own computing equipment. We manage the power procurement, and the infrastructure equipment that cools our customers' servers. We see a very obvious trend of our customers insisting that we are able to meet their standards of energy efficiency and sustainability. We are required by some to disclose data and report to CDP. While some data centers would scoff at these requests, QTS has embraced the opportunity to improve. We are stewards of our environment, and we believe we can do good in the world through our actions toward reducing climate change.

#### Time horizon

Long-term

#### Likelihood

Virtually certain

#### Magnitude of impact

High

#### Are you able to provide a potential financial impact figure?



> Potential financial impact figure – minimum (currency) 800000

Potential financial impact figure – maximum (currency)

1000000

#### **Explanation of financial impact figure**

We can assume that without a robust climate change strategy we will lose at least one 10MW deal per year. A 10MW deal generates about \$15M per year in revenue, and we can assume a profit margin of 6.5%. \$15,000,000 x 6.5% = \$975,000

#### Cost of response to risk

#### Description of response and explanation of cost calculation

QTS does not view sustainable actions as an additional cost. They are part of doing business and being a good corporate citizen. The renewable energy that we purchase is typically below the cost of conventional energy, and energy efficient equipment has an acceptable payback. Every single suitable action that QTS takes is well thought out, responsible, and cost effective.

#### Comment

There are clearly salaries paid for those who focus on sustainability, and costs for new programs. but these are not incremental to our normal cost of doing business so we would not consider this to be a cost.

#### C2.4

(C2.4) Have you identified any climate-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes

# C2.4a

(C2.4a) Provide details of opportunities identified with the potential to have a substantive financial or strategic impact on your business.

#### Identifier

Opp1



# Opportunity type

Energy source

#### Primary climate-related opportunity driver

Use of lower-emission sources of energy

# Primary potential financial impact

Reduced indirect (operating) costs

#### Company-specific description

QTS has joined RE100 with a commitment to procure 100% of our energy from renewable sources by 2025. The strategy we use for procurement allows us to purchase energy at or below conventional power prices, which reduces our operational costs, and allows better access to customers who favor low carbon strategies. We estimate that more than 50% of our customers favor a low carbon strategy in general, and when coupled with lower cost of electricity with the same reliability, virtually all of our customers favor this approach. We have already implemented a carbon free strategy for our Fort Worth, Irving, Chicago, Piscataway, Hillsboro, and Netherlands sites, which account for 32% of our energy procurement.

#### Time horizon

Short-term

#### Likelihood

Virtually certain

#### Magnitude of impact

High

#### Are you able to provide a potential financial impact figure?

Yes, an estimated range

#### Potential financial impact figure (currency)

<Not Applicable>

#### Potential financial impact figure – minimum (currency)

6000000

#### Potential financial impact figure – maximum (currency)

7000000

#### Explanation of financial impact figure

QTS spends an estimated \$70M on energy each year. On average, we save about 10% on energy costs through our renewable procurement program. \$70,000,000 x 10% = \$7,000,000

#### Cost to realize opportunity

0



no incremental cost to implement.

#### Comment

This strategy is not yet available in all markets, however we believe that through policy involvement it will become more available in regulated markets over the next 10 years.

#### **Identifier**

Opp2

## Where in the value chain does the opportunity occur?

Downstream

# Opportunity type

Products and services

### Primary climate-related opportunity driver

Development of new products or services through R&D and innovation

#### Primary potential financial impact

Increased revenues resulting from increased demand for products and services

#### Company-specific description

QTS has developed a remarkable Service Delivery Platform that provides real-time energy use and efficiency data to each customer, customized to their environment. The data is used to help our customers reduce their energy consumption, and shift data processing loads as needed.

#### Time horizon

Medium-term

#### Likelihood

Likely

#### Magnitude of impact

Medium-high

### Are you able to provide a potential financial impact figure?

Yes, an estimated range

#### Potential financial impact figure (currency)

<Not Applicable>

#### Potential financial impact figure – minimum (currency)

#### Potential financial impact figure – maximum (currency)

20000000



> Our company does have this figure available, however, as this is proprietary information, we have chosen to keep this number confidential at this time

#### Cost to realize opportunity

500000

#### Strategy to realize opportunity and explanation of cost calculation

Our company does have this figure available, however, as this is proprietary information, we have chosen to keep this number confidential at this time

#### Comment

The Service delivery platform is revolutionary in our industry and requires that we keep trade secrets secret. What I can say is that it has been a very successful product launch.

#### **Identifier**

Opp3

#### Where in the value chain does the opportunity occur?

Direct operations

# Opportunity type

Resource efficiency

#### Primary climate-related opportunity driver

Reduced water usage and consumption

#### Primary potential financial impact

Reduced indirect (operating) costs

#### Company-specific description

QTS has developed a dry cooling solution that we refer to as Water FREEdom. It nearly eliminates the water consumed by our own operations, as well as the power plant operations that generates electricity for the site.

#### Time horizon

Short-term

#### Likelihood

Virtually certain

#### Magnitude of impact

Medium-low

#### Are you able to provide a potential financial impact figure?

Yes, an estimated range

#### Potential financial impact figure (currency)



3000000

Potential financial impact figure – maximum (currency)

4000000

#### **Explanation of financial impact figure**

QTS spends an average of \$2.87 on water for every MWH of electricity used. Assuming an average load of 140 MW:  $140 \times 24 \times 365 = 1,226,400 \text{ MWH } \times \$2.87 = \$3,519,768$ 

#### Cost to realize opportunity

20000000

# Strategy to realize opportunity and explanation of cost calculation

Replacing the entire portfolio's wet cooling systems with dry cooling systems would cost about \$100,000 per MW. Assuming there is 200MW of cooling systems that would need to be retrofitted, the cost would be about \$20,000,000

#### Comment

While this strategy does not make sense on a global scale, QTS has adopted the Water FREEdom platform for all new data centers moving forward.

# C3. Business Strategy

C3.1

(C3.1) Have climate-related risks and opportunities influenced your organization's strategy and/or financial planning?

Yes, and we have developed a low-carbon transition plan

C3.1a

(C3.1a) Does your organization use climate-related scenario analysis to inform its strategy? No, but we anticipate using qualitative and/or quantitative analysis in the next two years



# (C3.1c) Why does your organization not use climate-related scenario analysis to inform its strategy?

Our sustainability journey truly started in 2018, when a single employee was tapped to guide the company through a complex balancing act. In the short two years since we began, we have won 10 sustainability awards, we have been featured in magazines and have spoken at countless conferences on policy, technology, and processes that will help to support a low carbon economy. We have very quickly taken a leadership position in our industry. We have set very aggressive targets that cover the obvious, low hanging fruit, and clearly align with steps that need to be taken to support a low carbon economy. However using a scenario analysis to set goals and targets for the company is an immense task, and the limited internal resources did not allow for the deployment of a scenario based approach in the first 2 years of the program.

QTS Clearly understands the need to abide by science based targets that will strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius. As a supplier of Data Center services, QTS uses immense amounts of energy, most of which is still powered by fossil fuels. This is why our first step toward supporting the global threat of climate change was a very obvious choice of committing to procure 100% of our energy from renewable resources not by the target date of 2050, but by 2025. This was a big step, and it is not an easy goal by any means, but we are proud to be the 188th member of RE100, we are proud to very publicly present our data in GRI and SASB format in our stand alone ESG report, and we are proud to already be 32% of the way to our goal. We are proud of the work we have done so far, and we are confident that we have chosen a path that supports the necessary global response to climate change. But we also understand that to truly create value for our investors, they need to be assured that our path is well vetted in a way that is consistent with our peers.

This year, QTS has adopted a strategy that we refer to as Vision 2025. It outlines the foundation that will transform QTS into the industry's most innovative data center company, and aligns the entire organization around 8 key strategies. One of these strategies is Sustainability, where we outline the activities, Outputs, and KPI's that will be used to plan and evaluate progress, and evaluate risks associated with non-compliance. While this process is exceptionally well defined, it includes proprietary information and is not available for public disclosure.



> Development, People Services, Finance, Sales, Marketing, and Legal. We plan to begin the analysis in Q2 2021, and complete before the end of 2021.

# C3.1d

# (C3.1d) Describe where and how climate-related risks and opportunities have influenced your strategy.

	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Products and services	Yes	Prior to 2018 it was somewhat rare for our customers to even ask about renewable energy or sustainability efforts. Jump forward 2 years, and it has become table stakes for our largest customers. We will not even make it past the first round of an RFP if we cannot show a strong sustainability commitment. This customer preference has been a strong driver in our development of new products. In 2019 we launched a program we call Grow with QTS, where we have partnered with American Forests and committed to plant one tree per month for every 100kW of capacity that is contracted. Not only did we commit to this for new contracts, we went back in time and covered every active contract in our entire portfolio. The results have been amazing, and to date we have planted more than 20,000 trees in the Sierra Nevada mountains that have been ravaged by wildfires in recent years.
Supply chain and/or value chain	Yes	QTS spends 40% of its operating expense on energy procurement. The data center industry consumes 3% of the world's electricity, and contributes 2% of all greenhouse gasses. That is more than the airline industry. Since data centers are among the most energy intense facilities in the world, QTS decided in 2018 that we could have the most immediate impact on carbon emissions by reducing our own contribution by committing to 100% renewable energy - not by 2050, but by 2025. This is the most aggressive goal in our industry, and we are already 32% of the way to meeting it with 7 data centers running on 100% renewable power (Dallas, Fort Worth, Chicago, Piscataway NJ, Hillsboro OR, Eemshaven, and Groningen). And wile we believe the right first step is to get our own house in order, we firmly believe that we can amplify our impact by making it easier for others in our industry to do the same, and that is why we regularly speak openly at conferences about best practices, we do podcasts, we have authored whitepapers, and we have even won awards for our approach including the prestigious ranking of #1 in data Centers by GRESB. This year we have submitted an application for "Best Policy Influencer" to RE100.



	Have climate-related risks and opportunities influenced your strategy in this area?	Description of influence
Investment in R&D	Yes	There has always been a struggle in data centers about having efficient, large, centralized water based cooling plants, and less efficient refrigerant based systems that use no water. The main problem was that there was a huge investment in a centralized plant that turned out to be remarkably inefficient at low loads. As the business scaled with higher levels of absorption, the plant would work its way into the design efficiency. But sometimes that takes 5 years, and in the meantime, the inefficiency of the central plant made our Power Utilization Effectiveness (PUE) KPI look awful (1.8-2.2). In 2018 we built one of the most advanced and scalable water based cooling systems in the world in our Ashburn, VA facility. And while the overall cost was higher, the scalability allowed us to show near design-efficiency on day 1. Plus, it allowed us to stage the investment to match the business model. While this was a good start, we were now faced with the challenge of how to account for the intense water consumption. So we took the scalability lessons we learned and worked with our suppliers (Munters, Vertiv) to develop a solution that was scalable, water free, and as or more efficient than a water based system. The design we came up with accomplishes these things, and when we pair it with 100% wind or solar power, we refer to it as out Water FREEdom product. Not only are we among the most energy efficient data centers in the world with a PUE of 1.2-1.3, but we use no onsite water and no water used by the power plant that is supplying our energy. We refer to this as "scope 1" and "scope 2" water consumption.
Operations	Yes	40% of the cost to operate a data center is the cost of energy, and we are well aware that we operate in markets where carbon pricing systems are likely. Virginia just joined RGGI, and we already own 5 data centers in that state. Oregon has been extremely close to passing carbon pricing legislation for the last 2 years, and we have just opened a 270 MW data center campus in Hillsboro, OR. For these reasons, QTS decided to join RE100 and make the commitment to procure 100% of our energy from renewable sources by 2025. To date, we are already 32% of the way there.

# C3.1e

# (C3.1e) Describe where and how climate-related risks and opportunities have influenced your financial planning.

Financial	Description of influence
planning	
elements	
that have	
been	
influenced	



	Financial planning elements that have been influenced	Description of influence
Row 1	Access to capital	QTS is a publicly traded REIT, which means that our ability to grow is highly dependent on our ability to attract investors. In 2017 our Board of directors recognized that sustainability and managing our carbon footprint was very quickly becoming one of the most important topics to our shareholders, and if we wanted to continue to fund the business we would have to put together a very robust plan of action. Most companies would see this as a cost of doing business, but QTS leadership took the approach that it was much more than a necessary cost - it was an opportunity to invest in the company's future. The CEO decided to lead the effort, and he selected an executive to lead a team of 5 people to create what has become one of the most prominent and forward-leaning ESG teams in the industry. We set goals to be 100% renewable, install EV charging stations at 60% of our facilities, eliminate 600M lbs. of solid waste, Conserve 10M gallons of water each year, and pursue LEED certification in 90% of our facilities - all by 2025. One measure of success is our attraction of investors, and we have seen our stock price nearly double from \$38 to \$70 since this journey began 2 years ago. While this incredible rise cannot be directly attributable to the sustainability efforts, we do know for sure that some of the largest funds in the market now require transparency and disclosure in GRI and SASB formats, and the fact that we have a great story to tell has influenced the desire to own a piece of QTS.

# C3.1f

(C3.1f) Provide any additional information on how climate-related risks and opportunities have influenced your strategy and financial planning (optional).

# C4. Targets and performance

# C4.1

(C4.1) Did you have an emissions target that was active in the reporting year? Absolute target

# C4.1a



#### Target reference number

Abs 1

#### Year target was set

2018

#### Target coverage

Company-wide

#### Scope(s) (or Scope 3 category)

Scope 1+2 (market-based)

#### Base year

2017

# Covered emissions in base year (metric tons CO2e)

412753

# Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

100

# Target year

2025

# Targeted reduction from base year (%)

99.8

#### Covered emissions in target year (metric tons CO2e) [auto-calculated]

825.506000000012

#### Covered emissions in reporting year (metric tons CO2e)

391210

# % of target achieved [auto-calculated]

5.22980386446358

#### Target status in reporting year

Underway

#### Is this a science-based target?

Yes, we consider this a science-based target, but this target has not been approved as science-based by the Science-Based Targets initiative

#### Please explain (including target coverage)

QTS has a goal to procure 100% of its energy from renewable (Scope 2 carbon free) sources by 2025. We have a small amount Scope 1 of emissions from testing diesel generators, and eventually we believe we can shift these units to biodiesel, but the goal has not yet been



> appears slow, keep in mind that this is an absolute target and the measure of a data center's growth is by how much power it uses. Without increased power usage, the company would not be growing. So as the non-renewable sites grow, the denominator in our equation makes the % achievement appear low. So while overall electricity consumption grew by 10%, emissions dropped by 5.2%.

# Target reference number

Abs 2

Year target was set

2018

#### Target coverage

Company-wide

#### Scope(s) (or Scope 3 category)

Scope 3: End-of-life treatment of sold products

#### Base year

2017

Covered emissions in base year (metric tons CO2e)

505538

Covered emissions in base year as % of total base year emissions in selected Scope(s) (or Scope 3 category)

98

#### Target year

2050

Targeted reduction from base year (%)

98

Covered emissions in target year (metric tons CO2e) [auto-calculated]

10110.76

Covered emissions in reporting year (metric tons CO2e)

286917

% of target achieved [auto-calculated]

44.1277714160408

Target status in reporting year

Underway

Is this a science-based target?



#### Please explain (including target coverage)

QTS develops, owns and operated massive data centers around the world. The typical process for any data center company when developing these massive, expensive, critical operation facilities is to start from zero, and build everything new. And QTS does this with many of our development projects. But four of them - Atlanta, Dallas, Chicago, and Richmond, VA were massive structures that were originally built for something else. Atlanta was a huge Sears and Roebuck distribution center. Dallas and Richmond were old semiconductor plants, and Chicago was the Chicago sun times printing facility. As the times changed, these structures were no longer useful for their intended purpose. Most data center companies would choose to scrape that building off the ground and start fresh. But QTS took the step of refreshing these structures and turning them into some of the most advanced and energy efficient buildings in the world. So far we have saved 628,000 MWH of electricity in those four markets from not having to reproduce the steel and concrete. And we have saves 538,000 gallons of diesel fuel from being burned from hauling that material to the landfill. By 2050 these facilities will be 100% full and we will have saved all of the steel and concrete that would have had to be reproduced.

# C4.2

(C4.2) Did you have any other climate-related targets that were active in the reporting year? Target(s) to increase low-carbon energy consumption or production

# C4.2a

(C4.2a) Provide details of your target(s) to increase low-carbon energy consumption or production.

Target reference number

Low 1

Year target was set

2018

Target coverage

Company-wide

Target type: absolute or intensity

Absolute



Target type: activity

Consumption

Target type: energy source

Renewable energy source(s) only

Metric (target numerator if reporting an intensity target)

Percentage

Target denominator (intensity targets only)

<Not Applicable>

Base year

2017

Figure or percentage in base year

Target year

2025

Figure or percentage in target year

100

Figure or percentage in reporting year

29

% of target achieved [auto-calculated]

29

Target status in reporting year

Underway

Is this target part of an emissions target?

This is the primary driver for C4.1a

Is this target part of an overarching initiative?

RE100

Please explain (including target coverage)

This is a financial year target. We reported a renewable energy consumption target in C4.2 last year and are reporting progress against the same target this year.

C4.3



Yes

#### C4.3a

(C4.3a) Identify the total number of initiatives at each stage of development, and for those in the implementation stages, the estimated CO2e savings.

	Number of initiatives	Total estimated annual CO2e savings in metric tonnes CO2e (only for rows marked *)
Under investigation	1	825
To be implemented*	0	0
Implementation commenced*	2	411948
Implemented*	2	584
Not to be implemented	0	0

# C4.3b

(C4.3b) Provide details on the initiatives implemented in the reporting year in the table below.

#### Initiative category & Initiative type

Company policy or behavioral change | Customer engagement

Estimated annual CO2e savings (metric tonnes CO2e)

564

Scope(s)

Scope 3

**Voluntary/Mandatory** 

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

25200

Investment required (unit currency – as specified in C0.4)

22400

Payback period



>30 years

#### Comment

QTS has initiated a program whereby we will plant one tree per month for every 100kW of contract that a customer signs with us. We have proprietary formulas to count the expected lease-up increase that equates to a less-than one year payback.

### **Initiative category & Initiative type**

Transportation | Employee commuting

# Estimated annual CO2e savings (metric tonnes CO2e)

20

#### Scope(s)

Scope 3

#### Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

576

Investment required (unit currency – as specified in C0.4)

85000

#### Payback period

>25 years

#### Estimated lifetime of the initiative

21-30 years

#### Comment

QTS made the bold decision to not only install EV charging stations at each of our mega data centers, we offer the first 3 hours of charging for free, and then charge the low price of power that we pay for any remaining time. We offer this to not only our employees, but our customers and contractors who enter our properties. While the payback is not great the way we set this up, it certainly could be if we were to charge more for the electricity. The point is simply goodwill toward our stakeholders, and goodwill to our planet. We are proud to have installed EV charging at 11 of our 18 sites, with a goal to increase to 90% of all sites by 2025. So far, this initiative has saved almost 12,000 kg of CO2 emissions, and we are now pairing our EV charging stations with sites that procure 100% renewable power. Our Hillsboro site is next on the list, followed by Santa Clara and Sacramento.

#### Initiative category & Initiative type

Low-carbon energy consumption | Wind



#### Scope(s)

Scope 2 (market-based)

#### Voluntary/Mandatory

Voluntary

Annual monetary savings (unit currency – as specified in C0.4)

6520000

Investment required (unit currency – as specified in C0.4)

200000

#### Payback period

<1 year

#### Estimated lifetime of the initiative

Ongoing

#### Comment

QTS has developed a unique renewable energy procurement model that allows us to procure long term, fixed price renewable energy for a cost that is approximately 10% lower than the cost of conventional energy. Our model is somewhat complex, which is why we have a specific person to manage this process, but ultimately the payback is enormous. today, 32% or our energy is procured this way, and we expect 100% to be procured this way by 2025. The process requires a combination of private developers, tax equity investors, private lenders, commodity hedge entities, retail electric suppliers, and QTS. We get all of these folks to partner in a way that is beneficial for all of us, and the end result is a big savings of cost while we help get new renewable energy projects funded and operational.

# C4.3c

# (C4.3c) What methods do you use to drive investment in emissions reduction activities?

Method	Comment
Dedicated	QTS has a dedicated budget for development of its data centers that includes energy efficient design,
budget for	LEED certifications, and Energy Star ratings. We carefully choose our suppliers and equipment to most
energy efficiency	cost effectively balance first cost with operational performance.



> (C4.5) Do you classify any of your existing goods and/or services as low-carbon products or do they enable a third party to avoid GHG emissions?

Yes

# C4.5a

(C4.5a) Provide details of your products and/or services that you classify as low-carbon products or that enable a third party to avoid GHG emissions.

# Level of aggregation

Company-wide

# **Description of product/Group of products**

QTS offers data center services in 17 different markets. Some of these markets offer data centers that procure their energy from renewable sources. Today, we offer this product in 7 of our data centers (Hillsboro, Fort Worth, Irving, Chicago, Piscataway, Eemshaven, and Groningen). We display the carbon savings by customer on our service delivery platform portal, and we provide attestations of compliance for carbon offsets.

# Are these low-carbon product(s) or do they enable avoided emissions?

Low-carbon product and avoided emissions

# Taxonomy, project or methodology used to classify product(s) as low-carbon or to calculate avoided emissions

Other, please specify (The energy that we use to power the customer's space is a pure passthrough to the customer. We are in control of the purchase, and they are in control of the usage. So accounting for a low carbon product is procuring low carbon energy.)

# % revenue from low carbon product(s) in the reporting year 30

#### % of total portfolio value

<Not Applicable>

#### Asset classes/ product types

<Not Applicable>

#### Comment

In the data center industry we support some of the most well known tech companies in the world. Many of these companies have internal sustainability goals, and they consider QTS a Scope 3 emission source for them. When we can provide the customer with 100% renewable power, they can claim their Scope 3 emissions from QTS to be zero.



# C5. Emissions methodology

# C5.1

# (C5.1) Provide your base year and base year emissions (Scopes 1 and 2).

#### Scope 1

# Base year start

January 1 2017

#### Base year end

December 31 2017

#### Base year emissions (metric tons CO2e)

825

#### Comment

Diesel Fuel emissions from running backup generators, primarily for testing.

#### Scope 2 (location-based)

#### Base year start

**January 1 2017** 

#### Base year end

**December 31 2017** 

#### Base year emissions (metric tons CO2e)

412757

#### Comment

Based on eGRID data, 2016 version.

#### Scope 2 (market-based)

#### Base year start

January 1 2017

# Base year end

December 31 2017

### Base year emissions (metric tons CO2e)



# C5.2

(C5.2) Select the name of the standard, protocol, or methodology you have used to collect activity data and calculate emissions.

US EPA Center for Corporate Climate Leadership: Indirect Emissions From Purchased Electricity

US EPA Center for Corporate Climate Leadership: Direct Emissions from Stationary Combustion Sources

US EPA Emissions & Generation Resource Integrated Database (eGRID)

#### C6. Fmissions data

#### C6.1

(C6.1) What were your organization's gross global Scope 1 emissions in metric tons CO2e?

# Reporting year

Gross global Scope 1 emissions (metric tons CO2e)

1548.5

Start date

<Not Applicable>

End date

<Not Applicable>

Comment

Diesel Fuel burn from Back Up Generators, as well as Natural Gas consumption

#### C6.2

(C6.2) Describe your organization's approach to reporting Scope 2 emissions.



We are reporting a Scope 2, location-based figure

## Scope 2, market-based

We are reporting a Scope 2, market-based figure

#### Comment

We use eGRID to calculate our Scope 2 emissions

# C6.3

(C6.3) What were your organization's gross global Scope 2 emissions in metric tons CO2e?

## Reporting year

Scope 2, location-based

391210

Scope 2, market-based (if applicable)

0

### Start date

<Not Applicable>

### End date

<Not Applicable>

#### Comment

We use eGRID to calculate our Scope 2 emissions

## C6.4

(C6.4) Are there any sources (e.g. facilities, specific GHGs, activities, geographies, etc.) of Scope 1 and Scope 2 emissions that are within your selected reporting boundary which are not included in your disclosure?

No

## C6.5



### Purchased goods and services

#### **Evaluation status**

Relevant, calculated

#### Metric tonnes CO2e

30434

## **Emissions calculation methodology**

QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool. This tool used the \$ spent on categories to translate them into estimated scope 3 emissions. This category includes software, licenses, communications, contract labor, training and development, Repair and Maintenance, and miscellaneous expenses.

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

#### Please explain

This year QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool for the first time, and while the data from our operations has been entered, the results appear to be logically correct.

## Capital goods

#### **Evaluation status**

Relevant, calculated

#### Metric tonnes CO2e

264679

## **Emissions calculation methodology**

QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool. This tool used the \$ spent on categories to translate them into estimated scope 3 emissions. This category includes all of the following: Earthwork / Grading Site Improvements Off Site Improvements Utilities Power Ductbanks Fiber Ductbanks Core & Shell Future Fit Out BMS/EPMS Interior Telecom Security Fire Protection Plumbing Mechanical Electrical Weather, Add. Acceleration, Modifications Fit Out Interiors Equipment FF&E, A/V Structural Ceiling & Light fixtures Network, Security, DCIM, Corp IT BMS/EPMS Design & CA Services Permits Bonds Commissioning Other RPPs Weather, Other - QTS unknowns Contingency Fiber Substation -Dominion Power/Temp Power

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

## Please explain



### Fuel-and-energy-related activities (not included in Scope 1 or 2)

#### **Evaluation status**

Relevant, calculated

#### Metric tonnes CO2e

78451

## **Emissions calculation methodology**

QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool. This tool used the \$ spent on categories to translate them into estimated scope 3 emissions. This category is estimated by the tool based on our known scope 1 and 2 emissions.

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

This year QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool for the first time, and while the data from our operations has been entered, the results appear to be logically correct.

## Upstream transportation and distribution

#### **Evaluation status**

Relevant, calculated

#### Metric tonnes CO2e

272.6

### **Emissions calculation methodology**

QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool. This tool used the \$ spent on categories to translate them into estimated scope 3 emissions. This category includes all of the following: Equip freight, rigging/storage

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

This year QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool for the first time, and while the data from our operations has been entered, the results appear to be logically correct.

### Waste generated in operations

#### **Evaluation status**

Relevant calculated



### **Emissions calculation methodology**

QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool. This tool used the \$ spent on categories to translate them into estimated scope 3 emissions. This category includes all of the following: Waste management and remediation services

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

This year QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool for the first time, and while the data from our operations has been entered, the results appear to be logically correct.

### **Business travel**

#### **Evaluation status**

Relevant, calculated

#### Metric tonnes CO2e

6309

## **Emissions calculation methodology**

QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool. This tool used the \$ spent on categories to translate them into estimated scope 3 emissions. This category includes all of the following: Hotel, Air and Car travel related expenses

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

### Please explain

This year QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool for the first time, and while the data from our operations has been entered, the results appear to be logically correct.

#### Employee commuting

#### **Evaluation status**

Relevant, calculated

## **Metric tonnes CO2e**

1020

#### **Emissions calculation methodology**

QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool. This tool used the \$ spent on categories to translate them into estimated scope 3 emissions. This category



0

### Please explain

This year QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool for the first time, and while the data from our operations has been entered, the results appear to be logically correct.

#### Upstream leased assets

#### **Evaluation status**

Relevant, calculated

#### Metric tonnes CO2e

375

## **Emissions calculation methodology**

QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool. This tool used the \$ spent on categories to translate them into estimated scope 3 emissions. This category includes an estimate based on a leased office space that is 33,000 sf.

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

0

## Please explain

This year QTS used the Quantis GHG Protocol Scope 3 emissions evaluation tool for the first time, and while the data from our operations has been entered, the results appear to be logically correct.

### Downstream transportation and distribution

#### **Evaluation status**

Not relevant, explanation provided

#### Metric tonnes CO2e

<Not Applicable>

### **Emissions calculation methodology**

<Not Applicable>

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

#### Please explain

QTS provides services only - there are no physical products produced by QTS. All of the emissions related to the services that we provide have been included in our Scope 1 and Scope 2 emission reporting



#### **Evaluation status**

Not relevant, explanation provided

#### Metric tonnes CO2e

<Not Applicable>

### **Emissions calculation methodology**

<Not Applicable>

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

## Please explain

QTS provides services only - there are no physical products produced by QTS. All of the emissions related to the services that we provide have been included in our Scope 1 and Scope 2 emission reporting.

### Use of sold products

#### **Evaluation status**

Not relevant, explanation provided

#### Metric tonnes CO2e

<Not Applicable>

### **Emissions calculation methodology**

<Not Applicable>

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

#### Please explain

QTS provides services only - there are no physical products produced by QTS. All of the emissions related to the services that we provide have been included in our Scope 1 and Scope 2 emission reporting. Our customers report the emissions generated by data center operations as Scope 3, and QTS reports them as Scope 2.

### End of life treatment of sold products

#### **Evaluation status**

Not relevant, explanation provided

#### Metric tonnes CO2e

<Not Applicable>

## **Emissions calculation methodology**



# Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

## Please explain

QTS provides services only - there are no physical products produced by QTS. All of the emissions related to the services that we provide have been included in our Scope 1 and Scope 2 emission reporting. The products we sell are instantly used, so there is no end of life evaluation necessary.

#### Downstream leased assets

#### **Evaluation status**

Not relevant, explanation provided

#### Metric tonnes CO2e

<Not Applicable>

## **Emissions calculation methodology**

<Not Applicable>

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

### Please explain

All leased facility emissions have been included in our Scope 1 and Scope 2 emissions, and we did not use equity share to evaluate emissions.

### Franchises

#### **Evaluation status**

Not relevant, explanation provided

#### Metric tonnes CO2e

<Not Applicable>

## **Emissions calculation methodology**

<Not Applicable>

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

### Please explain

QTS is not a franchisee or franchisor, and as such this topic is not relevant.

#### **Investments**



#### Metric tonnes CO2e

<Not Applicable>

# **Emissions calculation methodology**

<Not Applicable>

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

### Please explain

QTS does not hold investments or is not part of a joint venture that has not disclosed emissions. All investment and joint venture emissions have been included in our Scope 1 and Scope 2 emissions, and we did not use equity share to evaluate emissions.

## Other (upstream)

#### **Evaluation status**

Not relevant, explanation provided

#### Metric tonnes CO2e

<Not Applicable>

## **Emissions calculation methodology**

<Not Applicable>

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>

## Please explain

There are no other relevant upstream emissions to capture.

### Other (downstream)

#### **Evaluation status**

Not relevant, explanation provided

#### Metric tonnes CO2e

<Not Applicable>

### **Emissions calculation methodology**

<Not Applicable>

# Percentage of emissions calculated using data obtained from suppliers or value chain partners

<Not Applicable>



C6.7

(C6.7) Are carbon dioxide emissions from biogenic carbon relevant to your organization? No

## C6.10

(C6.10) Describe your gross global combined Scope 1 and 2 emissions for the reporting year in metric tons CO2e per unit currency total revenue and provide any additional intensity metrics that are appropriate to your business operations.

## Intensity figure

820

Metric numerator (Gross global combined Scope 1 and 2 emissions, metric tons CO2e) 392758

## Metric denominator

unit total revenue

#### Metric denominator. Unit total

479

### Scope 2 figure used

Location-based

## % change from previous year

11.5

### Direction of change

Decreased

# Reason for change

In 2018 we had \$450 Million in Revenue, and 411,480 Metric tons of scope 1 and scope 2 emissions. In 2019 we have \$479 Million in Revenue and 392,758 MT of scope 1 and scope 2 emissions. There were three primary reasons for this reduction - Natural Gas consumption reduced by 59% due to efficiency projects as well as more favorable weather conditions. Diesel fuel Emissions dropped by 6% due to standardization of maintenance activities on our backup generators. Renewable energy procurement increased from one site in 2018 to 5 sites in 2019.



# C7. Emissions breakdowns

# C7.1

(C7.1) Does your organization break down its Scope 1 emissions by greenhouse gas type? Yes

# C7.1a

# (C7.1a) Break down your total gross global Scope 1 emissions by greenhouse gas type and provide the source of each used greenhouse warming potential (GWP).

Greenhouse gas	Scope 1 emissions (metric tons of CO2e)	GWP Reference
CO2	1544	IPCC Fourth Assessment Report (AR4 - 100 year)
CH4	1.5	IPCC Fourth Assessment Report (AR4 - 100 year)
N20	3.16	IPCC Fourth Assessment Report (AR4 - 100 year)
HFCs	0	IPCC Fourth Assessment Report (AR4 - 100 year)
PFCs	0	IPCC Fourth Assessment Report (AR4 - 100 year)
SF6	0	IPCC Fourth Assessment Report (AR4 - 100 year)
NF3	0	IPCC Fourth Assessment Report (AR4 - 100 year)

# C7.2

# (C7.2) Break down your total gross global Scope 1 emissions by country/region.

Country/Region	Scope 1 emissions (metric tons CO2e)
United States of America	1548.5



## By business division

# C7.3a

# (C7.3a) Break down your total gross global Scope 1 emissions by business division.

Business division	Scope 1 emissions (metric ton CO2e)
Data Center Operations	1548.5

# C7.5

# (C7.5) Break down your total gross global Scope 2 emissions by country/region.

Country/Region	Scope 2, location- based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)	consumed electricity,	Purchased and consumed low-carbon electricity, heat, steam or cooling accounted for in Scope 2 market-based approach (MWh)
United States of America	391210	0	1166055	304397
Netherlands	0	0	13075	20000

# C7.6

# (C7.6) Indicate which gross global Scope 2 emissions breakdowns you are able to provide. By business division

# C7.6a

# (C7.6a) Break down your total gross global Scope 2 emissions by business division.

Business division	Scope 2, location-based (metric tons CO2e)	Scope 2, market-based (metric tons CO2e)



# C7.9

(C7.9) How do your gross global emissions (Scope 1 and 2 combined) for the reporting year compare to those of the previous reporting year?

Decreased

# C7.9a

(C7.9a) Identify the reasons for any change in your gross global emissions (Scope 1 and 2 combined), and for each of them specify how your emissions compare to the previous year.

	Change in emissions (metric tons	Direction of change	Emissions value (percentage)	Please explain calculation
	CO2e)			
Change in renewable energy consumption	137907	Decreased	33.6	QTS has committed to procuring 100% of our energy from renewable sources by 2025. In 2019, we added Chicago and Piscataway to sites that are using 100% renewable energy. In 2018 we had a total of 410,936 Scope 1+2 emissions. 137,907/410,936 = 33.6%
Other emissions reduction activities	76	Decreased	0.02	QTS standardized the operating procedures for maintenance related diesel generator runs, and as such, we reduced our diesel fuel consumption by 7,457 gallons. In 2018 we had a total of 410,936 Scope 1+2 emissions. 76/410,936 = .02%
Divestment	0	No change	0	QTS Did not divest any assets
Acquisitions	0	No change	0	QTS did not acquire emissions related assets
Mergers	0	No change	0	QTS did not have any mergers
Change in output	45714	Increased	11.1	Output in operations increased. We measure our output by the MWH consumed. In this case, we increased output from 1,069,923 to 1,166,055 MWH, which resulted in increased emissions of 45,714 MT CO2e. In 2018 we had a total of 410,936 Scope 1+2 emissions. 45,714/410,936 = 11.1%
Change in methodology	0	No change	0	There was no change in methodology
Change in boundary	0	No change	0	There was no change in Boundary
Change in physical operating	0	No change	0	There was no material change in operating conditions



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Other	0	No change	0	There are no other emissions related changes to report
	Change in emissions (metric tons CO2e)	Direction of change	Emissions value (percentage)	Please explain calculation

# C7.9b

(C7.9b) Are your emissions performance calculations in C7.9 and C7.9a based on a locationbased Scope 2 emissions figure or a market-based Scope 2 emissions figure? Location-based

# C8. Energy

# C8.1

(C8.1) What percentage of your total operational spend in the reporting year was on energy? More than 40% but less than or equal to 45%

# C8.2

# (C8.2) Select which energy-related activities your organization has undertaken.

	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of fuel (excluding feedstocks)	Yes
Consumption of purchased or acquired electricity	Yes
Consumption of purchased or acquired heat	No



	Indicate whether your organization undertook this energy-related activity in the reporting year
Consumption of purchased or acquired cooling	No
Generation of electricity, heat, steam, or cooling	No

# C8.2a

# (C8.2a) Report your organization's energy consumption totals (excluding feedstocks) in MWh.

	Heating value	MWh from renewable sources	MWh from non- renewable sources	Total (renewable and non-renewable) MWh
Consumption of fuel (excluding feedstock)	HHV (higher heating value)	0	6564	6564
Consumption of purchased or acquired electricity	<not Applicable&gt;</not 	324397	874733	1199130
Consumption of purchased or acquired heat	<not Applicable&gt;</not 	<not applicable=""></not>	<not applicable=""></not>	<not applicable=""></not>
Consumption of purchased or acquired steam	<not Applicable&gt;</not 	<not applicable=""></not>	<not applicable=""></not>	<not applicable=""></not>
Consumption of purchased or acquired cooling	<not Applicable&gt;</not 	<not applicable=""></not>	<not applicable=""></not>	<not applicable=""></not>
Consumption of self-generated non-fuel renewable energy	<not Applicable&gt;</not 	<not applicable=""></not>	<not applicable=""></not>	<not applicable=""></not>
Total energy consumption	<not Applicable&gt;</not 	324397	881297	1205694

# C8.2b

# (C8.2b) Select the applications of your organization's consumption of fuel.

	Indicate whether your organization undertakes this fuel application
Consumption of fuel for the generation of electricity	Yes
Consumption of fuel for the generation of heat	Yes
Consumption of fuel for the generation of steam	No



## C8.2c

(C8.2c) State how much fuel in MWh your organization has consumed (excluding feedstocks) by fuel type.

### Fuels (excluding feedstocks)

Fuel Oil Number 1

### Heating value

HHV (higher heating value)

# Total fuel MWh consumed by the organization

5148

## MWh fuel consumed for self-generation of electricity

5148

## MWh fuel consumed for self-generation of heat

O

## MWh fuel consumed for self-generation of steam

<Not Applicable>

# MWh fuel consumed for self-generation of cooling

<Not Applicable>

### MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

### **Emission factor**

10.18

#### Unit

kg CO2 per gallon

## **Emissions factor source**

Source: Intergovernmental Panel on Climate Change (IPCC), Fourth Assessment

#### Comment

QTS uses backup generators to ensure reliability. It is extremely rare that the generators are actually running to provide electricity for operations. Rather, most of the fuel consumed is for bi-weekly maintenance runs, and does not generate usable electricity. However, this is the closest category to fit this emission source, and in the event of a utility outage, the generators would provide power to the operations.



### Heating value

HHV (higher heating value)

# Total fuel MWh consumed by the organization

1416

MWh fuel consumed for self-generation of electricity

MWh fuel consumed for self-generation of heat

1416

MWh fuel consumed for self-generation of steam

<Not Applicable>

MWh fuel consumed for self-generation of cooling

<Not Applicable>

MWh fuel consumed for self-cogeneration or self-trigeneration

<Not Applicable>

#### **Emission factor**

53 06

#### Unit

kg CO2 per million Btu

### **Emissions factor source**

Source: Intergovernmental Panel on Climate Change (IPCC), Fourth Assessment

### Comment

Natural gas is used for generation of heat in our colder climate areas. All fuel is consumed in Virginia, California, Georgia, New Jersey, and Chicago.

## C8.2e

(C8.2e) Provide details on the electricity, heat, steam, and/or cooling amounts that were accounted for at a zero emission factor in the market-based Scope 2 figure reported in C6.3.

### Sourcing method

Power purchase agreement (PPA) with a grid-connected generator with energy attribute certificates

### Low-carbon technology type



United States of America

MWh consumed accounted for at a zero emission factor 304397

### Comment

In 2019 we procured renewable energy for three of our sites. Dallas, Chicago, and Piscataway, NJ. Chicago accounted for 42,780MWH, Dallas was 202,865, and Piscataway was 58,752.

## Sourcing method

Unbundled energy attribute certificates, Guarantees of Origin

# Low-carbon technology type

Hydropower

Country/region of consumption of low-carbon electricity, heat, steam or cooling Norway

MWh consumed accounted for at a zero emission factor 20000

#### Comment

Our Dutch operations are offset by Nordic Hydro GO's. Last year we procured 20,000 GO's.

## C9. Additional metrics

C9.1

(C9.1) Provide any additional climate-related metrics relevant to your business.

# C10. Verification

# C10.1



	Verification/assurance status
Scope 1	No third-party verification or assurance
Scope 2 (location-based or market-based)	No third-party verification or assurance
Scope 3	No third-party verification or assurance

## C10.2

(C10.2) Do you verify any climate-related information reported in your CDP disclosure other than the emissions figures reported in C6.1, C6.3, and C6.5?

No, but we are actively considering verifying within the next two years

# C11. Carbon pricing

# C11.1

(C11.1) Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)?

No, and we do not anticipate being regulated in the next three years

## C11.2

(C11.2) Has your organization originated or purchased any project-based carbon credits within the reporting period?

No

## C11.3

(C11.3) Does your organization use an internal price on carbon?

No but we enticinate doing on in the next two years



# C12. Engagement

## C12.1

## (C12.1) Do you engage with your value chain on climate-related issues?

Yes, our suppliers

Yes, our customers

## C12.1a

### (C12.1a) Provide details of your climate-related supplier engagement strategy.

### Type of engagement

Innovation & collaboration (changing markets)

## Details of engagement

Run a campaign to encourage innovation to reduce climate impacts on products and services

## % of suppliers by number

100

### % total procurement spend (direct and indirect)

100

### % of supplier-related Scope 3 emissions as reported in C6.5

100

### Rationale for the coverage of your engagement

QTS uses the Greenhouse Gas Protocol's Quantis tool to estimate our Scope 3 emissions, and as QTS is a relatively small company with a small number of suppliers compared to many others who report to CDP, covering all of our purchases is not a heavy lift. QTS also uses a very sophisticated and integrated ERP software system (Workday) that makes report generation and expense categorizing easy.

#### Impact of engagement, including measures of success

While it is difficult to estimate the scope 3 emissions reduction potential, we do know that we have become more energy efficient through engagement with our suppliers, which is the measure of success we have chosen to use. We measure this on a closely monitored



> 2019, and a 2.9% improvement from the baseline year of 2017. We expect to use over 6,000,000 MWH of energy over the next 5 years, and a 2.9% energy efficiency improvement will save 174,000 MWH over the 5 year period, and an estimated 78,000 metric tons of CO2e. In 2019 QTS began construction of our Hillsboro data center. Part of this process was to reengineer the cooling systems to be both water free and energy efficient. We narrowed our supplier options down to two, and challenged each of them to show us how their systems could outperform our expectations. The result was an amazing partnership with Liebert using their DSE system with automated economization This system will provide us with a 16% energy reduction in the cooling system, which will save 7,568 MWH on the first building alone. 30MW IT x 18% cooling x 16% = 0.864 MW x 24 x 365 = 7,568 MWH per year. We intend to continue this design for the remaining 4 buildings on the campus. This first building will save an estimated 2,250 MT of CO2e emissions every year through reduced electricity consumption.

#### Comment

QTS is committed to addressing sustainable procurement by adopting the key elements of sustainability, namely, environmental quality, social justice, and economic prosperity. We recognize that the products and services we procure have both environmental and social impacts and we are committed to addressing these through our procurement procedures. Our policy for sustainable procurement will be to acquire products and services that meet our needs, deliver long term value, maximize social and economic benefits, and minimize damage to the environment and health. In order to ensure effective implementation of our policy and giving due consideration to market and economic availability, our objectives are to: • Procure from ethical and legal sources. • Purchase energy from renewable resources. • Include sustainability criteria when appointing the services of Sub-contractors. • Influence Clients and Designers when specifying materials to encourage the specification of materials with a recycled content, or materials that can be easily recycled at the end. • Procure energy efficient equipment that is UL or CE listed and meets or exceeds common energy efficiency standards. • Encourage the reuse of materials as a first priority in preference to the purchase of new materials. • Require that all members of the supply chain comply with relevant legal requirements according to industry quidelines and standards, and be able to demonstrate compliance. • Request details from Sub-contractors regarding environmental policies, management systems, environmental breaches, and assess this information as part of our Company approval process. • Use local suppliers and Sub-contractors where appropriate to minimize the environmental impact associated with transportation and to support the local economy. • Aim to avoid the use of materials and substances with hazardous properties, and processes that could cause damage to the environment and health. • Collaborate on sustainable procurement opportunities throughout the supply chain and through membership of trade associations, sharing best practice. • Promote awareness of this policy amongst Employees and supply chain.



(C12.1b) Give details of your climate-related engagement strategy with your customers.

## Type of engagement

Collaboration & innovation

## Details of engagement

Run a campaign to encourage innovation to reduce climate change impacts

% of customers by number

25

% of customer - related Scope 3 emissions as reported in C6.5

## Portfolio coverage (total or outstanding)

<Not Applicable>

QTS procures carbon free energy in our Irving, Chicago, and Piscataway facilities. These three facilities comprise approximately 25% of the customers within the company's portfolio, and 26% of the product that we sell. We have partnered with many of these customers by providing attestations of compliance for the energy they use at our facilities, which in turn allows them to claim the energy as scope 3 emissions rather than scope 2. We then provide

Please explain the rationale for selecting this group of customers and scope of engagement

real time data about energy use in their own environment on a real time basis within our service delivery platform portal. We provide free blanking panels to improve airflow efficiency, and we provide free energy assessments for our customers.

## Impact of engagement, including measures of success

Using the blanking panel program as an example case, we know that each 1U blanking panel saves 0.003308824 KW of electricity, and we have distributed 185,780 blanking panels. This equates to 5,384,888 KWH/year, and an estimated CO2 savings of 2,423 metric tons per year. Blanking panels installed 185,780 Energy saved per 12" 1.50% U per 12" 6.8 U Racks that will save 1.5% 27320.58824 Racks Rack KW 3 KW PUE 1.5 Power required to cool 1.5 KW Cooling power saved per rack 0.0225 KW Total power saved 614.7132353 kW Total Energy saved per year 5,384,888 KWH Cost of Energy 0.06 \$/kWH Savings \$323,093.28 Per Year Each 1U blanking panel saves 0.003308824 KW

C12.3

(C12.3) Do you engage in activities that could either directly or indirectly influence public policy on climate-related issues through any of the following?

Direct engagement with policy makers

Trade acconiations



## C12.3a

# (C12.3a) On what issues have you been engaging directly with policy makers?

Focus of legislation		Details of engagement	Proposed legislative solution
Clean energy generation	Support	QTS testified against Dominion Energy in Virginia on a tariff that would have limited the ability for smaller customers to procure renewable energy from third parties. We are platinum members of REBA, where we sit on the policy committee, and we are active members of the energy committee of the Data Center Coalition.	Dominion wanted to require any customer under 5MW to procure renewable energy only through them, while we wanted smaller customers to be able to aggregate their loads to hit the 5MW threshold to procure energy from 3rd parties, as long as they were procuring renewable energy.

## C12.3b

(C12.3b) Are you on the board of any trade associations or do you provide funding beyond membership?

No

## C12.3f

(C12.3f) What processes do you have in place to ensure that all of your direct and indirect activities that influence policy are consistent with your overall climate change strategy?

Policy arguments are generally initiated by either REBA or the Data Center Coalition, where we sit on the policy and energy committees. Our membership pre-screens these opportunities, and when we believe an issue is relevant to our operations, or our corporate goals, we will approach the CEO and Board chairman for approval to proceed. We will bring in executive team members from Finance, Investor Relations, People Services, Operations, and Legal for a final approval, and we will check in with a status report monthly. The first order rules are that they must be relevant to our operations, and they must fit within our corporate goals.

### C124



> (C12.4) Have you published information about your organization's response to climate change and GHG emissions performance for this reporting year in places other than in your CDP response? If so, please attach the publication(s).

### **Publication**

In voluntary sustainability report

#### **Status**

Complete

#### Attach the document

QTS\_ESG Report\_2019.pdf

# Page/Section reference

The entire publication talks about Governance, Strategy, Risks and Opportunities, Emissions figures, Emissions Targets, and other metrics. We use the GRI format, of which a table can be found starting on page 58.

#### Content elements

Governance

Strategy

Risks & opportunities

**Emissions figures** 

**Emission targets** 

Other metrics

#### Comment

This report can also be found at: https://www.qtsdatacenters.com/resources/brochures/esqinitiatives-2019

### Publication

In mainstream reports

#### **Status**

Complete

#### Attach the document

QTS (QTS Realty Trust Inc. Class A) (10-K) 2020-02-28.pdf\_.pdf

## Page/Section reference

Page 9 - Commitment to Environmental Sustainability.

#### Content elements

Strategy

Risks & opportunities

**Emission targets** 



#### **Publication**

In voluntary communications

### **Status**

Complete

## Attach the document

QTS\_2019\_SASB Index.pdf

## Page/Section reference

All three pages

### **Content elements**

**Emissions figures** 

**Emission targets** 

#### Comment

This is our SASB compliant ESG Index

# C15. Signoff

## C-FI

(C-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

# C15.1

(C15.1) Provide details for the person that has signed off (approved) your CDP climate change response.

	Job title	Corresponding job category
Row 1	Chief Operating Officer	Chief Operating Officer (COO)

