# FINDING EVIDENCE OF GREEN LEASING IN UNITED STATES GOVERNMENT-LEASED PROPERTIES

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## ABSTRACT

Although the term "green leasing" is not yet well defined, its primary purpose is clear. With an aim to create a collaborative environment through legal provisions between a building owner and a tenant, green leasing may ultimately help resolve the energy paradox in tenanted properties. Issues surrounding split-incentives are driven by a mismatch between owners' capital expenditures on improving building energy efficiency and an uncertainty of tenant or occupant behavior that might affect a building's energy consumption. Though some countries have started to develop guidelines promoting the adoption of green leasing, especially in government buildings and commercial real estate, implementation has not been overly successful globally. This study has two focuses, the first of which is to compare green leasing guidelines from various countries and to suggest six comprehensive categories of green leasing components: management relationships, information sharing, certificates, legal stipulations, financial factors, and operation. The second core area of research places government-tenanted properties' lease agreement contracts. The goal is to find any evidence in a legal condition between a building owner and a tenant, in this case federal government, to improve building energy efficiency with less environmental impact in the United States. The findings of the study indicated 41 out of 400 leases had green clauses. Three out of six categories proposed in this study were found in the U.S. government-tenanted properties, while the other three types were not shown. The findings of this study also suggest categories of green leasing clauses can contribute to defining green leasing and provide empirical evidence of green leasing in government-tenanted properties. Ultimately, this study produces arguments for possible reasoning behind the employment of some green lease categories but the lack of use of others, specifically in the U.S. office market and government-tenanted buildings.

## KEYWORDS

green leasing, government-tenanted building, energy efficiency

## 1. INTRODUCTION

Commercial buildings accounted for about 18.5% of total energy use in 2015 in the United States, including delivery energy and electricity-related losses (Energy Information

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Administration, 2016). The occupants of a facility are most often responsible for taking care of a building's environmental footprint because this value is directly related to monetary expenses, such as utility bills. However, this can be different when a facility is leased, making the financial repercussion of a building's operation on leasing and property management important subjects of research. Traditionally, triple net and gross lease models make only one party responsible for most of the costs of building operation. This creates a conflict of interest because a reduction in consumption for one can lead to an investment, or expense, for the other party. Therefore, changes to improve usage are hard to implement. Most tenants and building owners have concern only for their own economic benefits, which inevitably could be translated as a neglect of the environment. This adversarial climate between tenants and owners towards improving energy efficiency and pursuing environmental sustainability in a building is often driven by split incentives. The energy paradox from split incentives exists in leased properties because traditionally a building owner does not receive benefits from the capital expenditure associated with upgrading a building system with energy efficient fixtures when a tenant is in charge of its utility bills through a net-lease agreement. On the contrary, a building owner may not know whether a tenant is mindful about the use of a facility and utilities when a tenant pays a gross rent that includes fixed utility cost, regardless of usage. For the owner, this may not result in a full payback for an upgrade on a building's systems and fixture.

When discussing the energy use of buildings, several factors need to be considered. There are many reasons why the age of a building affects its energy usage, but the impact is not always negative (ENERGY STAR, n.d.). Some old buildings consume much more energy than newer ones, and vice versa, due to changes in building codes, available technologies, architectural trends, and predominant business practices (ENERGY STAR, n.d.). However, regardless of the building's age, appropriate facility operation and maintenance is necessary to manage the building's energy performance level (ENERGY STAR, n.d.). Appropriate facility management, including an efficient energy audit and preventative maintenance schedule, should be employed to ensure a building's energy performance. This practice will be beneficial, regardless of whether or not a building is designed and constructed with sustainable building programs and will be especially valuable when using a long-term lease (10 or more years), as updating building systems is often necessary to improve a building's energy efficiency. The definitions for "green" and "sustainable" go far beyond energy consumption and includes using environmentally friendly products and local material/products, which can affect buildings' overall environmental impact. In a leased space, influence on a building's sustainability relies not only operation and maintenance, but also end-users' (occupants) behaviors.

Developing a cooperative relationship between tenants and building owners is crucial to improving a building's energy efficiency and ensuring the positive environmental impact of a building. In order to provide a solution for this tenant-owner dilemma, the term "green leasing" has been coined. Currently, there are few countries that have excelled in the use of green leasing. While Australia, the United Kingdom, Germany, New Zealand, France, and Canada are leading on this drive, there is a long path to research and development. To that end, this study provides a review of green leasing practices in different countries, as well as a summary of green clauses used in those countries. Based on this information, and on the proposed categories of green clauses, U.S. government-tenanted space lease agreements issued in the states of California and New York are analyzed and reviewed to find any evidence of green clauses.

## 2. GREEN LEASING IN DIFFERENT COUNTRIES

There is no globally understood definition of "green leasing." Hinnells et al. (2008) stated that "all leases can be made 'more green' in the sense of providing a legal framework that facilitates and encourages environmental performance to be part of the conversations and agreements that take place between landlords, tenants and, importantly, facilities managers." Up to now, green leases have not had a fixed form but have facilitated and supported the usage of a building in an environmentally efficient manner (Roussac & Bright, 2012). By its broad meaning, "green leasing (also referred to as 'best practice' or 'performance' leasing) refers to the environmental processes, engagement and practices adopted by landlords and tenants in relation to the building" (Janda, Bright, Patrick, Wilkinson, & Dixon, 2016). With the objective of being greener, some landlords and tenants implement green clauses into their leasing, which can help them meet environmental targets by changing their organizational practice to work more cooperatively. Green leasing intends to increase communications among these parties because they share a common goal of sustainability, whereas traditional leasing lends to more adversairal relationships between the parties (Janda et al., 2016).

### *U.K.*

In both the UK and Australia, the Better Buildings Partnership (BBP) has developed an online tool that provides 20 categories of green clauses, including energy management, performance standards, and sustainable transport (Better Buildings Partnership, 2016). Using this tool, landlords and tenants select types of green clauses and assess to add to their lease to optimize sustainable operations and collaboration throughout the life of commercial leases (Bright, Partick, Thomas, Janda, Bailey, Dixon, & Wilkinson, 2015). In the U.K., lawyers and various consultants created guides and checklists to facilitate and incentivize green leasing (Hinnells, Bright, Langley, Woodford, Schiellerup, & Bosteels, 2008). Government and industry leadership have been crucial to the emergence of green leasing to overcome conservatism and risk-aversion associated with leasing practices, especially for the commercial property sector due to its diversity, building types, and various stakeholders (Bright et al., 2015).

### *Australia*

The Australian Commonwealth and state governments developed a Green Lease Schedule in 2006 for the use by Australian government agencies when letting or renting buildings with the objective of creating a way to address green leasing practices (Bright et al., 2015). In Australia, the other main contributor to the green leasing movement is the Energy Efficiency in Government Operations (EEGO) policy. EEGO aims "to improve energy efficiency, and consequently reduce the whole of life cost and environmental impact of Government operations, and by so doing, lead the community by example" (Australian Department of Climate Change and Energy Efficiency, n.d.).

### *New Zealand*

In 2015, the New Zealand government, the Energy Efficiency and Conservation Authority (EECA), the New Zealand Green Building Council (NZGBC), and DLA Piper New Zealand released the "Performance Leasing Guide and Model Clauses" (Energy Efficiency and Conservation Authority, 2015). This toolkit offers examples of lease clauses with the aim of improving building performance and achieving higher overall asset value by fostering the

interaction between the tenant and the lessor. The examples of green clauses that the Guide provides are available to be readily adapted in new contracts, according to the different necessities of the parties. Possible concerns and high-level mitigation strategies are also discussed in the Guide. The clauses are divided into four different clause categories: 1) cooperation and management, 2) consumption, waste, and recycling, 3) specifications and standards, and 4) compliance and costs (Energy Efficiency and Conservation Authority, 2015).

### *France*

According to Article L 125-9 of the French Environmental Code, the Environmental Annex ("l'annexe environnementale") is mandatory in every lease (Sakda & Fournier, 2013). Since January 1st, 2012, every new lease or lease renewal for facilities of 2,000 $m^2$ (21,527.82 SF) or larger for office or commercial use must include this environmental annex. Also, in order to implement this regulation, all existing leases had to include it before July 14th, 2013. Sakda and Fournier (2013) explained the Environmental Annex in detail—the Annex is a mutual commitment to reduce energy bills, control the environmental footprint, and meet new regulatory requirements between a tenant and a lessor. Its objective is to make a contractual plan of energy and environment progress for the property concerned. To remain in compliance, the lessor must record the complete description and the energy characteristics of all existing equipment in the building. The lessor must also specify the annual consumption of energy and water, as well as the production of waste from the rented premises and equipment used. The tenant must include details relating to installation of equipment, their annual energy and water consumptions, and their production of waste.

### *Germany*

In Germany, landlords and lessors are increasingly interested in making their buildings and leasing contracts more sustainable to abide by emerging "green" regulations. Most leasing contracts currently have a brief section or a few clauses that discuss sustainability. Usually, these clauses contain only non-binding declarations of intent by both parties, but are frequently biased in favor of the landlord (DLA Piper, 2015). With the objective of providing an all-encompassing guideline to drive the development of sustainable clauses that favor all parties of the lease and shares the potential offered by green leases more effectively, an interdisciplinary working group was formed in 2009. In 2015, the final result of this initiative was published as the German Market Toolkit (DLA Piper, 2015), and provided a set of recommended clauses and actions for sustainable building use. Even though the German government was present in the creation of this toolkit through the the Büro für integrierten Umweltschutz, it is not required by the law.

### *Singapore*

In 2014, the Building and Construction Authority (BCA) of Singapore created a green lease toolkit to aid landlords and tenants in their work together to improve their environmental performance over the life of the building they own or occupy (Building and Construction Authority, 2014). With the goal of encouraging the use of this toolkit into every sector of the real estate industry, the Singaporean BCA created two versions of this toolkit: the Office Green Schedule 2014 and the Retail Green Schedule 2014. The two editions of the toolkit allow landlords and tenants to modify and adopt the clauses according to their needs and sector protocols. The toolkits provides minimum and additional standards for landlords and tenants to increase adaptability.

### *Canada*

Over the past decade, Canada has seen success implementing green leases, which have been widely encouraged to address the large consumption by owners and tenants of both renewable and non-renewable resources throughout North America. The Real Property Association of Canada (REALpac) (2010) has been a leader in green leases, and was the driver in producing a commerical office lease that was modeled after existing launguage used by the National Standard Office Lease. By marrying these two leases so closly, a precedent has been set and embraced by many major Canadian landlord association. This new standard for lease language is also flexible, as it can be used by all parties in a lease, and is appropriate for both small and large organizations (Real Property Association of Canada, 2010). These leases are not only aimed at legally requiring tenants and landlords be more environmentally responsible, but also creating a longer term sustatinablily for the actual buildings. Green leases in Canada address "environmentally preferable products, water conservation measures, energy efficiency standards, indoor air quality standards, ventilation requirements, type of office equipment, HVAC specifications, lighting requirements, allowable cooling, heating & humidity, construction specs (core, shell & interior), and tenant amenities" (Real Property Association of Canada, 2010).

### *U.S.*

In the U.S., there have been initiatives to promote green leasing by both governments and non-profit research organizations, such as the U.S. General Services Administration (GSA) and the Institute for Market Transformation (IMT). In 2012, Rocky Mountain Institute (RMI) and the Building Owners and Managers Association (BOMA) International partnered and developed the guide for commercial properties, Working Together for Sustainability: The RMI-BOMA Guide for Landlords and Tenants. The California Sustainability Alliance (2014) also designed a toolkit with the objective of assisting lessors and tenants to choose the most appropriate green clauses pertinent to their building type when writing a lease (Green Leases Toolkit, 2009).

In 2014, A Better City created a green leasing strategy with the objective of reducing energy use and greenhouse gas emissions in the city of Boston. This strategy consists of four types of clauses to increase the sustainability of leases: pass-through, operation cost, sustainable purchasing, and reporting (A Better City, 2014). The pass-through clause intends to address the split-incentive issue, in which capital costs in efficiency can also be passed to the tenants. Operation cost clauses establish operational parameters for the leased facility, which may include, for example, recycling, materials, waste practices, and operation hours. Sustainable purchasing clauses incentivize the purchase of certified environmental materials like VOC-free paints, cleaning supplies, and ENERGY STAR certified appliances. Finally, reporting clauses state reporting requirements on the performance of the building and require the sharing these data between the parties involved in the contract with the aim of tracking the energy and sustainability goals.

Like other green initiatives, green leasing requires support from the government, research institutes, and companies that are all large enough to produce long-term plans and adopt new practices while they are still new in the market. In this sense, the government plays a vital role in defining green leasing, establishing standards, and disseminating relevant information and benchmarking examples. Specifically, the GSA is a single entity which owns and leases spaces across the nation. According to its reports the GSA owns and leases over 376.9 million square feet of space in 9,600 buildings in more than 2,200 communities nationwide (General Services Administration, 2018). GSA's 9,600 properties include 8,100 GSA leases (84.4%) and 1,500 government-owned buildings (15.6%). Based on these numbers, the GSA owns only

one out of every six buildings that they occupy; the remaining five are leased (General Services Administration, 2018). GSA promotes sustainable buildings by using different green policies in its lease documents. Its relevant policies have been issued in six different letters: 1) RSL-2007-12: Green Lease Policies and Procedures for Lease Acquisition, 2) RSl-2010-2: ENERGY STAR® Requirement for Lease Acquisition, 3) LAC 2011-13: Sustainability Update, 4) LAC-2015-02: PBS Key Sustainable Products, 5) LA-FY17-03: Leasing Alert-Green Building Rating Certifications for New Construction and Tenant Interiors: LEED and Green Globes, and 6) LA-FY17-07: Leasing Alert-Net of Utilities Lease Structure (General Services Administration, 2017). The last two letters became effective after this study was conducted. Each letter is explored further.

First, the Realty Services Letter, Green Lease Policies and Procedures for Lease Acquisition, (RSL-2007-12) describes the outlines that implement energy and environmental leasing requirements (RSL-2007-12, 2007). It explores new green language for all leases to facilitate the creation of new documents. This letter also explains all requirements that a facility needs to be present before the lease starts, including: walkable access to public transportation, banks, workshops, and other commercial establishments, controlled healthy indoor air during construction, usage of suitable materials and products accepted by EPA, LEED qualification or ENERGY STAR Label, the lessor is responsible for all repairs, janitorial policies, and cleaning products to be used.

Second, the ENERGY STAR® Requirement for Lease Acquisition (RSL-2010-2, 2010) mandates ENERGY STAR certification for all buildings to be leased after December 19, 2010. Even if a building is exempt from the mandatory ENERGY STAR requirement, it needs to be renovated for energy efficiency and conservation improvements that would be cost effective over the life of the lease (General Services Administration, 2017).

Third, the Sustainability Update, LAC 2011-13 reinforces the green requirement for a facility and explains more specific actions that must be performed before the effective date of the lease (LAC 2011-13, 2011). One of the most important updates is the implementation of a consumption report that needs to be done every quarter of the year by the lessor/landlord. This report should present the monthly consumption of the different utilities that the tenant uses in the leased space, or the entire building, depending on the occupancy. Mostly, all requirements in this document are related to the construction phase or the conditioning of them prior to the lease start. LEED, ENERGY STAR, and Green Globes are highly desired certifications, according to this document.

Fourth, the extra Lease Acquisition Circular, LAC 2015-02, which issues the implementation of Key Sustainable Products (KSP) (LAC 2015-2, 2015). This consists of material and products (i.e., cleaning and paper products) that have a lower environmental footprint. The lessor more often assumes these policies. The effective date was the date of issuance, which was April 15, 2015, and the LAC requires to apply all GSA leasing cases including activities delegated by GSA. (General Services Administration, 2017).

Fifth, Leasing Alert-Green Building Rating Certifications for New Construction and Tenant Interiors: LEED and Green Globes (LA-FY17-03) includes Green Globes in a green building certification of new lease construction projects and optional tenant interiors in addition to LEED. These two options can help enhance adaptability of green building rating systems by covering wider types of buildings and spaces than before. This leasing alert has been effective since December 13, 2016.

Lastly, Leasing Alert-Net of Utilities Lease Structure (LA-FY17-07) intends to save utility energy consumption and costs by using net of utilities lease structure. As a tenant agency pays utility fees directly, GSA expects to incentivize the agency to voluntarily reduce energy consumption. This alert limits applicable cases where lease size is larger than 50,000 rentable square feet with 100% occupancy. There are six other conditions to consider: a high-energy user, a tenant agency with net of utilities infrastructure, budget ability of a tenant agency, payment of utility fees by a tenant agency, leadership, and the location where GSA can purchase discounted bulk of energy on behalf of a tenant agency. The conditions were determined based on the results of several studies by the National Office of Leasing, which analyzed the amount of utility cost saving and administrative expenditure of managing net utilities. It has been effective since March 29, 2017.

### *A summary of green clauses in different countries*

The summary table was created with the objective of identifying the major green clauses used in different countries. Using the available toolkits and examples of green leases from Australia, Canada, France, Germany, New Zealand, Singapore, the U.K., and the U.S., green clauses were classified into six categories. Table 1 shows the six main categories of green leasing clauses based on the documents previously highlighted from different countries, as well as whether a green clause is shown in each country's representative green leasing guides/toolkits. The final classification consists of:

1. ***Management Relationships:*** This clause describes how to control and manage the interaction between the parties involved in the lease through cooperation and meetings. Cooperation refers to all policies that mandate the interaction between the property owner and tenant in the matter of energy consumption and related fields. Meetings are contractually set to address green matters, with both parties present.
2. ***Information Sharing:*** This clause controls all information sharing. *Tenant consumption*, states tenants' obligation to report and share their energy consumption history and their activities (use of the facility) from their previous (leased) facility as a reference point before making the lease effective. *Building consumption*, demands that the landlord produces a report with the consumption of resources that the building needs to work without occupants. These two clauses set a starting point to create plans to manage and/or reduce consumption. Finally, *consumption tract*, requires a responsible party to report and track the building energy performance over time and notify any variance.
3. ***Certificates:*** This clause requires a building owner/operator to achieve a sustainable building certificate during, or prior to, the occupancy of the facility.
4. ***Legal Stipulations:*** This clause includes all legally related policies, including penalties, obligations, alteration restrictions agreed by a tenant and a lessor, and conflict resolution. Alteration restrictions establish who can modify the property, and this policy often prevents conflicts between parties when altering the leased space. Notably, alteration restrictions help a tenant mitigate the barrier of altering the leased space in a more environmentally efficient way. In a traditional lease agreement, the tenant is required to return the leased space to its original condition, and this often prevents the tenant to improve the leased space on their own during the contract period.
5. ***Financial:*** Financial benefits are contractually set to incentivize excellent performance of one or both parties. On the other hand, pass-through policies make both parts of the

contract share expenses regarding building performance improvements. In traditional contracts, the landlord often covers the entire cost of improvements.

6. ***Operation:*** This category contains all clauses that require the use of environmentally friendly cleaning products and materials during the lease contract period. It also takes into account whether recycling is contractual or not.

**TABLE 1.** Six categories of green clauses based on green leasing documents from different countries.

| Green Clauses | BBP (UK, AUS) | NZ | FRA | GER | SGP | CAN | GSA (USA) | ABC (USA) |
|---|---|---|---|---|---|---|---|---|
| **Management relationship** | **2** | **1** | **2** | **2** | **2** | **2** | | |
| Co-operation | X | X | X | X | X | X | | |
| Meetings | X | | X | X | X | X | | |
| **Information Sharing** | **3** | **3** | **3** | **3** | **3** | **3** | **2** | **1** |
| Tenant Consumption | X | X | X | X | X | X | | |
| Building Consumption | X | X | X | X | X | X | X | |
| Consumption track | X | X | X | X | X | X | X | X |
| **Certificates** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | |
| Performance Certificates | X | X | X | X | X | X | X | |
| **Legal Stipulations** | **5** | **5** | **3** | **3** | **1** | **3** | **1** | **2** |
| Penalties | X | X | X | | | | | |
| Obligation | X | X | X | X | X | X | | |
| Alteration Restriction Tenant | X | X | | X | | X | X | X |
| Alteration Restriction Lessor | X | X | | X | | X | | X |
| Conflict Resolution | X | X | X | | | | | |
| **Financial** | **1** | **1** | **2** | **1** | | | | **1** |
| Pass-through Cost | X | X | X | X | | | | X |
| Incentives | | | X | | | | | |
| **Operation** | **3** | **3** | **3** | **2** | **3** | **3** | **3** | **3** |
| Cleaning Products | X | X | X | X | X | X | X | X |
| Materials | X | X | X | X | X | X | X | X |
| Recycling | X | X | X | | X | X | X | X |

Countries mentioned above address green leasing in different manners. A country may have firm legal support, as is the case in France, but commonly, green toolkits and other initiatives are commanded by governmental entities. Regardless of the initiating bodies, green policies in the aforementioned countries have several similarities. Specifically, most countries emphasize the collaboration between a tenant and a landlord to promote green leasing, the benefits of sharing and tracking the leased facility consumption performance, and the use of eco-friendly products related to the operation of the building.

## 3. METHODOLOGY

This study utilized the document content analysis of the U.S. GSA's leasing contracts. After the 15th of each month, the GSA posts an updated lease inventory, called "Monthly Lease Inventory." This is a downloadable Excel spreadsheet that contains data of the properties that the government lease for providing the workplace for half of its employees, including buildings, land, and antenna sites (General Services Administration, 2018). The GSA's lease agreements in California from 1992 to 2016 and those in New York from 1972 to 2016 were obtained from the GSA website. This document summarizes the information of 8258 properties leased by GSA across the country including location, building address, lease period, lease effective and expiration dates, percent occupied, renewal option term left, current annual rent, termination right left, lease agreement rentable square footage, lease structured and surface parking, and field office names.

There was a total of 735 GSA-leased properties in the state of California and 347 in the state of New York. Among them, 323 lease agreement contracts in California and 77 contracts in New York were accessible. California and New York were the top two states that had the most lease contracts available and both states were proactive in adopting sustainable practices. The content of these available lease agreements was analyzed to find evidence of green clauses. After acquiring a total of 400 contracts for both California and New York, the authors reviewed them with the intention of finding any clause related to sustainability, recycling, energy efficiency, or any other practice related to environmental care. The researchers read the entire contracts in order to ensure the variation of green leasing related wording in the contracts as another similar study (Bright & Dixie, 2014) pointed out through their content analysis of lease agreement contracts. While carefully reviewing the leasing agreements, six new columns were added to the existing Excel table to include characteristics of the leased properties for further analysis: 1) availability of lease agreements details whether or not the corresponding lease document was found, 2) utility recognizes the interaction between the lessor and the tenant in the matter of paying utilities to detail if one was entirely in charge or parties shared the responsibility at some level, 3) overtime usage is related to the cost of using a leased space outside of agreed regular hours, 4) operation and maintenance sets the responsibility of the costs associated with operation and maintenance of the facility, 5) update and repair sets the responsibility of the costs of update and repair of the facility, and 6) green clauses as well as interactions of the two parties in regard these clauses, were documented.

Finally, after gathering all information, descriptive and inferential statistics were conducted to determine whether any feature of the facility has a direct relationship with the green clauses. Furthermore, green clauses that were found in the GSA's leasing agreements in California and New York were analyzed and compared with categories that the authors combined from green leasing manuals or guidelines from several countries. Most lease contracts had several lines and

paragraphs crossed out to prevent the disclosure of personal data of the landlords and confidential information of the government. In some cases, entire paragraphs, where information seemed not to be related with confidential information, were missing or crossed out. Though it is not possible to determine if this was intentional or not, this is a source of uncertainty in this study.

## 4. RESULTS

Of the 735 leased GSA properties in California, approximately 44% had contract documents available to study (Table 2). These 323 contracts where the primary source of information used to understand the current status of green leasing in the GSA. Only 23 of these contract documents contained a clause regarding sustainability, while 42 "green clauses" were found in the contracts. Following the classification presented in this paper in Table 1, of the 42 green clauses, 22 were related to Operational, 7 related to Certificates, 2 about information sharing, more specifically, tracking of energy consumption (Table 3). In regard to the operational clauses found, 13 of them addressed cleaning products and materials, and 9 outlined recycling policies. Beside these three categories of green leasing clauses, there were clauses related to preventative maintenance to reduce energy inefficiency, specific energy efficiency improvements, and radon testing. These do not fall into the six categories of green clauses in Table 1. There were also five lease documents that included unspecified energy efficiency improvements. These had a lack of explanation or important parts of the policies were removed.

With the aim of uncovering if a significant correlation exists between any of the characteristics of the leased properties and the existence of green clauses in their contracts, the California dataset was processed using JMP statistical software. Though no significant correlation was found, analyzing these 23 documents and comparing their characteristics points to growth in usage of green leases. Before 2011, clauses considered as green were almost inexistent. Table 2 contains a brief description of the nine policies that were present in these 23 documents of focus.

The same study was performed with the GSA's leased properties in the state of New York, and the results did not vary significantly from the data obtained in California. In New York, from 347 leased properties reported, only 77 had a contract available, and from those, 18 leases included a green clause (Table 4). Each of these leases contained only one green clause. Fifteen leases committed the landlord to get energy efficiency certificates, more precisely; ENERGY STAR (14 leases) and LEED (1 lease). According to the classification earlier in this paper, this type of policy belongs to Certificates. The other three green policies where non-specified without detailed information, therefore, they cannot be assigned to any category. Non-specified, "Energy Savings Initiatives," some contracts had titles depicting green policies, but they were never explained further down the document. The following descriptions are the examples of the green clauses found in New York's GSA lease documents:

> ENERGY STAR: *"Prior to occupancy, and at no additional cost to the Government, the Lessor shall use commercially reasonable efforts to renovate the space for any energy efficiency and conservation improvements that would be cost effective over the firm term of the lease, thereby reducing electricity or fossil fuel consumption, water, or other utility costs. However, in the event the Lessor obtains the Energy Star label prior to the Government's occupancy, the Lessor shall not be required to renovate the space for these improvements."*
>
> LEED: *"The Lessor agrees that a total construction cost of $782,500.00 is required to prepare the premises for the Government's use and occupancy. This amount is based on the drawings*

**TABLE 2.** Available lease documents and green clauses in California, 1992–2016.

| Year | Leased Properties Reported | Leases with Document Available | Leases with Green Clauses | % of Documents with at least One Green Clause | % Properties with Lease Document Available |
|---|---|---|---|---|---|
| 1992 | 1 | 0 | 0 | — | 0.00% |
| 1993 | 0 | 0 | 0 | — | — |
| 1994 | 1 | 0 | 0 | — | 0.00% |
| 1995 | 3 | 1 | 1 | 100.00% | 33.33% |
| 1996 | 1 | 0 | 0 | — | 0.00% |
| 1997 | 5 | 0 | 0 | — | 0.00% |
| 1998 | 3 | 0 | 0 | — | 0.00% |
| 1999 | 3 | 0 | 0 | — | 0.00% |
| 2000 | 6 | 0 | 0 | — | 0.00% |
| 2001 | 4 | 0 | 0 | — | 0.00% |
| 2002 | 12 | 0 | 0 | — | 0.00% |
| 2003 | 12 | 0 | 0 | — | 0.00% |
| 2004 | 20 | 0 | 0 | — | 0.00% |
| 2005 | 20 | 0 | 0 | — | 0.00% |
| 2006 | 36 | 0 | 0 | — | 0.00% |
| 2007 | 41 | 0 | 0 | — | 0.00% |
| 2008 | 44 | 0 | 0 | — | 0.00% |
| 2009 | 45 | 0 | 0 | — | 0.00% |
| 2010 | 63 | 55 | 0 | 0.00% | 87.30% |
| 2011 | 123 | 116 | 13 | 11.21% | 94.31% |
| 2012 | 88 | 80 | 4 | 5.00% | 90.91% |
| 2013 | 73 | 53 | 4 | 7.55% | 72.60% |
| 2014 | 63 | 18 | 1 | 5.56% | 28.57% |
| 2015 | 45 | 0 | 0 | — | 0.00% |
| 2016 | 23 | 0 | 0 | — | 0.00% |
| **Total** | **735** | **323** | **23** | **7.12%** | **43.95%** |

**TABLE 3.** Description and example of the green policies found in California lease contracts.

| Number of Repetitions | Main Policy Topic | Policy Description | Example from the Lease Contracts (cited directly from leasing contracts) |
|---|---|---|---|
| 13 | Eco-Friendly Cleaning Products | Address the usage of cleaning products that are environmentally friendly. Also focuses on the product's components (either recycled or/and environmentally beneficial) and packaging | *"B. SELECTION OF CLEANING PRODUCTS:*<br>*The Lessor shall make careful selection of janitorial cleaning products and equipment to:*<br>*1. Use products that are packaged ecologically;*<br>*2. Use products and equipment considered environmentally beneficial and/or recycled products that are phosphate-free, non-corrosive, non-flammable, and fully biodegradable; and*<br>*3. Minimize the use of harsh chemicals and the release of irritating fumes.*<br>*C. SELECTION OF PAPER PRODUCTS: The Lessor shall select paper and paper products (i.e., bathroom tissue and paper towels) with recycled content conforming to EPA's Comprehensive Procurement Guideline."* |
| 9 | Required Recycling Programs | Policies that set standards for a recycling program. | *"RECYCLING (DEC 2007) Where State or local law, code, or ordinance requires recycling programs (including mercury containing lamps) for the space to be provided pursuant to this Lease, the Lessor shall comply with such State and/or local law, code, or ordinance in accordance with GSA Form 3517, General Clauses, 552.270-8, Compliance with Applicable Law. During the lease term, the Lessor agrees, upon request, to provide the Government with additional information concerning recycling programs maintained in the building and in the leased space."* |
| 6 | ENERGY STAR | ENERGY STAR label required. | *"ENERGY EFFICIENCY CONSERVATION (SEP 2010)*<br>*A. Existing buildings must have earned the Energy Star label in the most recent year or will have obtained it prior to lease award, unless the offered space meets one of the statutory exceptions listed below. All new construction shall achieve an Energy Star label within 18 months after occupancy by the Government. The Offerer is encouraged to include shared savings in the offer as a result of energy upgrades where applicable.*<br>*The term "most recent year" means that the date of award of the Energy Star label by EPA must not be more than 1 year prior to the lease award date. For example, an Energy Star label awarded by EPA on October 1, 2010 is valid for all lease awards made on or before September 30, 2011."* |
| 1 | Radon Tests | Radon Tests required with minimum results. | *"Radon test results as may be required by the "Radon in Air" and "Radon In Water" paragraphs in the FIRE PROTECTION, LIFE SAFETY, AND ENVIRONMENTAL ISSUES section of the Solicitation for Offers (SFO)."* |
| 1 | LEED® | LEED® certification required. | *"If this SFO requires a LEED® Certification, the name of the proposed LEED® Accredited Professional (AP) team member and qualifications document for integrative design practice must be provided."* |

| Number of Repetitions | Main Policy Topic | Policy Description | Example from the Lease Contracts (cited directly from leasing contracts) |
|---|---|---|---|
| 4 | Specific Energy Efficiency Improvements | This policy provides contractual commitment of one or both parties, while taking into account the unique condition of each facility. | *"Pursuant to Paragraph 3.6 of SFO Number OCA2856, 'Green Lease Submittals,' the Lessor will make the following improvements to enhance the building's energy efficiency and conservation: upgrade the HVAC system to enhance the thermostat controls, change existing light bulbs to fluorescent, replace the existing water heaters, install new low flush toilets, and install new solar power system. These improvements must be completed no later than one (I) year after signing the lease pursuant to Paragraph 8.3. E.2. of SFO Number OCA2856, 'Energy Efficiency and Conservation'."* |
| 1 | Preventative Maintenance to Reduce Energy Inefficiency | Promotes the creation of a Building Management Plan to guarantee the maintenance of appliances with the objective of reducing energy consumption. | *"Building Management Plan outlines preventive maintenance for both conditional-monitoring and life-extending tasks which are scheduled at regular intervals. The Plan's goals are:*<br>• *To extend the life of the building components by reducing inefficiencies in operation and energy usage*<br>• *To ensure preventative maintenance includes regular inspections and replacement of equipment crucial to operating a building*<br>• *To empower maintenance staff to reduce problems that might otherwise lead to operating failure*<br>• *To protect the physical integrity of building components through preventive maintenance, preserving a safe environment*<br>• *To prevent minor problems from escalating into major system and equipment failures that result in costly repairs*<br>• *To reduce time spent reacting to crises."* |
| 2 | Light Data, Savings and Control | Monthly control and report to used track the overall energy consumption. | *"Light Loggers, further described in Exhibit F, attached here to and made a part here of, shall monitor the time that the Sample Lights are turned on. Cost savings shall be calculated by determining the average total time that the Sample Lights are turned on during each month, and extending that number by the total number of fixtures, the energy saved per fixture (as described in Exhibit E, attached here to and made a part hereof), and the incremental rate per kilowatt-hour ("KWH") per the Lessor's monthly utility bill."* |
| 5 | Unspecified Energy Efficiency Improvement | Policies that detail any energy efficiency improvements. Lack of explanation or important parts of the policies have been removed. | "Such improvements may consist of, but are not limited to, the following:<br>a. Heating, Ventilating, and Air Conditioning (HVAC)<br>b. Lighting Improvements<br>c. Building Envelope Modifications." |

**TABLE 4.** Available lease documents and green clauses in New York, 1972–2016.

| Year | Leased Properties Reported | Leases with Document Available | Leases with Green Clauses | % of Documents with At least One Green Clause | % Properties with Lease Documents Available |
|---|---|---|---|---|---|
| 1972 | 1 | 1 | 0 | 0.00% | 100.00% |
| 1973 | 0 | 0 | 0 | — | — |
| 1974 | 0 | 0 | 0 | — | — |
| 1982 | 1 | 1 | 0 | 0.00% | 100.00% |
| 1983 | 0 | 0 | 0 | — | — |
| 1990 | 2 | 0 | 0 | — | 0.00% |
| 1991 | 2 | 0 | 0 | — | 0.00% |
| 1992 | 2 | 0 | 0 | — | 0.00% |
| 1993 | 0 | 0 | 0 | — | — |
| 1994 | 3 | 0 | 0 | — | 0.00% |
| 1995 | 2 | 0 | 0 | — | 0.00% |
| 1996 | 6 | 0 | 0 | — | 0.00% |
| 1997 | 6 | 0 | 0 | — | 0.00% |
| 1998 | 5 | 0 | 0 | — | 0.00% |
| 1999 | 8 | 1 | 0 | 0.00% | 12.50% |
| 2000 | 12 | 1 | 0 | 0.00% | 8.33% |
| 2001 | 15 | 0 | 0 | — | 0.00% |
| 2002 | 17 | 0 | 0 | — | 0.00% |
| 2003 | 16 | 0 | 0 | — | 0.00% |
| 2004 | 12 | 0 | 0 | — | 0.00% |
| 2005 | 27 | 0 | 0 | — | 0.00% |
| 2006 | 18 | 0 | 0 | — | 0.00% |
| 2007 | 9 | 0 | 0 | — | 0.00% |
| 2008 | 15 | 0 | 0 | — | 0.00% |
| 2009 | 23 | 2 | 0 | 0.00% | 8.70% |
| 2010 | 16 | 10 | 0 | 0.00% | 62.50% |
| 2011 | 36 | 29 | 5 | 17.24% | 80.56% |
| 2012 | 34 | 30 | 12 | 40.00% | 88.24% |
| 2013 | 19 | 2 | 1 | 50.00% | 10.53% |
| 2014 | 15 | 0 | 0 | — | 0.00% |
| 2015 | 21 | 0 | 0 | — | 0.00% |
| 2016 | 4 | 0 | 0 | — | 0.00% |
| **Total** | **347** | **77** | **18** | **23.38%** | **22.19%** |

*and specifications dated December 22, 2011, including all comments issued to the Lessor on these drawings and specifications (Exhibit "B") and the LEED specifications, dated December 9, 2011. The cost includes, but is not limited to, overhead and profit, any applicable sales tax, expediting fees, building department fees, overtime work, and freight elevator charges."*

The percentage of lease agreements containing at least one green clause in California was 7.12%, with the most common type of clause being operational followed by certificates. More specifically, the use of sustainable cleaning products was detailed. Conversely, New York presented that 23.38% of contracts contained green clauses, with most policies focusing on certificates, especially ENERGY STAR. Overall, it is possible to conclude that certificates were a prevalent type of clause present in both states. Certificates are preferred by the lease parties for pre-existing conditions in a building instead of a bilateral commitment as the certificates provide an energy efficient building at the beginning of the contract and normally no follow-up is required in this matter. Of the lease contracts of the U.S. government-tenanted properties included in this study, three categories of green clauses were identified that were comparable with the *Operational*, *Certificate*, and in some way, the *Information Sharing* present in the other countries studied. However, this last category is not overly developed in the U.S because only 2 out of 400 documents presented an information sharing clause. Additionally, clauses regarding the other three categories (management relationship, legal stipulations, and financials) were not found.

## 5. DISCUSSION

As green leasing grows in adoption, studies like this will fuel understanding and support. By scrutinizing the tools and guides that are used in other countries, the content of these materials can be analyzed to determine what works and what does not, as well as what techniques might transfer well to the U.S. leasing culture. Additionally, by understanding the background of these guides in other countries, the level of government and organizational support needed to successfully launch green leasing can be examined.

After digesting the green leases and green clauses documentation from various countries, the researchers were able to create six comprehensive categories of green leasing clauses. The comprehensive green leasing categories can provide a reference point when a building owner or a tenant considers implementing green leasing clauses in their lease agreement. These categories are: management relationships, information sharing, certificates, legal stipulations, financial factors, and operation. These categories were then applied against the information collected from the GSA, and its tenanted properties. The data available from the GSA's previous lease agreements pointed towards limited green lease usage but allowed for existing clauses to be categorized into the newly proposed groupings. The present study showed the limited adoption of green leasing practices in the GSA's lease agreement contracts compared to a similar study conducted in the U.K. by Bright and Dixie (2014), however, their study only included 26 lease agreements in green buildings. Exclusion of non-green buildings might cause the bias of sampling on the dependent variable.

Through this research of both the tools offered in other countries that encourage green leasing, as well as the current usage of green lease clauses throughout the U.S. government-tenanted properties, specifically those leases held by the GSA, multiple findings were produced. First, although green leasing is gaining popularity around the world, there is no globally

understood definition of the term "green leasing" and this can create barriers to cross-cultural translation. Second, green leasing can be an instrumental legal tool to overcome the long-standing dilemma of split incentives between a building owner and a tenant, and ultimately by removing the energy paradox, can be the driver to improve a building's energy efficiency. The third outcome of this research shows that government-tenanted buildings can play a key role in pioneering various green leasing clauses and convey the impacts of implementing such clauses on a building's energy performance and sustainability to the tax-paying public. The GSA should consider implementing additional green leasing clauses in future lease agreements to test their effectiveness. Lastly, the fourth finding is tied to the progression of government-tenanted buildings and their specific use of green clauses that focus heavily on the pre-existing conditions of green building certifications instead of implementing clauses that imply any action during the lease life (Oberle & Slobada, 2010).

While the six categories presented are comprehensive against the information analyzed from Australia, Canada, France, Germany, New Zealand, Singapore, the U.K., and the United States, these groupings may not be exhaustive because the pool of countries was limited. Additionally, the study was only able to utilize GSA leasing documents that were available to the public on the Administration's website. Gaining access to non-disclosed lease agreements may provide more evidence of true green leasing. Also, although the GSA does make some of their leasing agreements publicly available, those that included in this study are limited to the states of California and New York. Lastly, the recent lease agreements might have more green clauses related to the two recently released leasing alerts, LA-FY17-03 and LA-FY17-07, which have been effective since December 2016 and March 2017, respectively. The first leasing alert-green building rating certifications for new construction and tenant interiors: LEED and Green Globes (LA-FY17-03) is related to green building certificate in the six green leasing categories proposed in this paper. However, the second leasing alert-net of utilities lease structure (LA-FY17-07) is unique in a sense that net of utilities lease structure can motivate tenant agencies to decrease energy consumption yet it increases the administrative burden when the utilities are paid by GSA. This leasing alert applies to GSA's unique structure of having tenant agencies, similar to sub-lease, but can help GSA diversify its leasing structure where majority of its current leases are fully-serviced.

## 6. CONCLUSION

Based on the research conducted to uncover the proficient usage of green leases, it can be concluded that while green leases, or green clauses, are increasing in popularity, they are still very much in an early development phase. Strong support has been shown in favor of green leases in Australia, the U.K., and Germany, and green leasing guides and tools produced in these countries were reviewed and compared to create comprehensive categories of green leasing. While green leasing has been received well abroad, the United States remains slower to adopt these new leasing methods. This study hones in on the role that the government can plan in shifting conceptions. Given the large amount of property that the GSA tenants, and the accessibility of information, this government-tenanted lease documents were of prime focus in this study. The findings indicate that, in fact, green leasing has not been progressively adopted over the past handful of years.

Because green leasing is still in its infancy, research should continue in order to provide evaluation and guidance for growth. This study focuses specifically on GSA tenanted leases

in the states of California and New York, but future research could be expanded to include an analysis of leases from other states. In doing this, diversity of state laws and requirements could be explored to determine what supplemental support, by way of legislation, green leases require in order to be successful. These state-specific green leasing regulations, combined with guides and other tools, can be investigated to understand where, and why, green leases are thriving. Beyond exploring green leases associated with GSA tenanted buildings from coast to coast, a collaboration could be established with the GSA. By working with the Administration directly, future researchers may gain access to information that has been blacked out to the general public. With updated data, GSA's newly released lease agreements can be monitored and analyzed to find more evidence of green leasing. Collaborating with the GSA could also set the precedent for extensive research on government tenanted buildings around the world, such as those leased by the State Department.

With such a high level of energy consumed, second only to the residential sector, commercial real estate should also be explored. By adding commercial properties to the sample set, the split incentive in this sector can be explored and compared to the paradox in residential buildings. Including a sample of commercial properties across multiple states, and owned by different lessors, could supplement the smaller scope of properties examined in this study. Fully adopting green leasing could mean positive, long term impact for the real estate industry. Supporting these lease terms will point towards strong partnership between tenants and owners, with the end goal being a mutual goal of environmental sustainability. Solving the issue of split incentives will be a strong step forward and will perpetuate adoption of green leasing across sectors. Given the novelty of green leasing, ongoing research and promotion will need to be conducted to provide concrete guidelines. Once these guidelines and successful narratives can be provided, industry standards will transform what can now feel like a legal nightmare and biased lease agreement.

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