

Open University of Cyprus

Faculty of Pure and Applied Sciences

Postgraduate (Master's) Programme of Study
Sustainable Energy Systems

Postgraduate (Master's) Dissertation



Energy Management Practices in Office Buildings
Development of an Energy Management System For a Small
Medium Enterprise

George Louca

Supervisor
Dr. Paris Fokaides

April 2020

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This postgraduate dissertation was partially fulfilled by the requirements for obtaining a postgraduate degree in Sustainable Energy Systems from the Faculty of Pure and Applied Sciences of the Open University of Cyprus.

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Summary

Energy Management constitutes one of the main areas of sustainable energy practices. Especially in the building sector, energy management constitutes a significant operation which may assist an organization, in this case a small medium enterprise to reduce the required resources, financial and natural in order to achieve energy performance. A series of directives and standards, have been developed concerning the procurement of energy audits and energy management of the built environment.

A main tool for the energy performance of the built environment is the energy management system (EnMS). The system is a systematic process for continual improvement in energy performance that maximizes energy savings of the organization. The main characteristic is to engage and encourage personnel at all levels of an organization to manage energy use on an everyday basis and it involves all levels and functions of the organization and requires the commitment of top management.

The purpose of the study is to implement energy performance guidelines on a small medium enterprise through an energy management system (EnMS) based on the ISO50001:2018. To serve the above, an energy policy of the organization was formulated, a detailed energy consumption analysis was conducted of past and present use, significant energy uses were identified and an energy baseline was constructed. Also a fully developed energy plan manual and an energy management system procedure manual are created. The objectives and targets of the organization were identified and agreed among the management. It is also noted, in order for informed decisions to be taken and to choose fit for purpose energy efficiency measures and furthermore to formulate the suitable action plans a synoptic energy audit of the small medium enterprise was conducted.

Lastly, conclusions are drawn regarding the implementation of the energy efficiency measures and the energy management system by small medium enterprises.

Acknowledgments

This dissertation was partly written in the middle of a total lockdown in Cyprus due to a new virus called COVID-19. After 30 days staying home you come to evaluate simple things like be able to go out for a walk or play with your children in the dirt or have a cup of coffee with friends.

This dissertation is dedicated to my partners' in crime. My beautiful wife, which without her support nothing would be possible. To my two little rascals that never kept me fully concentrated to finish this project. Chloe and Constantinos remember that failing is the first step of success.

To my supervisor Dr. Paris Fokaides for all his valuable help and understanding at the preparation of this thesis.

To Stelios Americanos LLC Law Firm, especially to Mr. Stelios Americanos, Mrs. Despina Americanos and Mrs. Miranda Symeou for their acceptance and understanding and providing all information necessary for the preparation of the thesis.

To myself as I have been in and out of university classrooms and amphitheatres the past twenty years and still not lost my spark, I think.

To all Olympiakos Nicosia supporters in the Universe I salute you!

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Chapter 1

Importance of Energy Efficiency in Buildings

Environmental protection, use of natural resources and energy consumption and performance are the tip of the European Policy and Legislation. The European Union through a package of legislation has set climate and energy targets for the 2020. The target 20-20-20 is analysed to a 20% improvement in energy efficiency, 20% in reduction of greenhouse gas emissions compared with the 1990 levels and 20% increase of the renewable energy penetration to the energy consumption.

The target was revised for the year 2030 to at least 40% reduction in greenhouse gases emission from 1990 levels, 32% share of the renewable energy and 32.5 % in energy efficiency. In the long run, European Union aims by 2050 to have an economy with almost zero greenhouse gas emissions with neutral effect to the climate. This target quantifies at 85-90% reduction of greenhouse gas emissions compared to 1990's levels.

Based on Eurostat, 33% of all the energy in the European Union is used for transport, 26% is used in the industry and 41% is used by buildings. Specifically, 80% of the energy consumed is used in small buildings of less than 1000m². Also the 2/3 of energy consumption in buildings is used for heating and cooling. (https://ec.europa.eu/energy/eu-buildings-factsheets_en)

The non-residential building stock in Cyprus comprises of 33,67% wholesale and retail trade, 21,7% for education purposes, 19,53% hotels and restaurants, 4,56% for healthcare and 20,55% for other purposes (offices etc.). This shows that the majority of buildings stock, is used by an assembly of small medium enterprises that rent or own an office space of a few hundred square meters. (https://ec.europa.eu/energy/eu-buildings-factsheets_en)

Specifically, energy is consumed in different forms throughout the building design, construction, operation and demolition.

During the design at the architects offices', computers, software, transportation for meetings etc consume different forms of energy. At the construction phase, the manufacturing of material, the heavy equipment's that work in the construction site, the transport of workers and materials, consume also energy in the form of electricity or fossil fuels. At the operation of the building assuming a lifetime of more than 50 years the most energy is consumed. This energy consumed is divided for office buildings between heating, cooling, ventilation, lighting of the building internal

or external, lifts and escalators, telecommunication and of course office equipment's such as desktop computers, printers and copy machines. The needs of hot water are minimal for offices. At the demolition phase again energy is used for the heavy machinery such as on site excavators and trucks and for the transportation of materials.

In order to reduce energy consumption during the operation of the buildings the last few years, energy efficiency and renewable energy sources were promoted through legislation on a National or European level. Such legislations are more concentrated on the energy efficiency minimum requirements and energy certification which is used to compare energy consumption between similar buildings.

Thus based on the above legislations, energy consumption in buildings can be reduced by integrating in the building structure various materials to reduce heat losses or prevent heating penetration. The individual (for each building element) and the overall heat transfer coefficient U value W/m^2K sets the lower limits regarding the selection of building materials. Based on the last National Order 121/2020 for Cyprus which be active at the 1st of July 2020, all new buildings must be at an energy performance category A. This interprets that external walls must have a U value of $0,4 W/m^2K$, horizontal structures rooftops etc a U value of $0,4 W/m^2K$, windows a U value of $2,25 W/m^2K$ and the total overall U value of the building must be below $0,65 W/m^2K$. Furthermore, the Order sets among other things shading factors, overall consumption in heating at $15kWh/m^2$ per year, light installed capacity of $10W/m^2$, automation systems required and overall energy consumption in primary energy consumed.

In order to achieve the above U values the external walls of the buildings are usually thermal insulated with materials such as extruded polystyrene, thermal bricks and rockwool. For the windows, thermal break of plastic/rubber is used between the frames and the glass is coated with special films in order to reduce heat transfer and allow sunlight penetration. The lighting fixtures as the technology advances are all led nowadays. For heating and cooling, the past years consultants avoid using boilers and use heat pumps instead which have a high coefficient of performance (COP) usually above 3,5.

Even though the above energy efficiency measures and technical solutions are very important and necessary to reduce energy consumption in buildings the cornerstone of the energy savings is the user. After all, the user is the one that consumes energy in order to heat/cool the office, turn on the light, uses or not the computer etc. Thus the overall user behaviour has the biggest part in energy consumption.

In the EU up to 2018, there were 25,1 million small medium enterprises that use buildings and offices to conduct their job and provide services. A small medium enterprise is characterized the one that employs less than 250 people. As one can easily understand small medium enterprises

are the backbone not only for EU economy but also for Cyprus. These businesses must work efficient with reduced cost, reach customers and market local and globally and at the same time, as they are the vast majority of the users of commercial buildings, must have a low carbon footprint and low energy use.

A tool in order to have a positive impact on the user's behaviour is the Energy Management System (EnMS). Energy management systems take into account all the energy related activities of the office (administration, clientele, service providing etc) that have to do with the business and employees interaction with the clients and interrelates them with the building components that consume energy . It focuses in ways to reduce this consumption through behavioural change of the users by providing training and increase of awareness and by improving the performance of the building envelope and equipment. It is a circular procedure providing feedback from the results and thus achieving the continual improvement. (Energy Institute, 2016)

The Energy Management System will help the organization to achieve its set energy tailor made targets and goals. In order to do this, the organization will have to monitor and review the EnMS, which will lead to identifying opportunities for further and continuous improvements. The most important section of an EnMS is the identification of energy consumption activities and impacts. Regarding the identification, a company should identify its operations and activities, its interaction with the clients and if any of those lead to an impact of the energy consumption.

Following the identification and impact evaluation of energy intensive activities, the next important step for an organization is setting the objectives and targets. This will help the company to quantify its actions and include them in the business strategy and transform them into energy performance goals. The objectives should be appropriate, consistent with the firm's mission, comply with any legislation requirements, taking into account stakeholders' opinion and based on the energy policy of the business. (Energy Institute, 2016)

In case an organization wants to certify its implemented Energy Management System then it has to develop the international standard of ISO 50001 and proceed with external audit.

Chapter 2

The role of Energy Management System in Small Medium Enterprises

Energy Management System (EnMS) is a set of processes, practices, policies, assessments, plans and implementation actions that enable an organization to reduce its energy consumption impacts and increase its efficiency. The aim of an EnMS is:

- 1) to prevent or reduce energy consumption impacts from the organisations activities
- 2) to help the organisation to adapt faster and comply with the energy efficiency regulations and legislations
- 3) to increase its energy efficiency
- 4) to protect the environment
- 5) to have a role in the designing of the organisations production, services and manufacturing processes taking into account the energy consumption perspective.
- 6) for the organisation to gain financial and operational benefits by applying different alternatives to reduce its energy footprint.

The successful implementation of an EnMS needs a strict commitment for the reduction of energy consumption from the management and the employees. The EnMS must be embedded into the organisations policy/strategy, decision making and be in compatibility with all other business priorities taking advantage of the raised opportunities.

The EnMS is built on total quality management concepts so that organizations focus also on why things happen. It seeks to implement the same continual improvement concepts of quality and safety practices (Quality Management Systems) into energy use, by data analysis, reviewing and targeted decisions and resources.

The plan-do-check-act model, is a continuous process that gives the opportunity for re-evaluation and continuous improvement of the organization. The “Plan” phase is where the organization plans what is going to do, set the energy consumption objectives and processes in order to achieve its targets. The “do” phase is when the organization implements what it was planned. During the “check” phase the organization monitor and verifies results and uses benchmarking to compare achieved results. Last, the identification of possible problems in the previous procedure and

recognize actions that improve the whole procedure and make the improvements is the “act” phase. (CYS EN ISO 50001:2018)

2.1 Benefits and Barriers

The Energy Management System in a small medium enterprise/organization, other than its intangible benefits, it can also create value that can be delivered at the financial statements of the company. By applying energy consumption continuous monitoring and recording along with the legal requirements, it can reduce the risk of non-conformity of the company of the legislation and it will reduce the risk of an event that can result in an energy consumption peak. Furthermore, by setting targets and objectives (i.e. electricity consumption reduction) it can also reduce the operating cost of the company that can be shown at the financial statements. (International Organization for Standardization, 2014)

In more detail the following are some of the most important benefits for implementing an EnMS:

- 1) Financial gain by savings in electricity bills and through a monitored and controllable environment, lower risk to invest in office renovation, change of equipment and office space development or rent extra space. Furthermore, monitor of preventive and corrective maintenance of the equipment keeping them in good operating condition thus reducing the capital expenditure for replacement. Another issue is that the business will be eligible and have access to better financing opportunities as more banks offer products for green or energy efficient business.
- 2) Increase in productivity due to the management follow up on energy related activities that will intervene more accurately to solve problems. This will lead to better monitoring of equipment operation, increasing the comfort levels of personnel and indoor air quality reducing the need for uncontrolled cooling and heating of offices and investment in automations. As this increases, the state of mind of the employees increases that will lead to better customer service and more productivity.
- 3) Public awareness and marketing opportunities increase as the EnMS impose to the organizations to be extrovert. This is done through the communication channels of the business reaching out to more public in order to inform them about the EnMS implementation. As public becomes more and more energy efficiency aware this will lead to an increase of customers.

On the other hand, there are also barriers for implementing an EnMS. The most important barriers in implementation is that it cost money and time and usually none of the management counterbalances the benefits of financial gain from energy savings. As energy savings are not measured directly on the financial statement, the company management usually hesitates to allocate personnel to consume time for the implementation and monitoring of such system.

Another barrier is usually the lack of customer's demand and requirement from a company to satisfy certain energy standards leading to the management to believe that an EnMS cannot add value to the company. Management usually have the notion that energy consumption issues are not a priority or even worse believe that by doing the norm is enough to achieve energy savings.

2.2 The International Standard Organisation ISO 50001:2018

In order to achieve and enhance the energy performance of buildings through the Energy Management System (EnMS) the International Organization for Standardisation published in 2011 the ISO 50001. The standard sets the processes, practices, policies, assessments, plans and implementation actions that enable an organization to reduce its energy consumption and energy footprint.

In 2018 the International Organisation for Standardisation has published an update version of the ISO50001. The document specifies the requirements to establish, implement and improve an Energy Management System. The ISO 50001 can be followed by any organisation through a systematic approach to reach its energy efficiency goals and by reviewing to achieve the continual improvement of the performance and of the business. There is also the option of external certification if a business implements' it.

The most important aspects during the implementation of an ISO50001:2018 are the following in brief:

- 1) The organisation should understand its business environment in order to identify internal and external conditions and related interested parties and stakeholders that will affect positive or negative its ability to achieve energy performance. Internal can be financial or human resources and technical knowledge and the external conditions can be energy prices or any legislation imposed.
- 2) The organisation must set the physical boundaries to implement the ISO (i.e a site, the office or the vehicle fleet) and the scope of the system which can be a process or a set of processes or all the services provided. As an example this means an organisation can implement the ISO50001 to the part of its vehicle fleet that serves the supermarket deliveries.
- 3) Leadership and management responsibility is the cornerstone of the system if the organisation truly wants to implement the system and achieve results. Top management, manager representative and energy management team must have clear distinctive roles, different level of commitments and duties.

- 4) Energy Policy is signed by the Top Management and communicated to everyone in the organisation and even outside. The top management sets the commitment to achieve energy savings and performance, to increase of energy efficiency and sets the framework for the planning and action. Energy policy must be appropriate to the size of the business it refers to and it includes among others the commitment of the management to provide resources to achieve objective and targets, the commitment to comply with legislation, the support for the purchasing of energy efficient products and to continual improve the organization's energy performance.
- 5) Energy Planning is where the organisation plans actions to assess both internal and external risks and opportunities that affect its ability to reach energy performance. Furthermore organisation must set its objectives, energy targets and the action plans to achieve them. The action plans must include the persons' responsible, what is to be done, start and finish dates and the method to evaluate the results.
- 6) Energy review describes the past and present energy use and performance, where the energy is used, the significant users of energy, identify the opportunities and set priorities for the improvement of energy performance and even estimate future energy use.
- 7) Energy Performance Indicators and Energy Baseline. During the energy planning, the company construct the energy baseline in order to have a benchmark for comparing the future energy use. Additionally, energy performance indicators are set at this stage based on certain criteria. They are suitable for monitoring and measuring the company's energy performance. They must show energy performance improvement, be able to easy monitor and measured and not be prone to changes. For example in buildings usually is used kWh/m², for vehicle fleets l/km and in industry it can be kWh/h depending on the process.
- 8) The personnel involved in the implementation and monitoring of the system should have the competence to do so. As such the management must provide the right training to the energy management team and all other personnel that make an impact on the energy performance.
- 9) Another important aspect is awareness. The management must communicate the energy policy to everyone in the organisation and all employees shall be aware of their impact and contribution to energy performance.
- 10) Communication. The organization must communicate its energy performance of the personnel and all stakeholders such as people conducting maintenance and the electricity provider. All of them, should be able to provide comments and suggestions for the improvement of the system and the energy performance.

- 11) Documentation. All important issues referred in the standard must be documented including issues important for the organisation to implement the standard. Processes should be set regarding the creation, update and control of such documents.
- 12) Operational Planning and Control. All activities regarding operation and maintenance that have direct impact on significant energy uses must be identified and controlled. Issues like operation and maintenance of equipment (air conditioning, boilers, renewables etc) and processes that have impact on energy performance (like administration, or industrial process or food preparation) must be controlled.
- 13) Design and procurement. The organisation must take into account energy efficiency during the design and procurement of new facilities or renovation of existing, any new service provision, new processes and the purchasing of equipment.
- 14) Monitoring, measurement, analysis and evaluation of energy performance. The organisation must set a regular programme in order to monitor, measure and analyse the energy performance, the energy performance indicators, the operation of significant energy users and the comparison of the actual energy consumption versus the expected consumed that is derived through the energy baseline.
- 15) Evaluation of compliance with legal requirement. At set intervals the organisation shall check its compliance with legal requirements that have to do with energy performance and energy savings.
- 16) Internal Audit. The organisation should carry out audit of the system in frequent set intervals in order to evaluate the performance of the standard its improvement and if it's well implemented. The audit is conducted by a third competent party inside or outside the organisation in order to be impartial with the implementation and not directly connected to the system. Any non-conformities found should be documented, addressed and take corrective or meditative actions in order to achieve continual improvement of the system.
- 17) Management review. The standard requires that in set intervals a management review should be conducted with certain input and outputs. It is basically an annual report which includes results and achievements of the period and promotes continuity of the system. Moreover, management review is the Top Management's opportunity to give feedback and change the system in order to support the organization to achieve its' objectives and targets. In more detail, a meeting is conducted in order for the top management to be presented with system documents and the achieved savings. This periodic review of the system by the management and the identification of the need to change and improve leads to a continuous improvement of the system.

2.3 Methodology

Energy Management constitutes one of the main areas of sustainable energy practices. Especially in the building sector, energy management constitutes a significant operation which may assist an organisation to reduce the required sources, financial and natural, to satisfy its needs.

The purpose of the study is to develop the energy management system of ISO50001:2018 for a small medium enterprise and analyse its energy use and its energy performance. The application concerns the offices of the organisation. Consumption patterns are derived and good energy management practices were defined and monetised by means of simple payback period.

The small medium enterprise will be provided with an applied model of processes for the design, implementation and continuous improvement of an energy management system based on the ISO50001:2018.

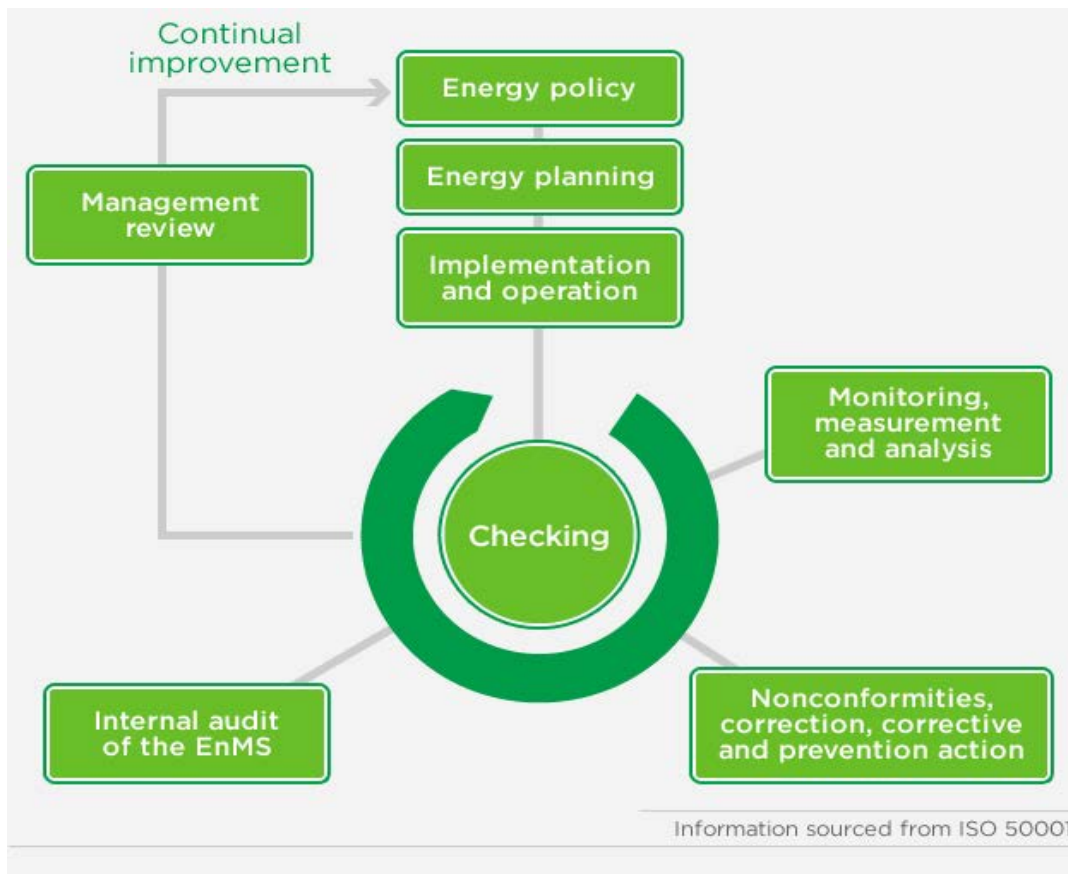


Figure 1. Operating principle of the ISO Standards.

During the design and creation of the energy management system CYS EN ISO 50001:2018 the following aspects of the enterprise were taken into consideration:

- ✓ Customer requirements and needs that may affect energy performance
- ✓ The laws, regulations and standards that must be satisfied by the company
- ✓ Energy consumption impacts from the operation of the organisation.

For the development of the system, an energy policy was formed, job descriptions were defined, a procedures manual was prepared and past and present energy data were collected and analysed. A synoptic energy audit of the organisation was conducted in order to define all needed for the energy review. Moreover, the energy baseline was constructed, energy performance indicators were identified and objectives and targets were set. The legal requirements and appropriate legislation was identified and recorded.

Internal Audit and Management Review were not conducted as the system should be fully developed, implemented and applied for a period of time in order for an internal audition and management review to be performed.

Lastly, a financial performance of the proposed measures and an assessment of the effectiveness of the proposed measures was conducted and methods for further improving the performance of the selected objectives were defined.

Chapter 3

Organization and its context

The company Stelios Americanos & Co LLC has applied the model of business processes for the design, implementation and continuous improvement of an energy management system.

During the design and creation of the energy management system the following were taken into consideration, as mentioned in the methodology above:

- 1) Customer requirements and needs that may affect company's energy performance
- 2) The requirements of the standard CYS EN ISO 50001:2018
- 3) The laws, regulations and standards on energy performance
- 4) Energy impacts from the operations of the law firm.

The energy management system operates through a set of procedures that were derived from specific targets. The operating system is evaluated through internal and external audits, corrective actions and all information recorded by the system.

3.1 Scope of the EnMS

The scope of the EnMS covers all local office activities of the law firm that include provision of legal advices/services/ consultancy to local and foreign companies and persons and include the following office operations on:

- ✓ Corporate & Commercial Law
- ✓ Banking & Finance
- ✓ Litigation & Arbitration
- ✓ Real Estate & Construction
- ✓ Intellectual Property
- ✓ Ship Registration & Finance
- ✓ International Tax Planning
- ✓ Financial Services
- ✓ Accounting
- ✓ Corporate & Fiduciary Services
- ✓ Global Company Formation & Corporate Management
- ✓ Energy & Natural Resources

3.2 Boundaries of the system

The EnMS will be implemented at the main offices of the legal firm at Demostheni Severi Street Building no 12. The offices of the firm is located at the 6th floor at office number 602. The office floor plan marked with yellow colour in Appendix A defines the physical boundaries of the system that includes all operations of the office.

3.3 Description of the Company

Stelios Americanos & Co LLC is a law firm established in January 2010, with its headquarters situated at the 6th floor at 12 Demostheni Severi Street, Nicosia (since May 2015) and a branch in Athens, Greece and recently in Israel.

Its mission as in its website is “to provide high quality legal services with integrity, professionalism and respect towards the clients, their colleagues and the law.”

It procures legal services and consults on areas involving administrative and public law, energy, property and construction, competition law, public procurement and tenders, tax services etc. It specializes in corporate, commercial and banking law, focusing mainly on transboundary banking financing, joint ventures, mergers and acquisitions.

Stelios Americanos & Co LLC has strong legal experience and advises clients on banking and financial disputes, registration and execution of judgements and arbitral awards and ensures intermediate remedies and all kinds of interim orders regarding disputes between shareholders, creditors, enforcement of charges and fraud cases.(www.americanoslaw.com)

Nowadays, the law firm is one of the leading firms in Cyprus in the above areas. The clients are guaranteed continuous and tailored-made support along with a positive and constructive approach and an ability to solve legal and tax problems in a business oriented mentality.

The firm provides services to multinational corporations, international financial companies, public companies of the Cyprus Stock Exchange, governmental and semi-governmental organizations and banks in matters related to mergers and acquisitions, securitization, finance, restructuring and litigation. (www.americanoslaw.com)

A non-exhaustive list of international clientele, includes major financial-banking institutions, investment funds and leading international law firms, as indicated below:

- ✓ Alfa Bank Ukraine,
- ✓ Oil Company Alliance,
- ✓ Amsterdam Trade Bank,
- ✓ Bank of Moscow,

- ✓ Bank Saint Petersburg,
- ✓ China Development Bank,
- ✓ Deutsche Bank,
- ✓ Heitman Real Estate Investment Management Firm,
- ✓ ING,
- ✓ IFC World Bank Group,
- ✓ MEKOROT Israel National Water Co.,
- ✓ Qatar Airways,
- ✓ Eurobank,
- ✓ Piraeus Bank.

The firm is a member of several professional associations such as International Bar Association, Cyprus Bar Association, International Tax Planning Association and Society of Trust and Estate Practitioners. (www.americanoslaw.com)

3.4 Description of Offices

Since 2015, the law firm, despite the difficult economic conditions the whole country was facing, has moved to new office premises at Demosthenes Severi Street. The floor plan includes lawyer’s offices, meeting rooms, storage and fax/copy machine room, small kitchen and toilets. For cooling and heating of the space a variable refrigerant flow air conditioning system is used. For lighting there are led ceiling recessed lighting fixtures and led spotlights at the corridors. Each office has the basic office equipment of a computer, a screen, a printer and a telephone.

3.5 Organizational Structure

The firm employs 26 persons. Four persons are the partners of the law firm and are considered as the management team. Mr. Stelios Amerikanos is the managing partner. It also has three lawyers as seniors’ associates and 7 as associates. The corporate department is consisted by 7 persons and the accounting department by another 3. There are 4 secretaries and 1 cleaning lady. The organizational chart is as follows.

MANAGING PARTNER	COURT	LEGAL	CORPORATE	ACCOUNTING DEPARTMENT	SECRETARY
STELIOS AMERICANOS	HEAD: SOTERIS COSTA	HEAD: DESPINA AMERICANOU	HEAD: JULIANA KYRIAKIDES	HEAD: MIRANDA SYMEOU	MARIA SYMEONIDOU
	MORFAKIS KOUMAS	MICHALIS ZAMPYRIDES	HELEN PANTELI	STELLA MITSINGA	EUTHIMIA EUTHIMIOU
	THANOS FKIAKAS	KYRIAKI CHRISTOFI	ANDRI MANDI	MARY SKOUROU	STYLIANA DEMETRIOU
	CHRYSANTHI EPIFANIOU	XENIA KALOGIROU	KATERINA EFTHIVOULOU		EIRINI EVRIVIADOU

	CHRISTOFOROS TSEKOURAS		NICOLETTA SAVVA		
	ANDREAS PARPAS		AGATA KOLONKA		
			KARINA STOLBOVSKIKH		
CLEANING	MARIA NIROVA				

Table 1. Organizational Structure of Stelios Americanos & Co LLC

3.6 Understanding the organization and its context

Stelios Americanos & Co LLC Company recognizes internal and external issues that affect its activities and influence its ability to achieve the desired results from the EnMS. These issues include, among others:

1) Internal issues:

- ✓ Culture of employees and associates
- ✓ The various tasks and activities carried out within the company as well as all indirect and direct actions affecting energy objectives and impacts
- ✓ Infrastructure and equipment
- ✓ Personnel knowledge regarding energy performance
- ✓ Other

2) External issues:

- ✓ Legislative requirements (International, European, National, Local)
- ✓ Requirements from interested parties (e.g. Clients, Associates, Cyprus BAR Association, Employees, Municipality of Nicosia, suppliers of products and services)
- ✓ The surrounding area of the office (natural environment, building)
- ✓ Cultural, social, political, regulatory, economic, technological, physical and competitive conditions at international , national and local level
- ✓ Energy performance conditions that are influenced by the company or are capable of affecting the company's operation
- ✓ Other

All above issues are managed through the EnMS, from where risks and opportunities arise for the business.

Culture of employees	Employees of the firm are aware of the energy management issues and promote the implementation of EnMS. They are constantly updated and training from the management on different EnMS issues is planned
Culture of associates	The associates of the Company are aware of energy management issues and they expect the firm to implement the EnMS
The various tasks and activities carried out within the company as well as all indirect and direct energy impacts	No significant energy aspects arise, other from the operation of the firm as the business offers legal services only to Cypriot and non-Cypriot clients
Infrastructure	The offices are located in the center of Nicosia at the top floor of a Building in Demostheni Severi Street. It is a modern building covering the minimum standards of the energy efficiency legislation at the year it was licensed.
Equipment	The equipment used for the operation of the company are computers, telephone system, printers, copy machines, air conditioners, air handling units, lighting fixtures and IT servers.

Table 2. Internal Issues

Legislative requirements (International, National, Local)	Due to the nature of the company's operations and the location of its offices, they do not have specific energy related legislation to follow except the ones that relate with air conditioning maintenance and handling of HFC gas. Overall, they have to comply with the legislation requirements regarding energy performance if a full scale renovation is conducted.
Requirements from interested parties (e.g. Customers, Associates, Cyprus Association, employees,	All stakeholders' requirements related to the firm compliance with energy performance issues are also taken into account

Municipality of Nicosia, suppliers of products and services)	
Cultural, social, political, regulatory, economic, technological, physical and competitive conditions at international, community, national and local level	The Company's operations and offices have no direct significant impact on any of those aspects

Table 3. External Issues

3.7 Understanding the needs and expectations of interested parties

The needs and expectations of the company's stakeholders are presented in the Table below. Their requirements which are a commitment to the company are presented and analysed in the various chapters of the Energy Management System.

Interested parties	Needs / Expectations	Ways to identify needs and expectations
Shareholders / Partners	<ul style="list-style-type: none"> ✓ Compliance with applicable laws and regulations concerning business and environment and energy ✓ Compliance with clients' requirements 	<ul style="list-style-type: none"> ✓ Management reviews ✓ Through meetings ✓ Suggestions and comments
Employees	<ul style="list-style-type: none"> ✓ Good wages ✓ Provision of training ✓ Good working environment, comfort conditions ✓ Provision of user friendly equipment 	<ul style="list-style-type: none"> ✓ Through meetings and discussions ✓ Suggestions and comments

	<ul style="list-style-type: none"> ✓ Provision of energy efficient offices and equipment 	
Clientele	<ul style="list-style-type: none"> ✓ Compliance with their requirements ✓ Timely serviced 	<ul style="list-style-type: none"> ✓ Contract Application ✓ Through meetings
Co-operators / Associates	<ul style="list-style-type: none"> ✓ Immediate Service ✓ Good Co operation 	<ul style="list-style-type: none"> ✓ Through meetings and discussions
Cyprus BAR Association	<ul style="list-style-type: none"> ✓ Compliance with applicable laws and regulations ✓ Compliance with BAR regulations 	<ul style="list-style-type: none"> ✓ BAR Circulars ✓ Through meetings
Suppliers of products and services	<ul style="list-style-type: none"> ✓ Information on the requirements set by the company for the supply of products and services by subcontractors ✓ Timely programming of supplies. 	<ul style="list-style-type: none"> ✓ Contract Application ✓ Through Meetings
Municipality of Nicosia	<ul style="list-style-type: none"> ✓ Compliance with applicable laws and regulations 	<ul style="list-style-type: none"> ✓ Through letters and information provided by the Municipality and good practices
Building management committee	<ul style="list-style-type: none"> ✓ Compliance with the requirements for proper use, cleanliness and maintenance of the building ✓ Payment of common charges 	<ul style="list-style-type: none"> ✓ Contract Application ✓ Through Meetings
Department of Energy Service	<ul style="list-style-type: none"> ✓ Compliance with applicable laws and regulations 	<ul style="list-style-type: none"> ✓ Departments' circulars and website

Table 4. Needs and expectations of interested parties

3.8 Leadership Management Responsibility

For the better functioning of the energy management system, specific responsibilities and duties have been assigned to the firm's staff. The Top Manager Mr. Stelios Amerikanos has appointed

Mrs. Despina Americanou as Management Representative and Mrs. Miranda Symeou to act as an Energy Management Team.

The duties and responsibilities for each level of management are described below.

3.8.1 Top Management

The duties of the Top Management Mr. Stelios Americanos are described below:

- ✓ Defines and establishes the scope and the boundaries of the system.
- ✓ Defines, establishes, implements and maintain the company's energy policy
- ✓ It provides appropriate and necessary resources for the effective implementation of the energy management system
- ✓ Appoints the management representative and the formation of the energy management team
- ✓ Is informed by the Management Representative of the effective implementation of the energy management system
- ✓ It defines, evaluates and reviews energy targets and objectives and that they align with organization's strategy.
- ✓ Ensures that Energy Performance Indicators represents the organizations energy performance
- ✓ Is informed of energy performance problems or any complaints that may arise and resolve them in cooperation with the Management Representative
- ✓ Ensures continual improvement of the Energy Management System

3.8.2 Management Representative

The Management's Representative (Mrs. Despoina Americanou) is appointed by the Managing Partner of the firm Mr. Stelios Americanos. The duties and responsibilities of the Management's Representative are described below:

- ✓ Selection, training and guidance of the Energy Management Team.
- ✓ Coordination of the activities of the Energy Management Team.
- ✓ Recognizing, notifying and finding the resources needed to implement energy management activities.
- ✓ Collaboration with the Top Management for planning and information purposes.
- ✓ Organizing energy education trainings for the personnel.

- ✓ Involvement in the writing of the Energy Policy and other documents of the Energy Management System.
- ✓ Participation in Management Reviews.
- ✓ Providing information on strategic energy management planning and decision-making.
- ✓ Ensure the performance of energy data monitoring, collection and confirmation activities.
- ✓ Ensure calibration of measuring instruments.
- ✓ Supervision of the Internal Audit program.
- ✓ Assessment of the training needs in Energy Management System issues.
- ✓ Managing Non-Compliances and Corrective Actions.
- ✓ Providing energy information to the Top Management for planning and administrative purposes.
- ✓ Approves the proposed changes to the procedures concerning the system.

3.8.3 Energy Management Team

The Energy Management Team (Mrs. Myranda Symeou) is appointed via email by the Managing Partner, after consulting the Management Representative. The tasks , duties and responsibilities of the individuals in the Energy Management Team are described below:

- ✓ Implementation of the Energy Policy and the objectives of the Firm.
- ✓ Writing/updating the Energy Management Manual and the Energy Management System Procedures.
- ✓ Determining the energy profile.
- ✓ Energy data collection and evaluation.
- ✓ Creation of educational material on energy management issues.
- ✓ Assuring the procurement of Internal Audits, recording of Non-Compliances and Corrective Actions.
- ✓ Develop activities to ensure the implementation of the Organisation's Energy Policy and the implementation of its objectives.
- ✓ Ensures that processes necessary for the EnMS are established, implemented and maintained
- ✓ Informs the Management Representative for the performance of the system and for its needs to improve
- ✓ Schedules the management review meetings
- ✓ Schedules the internal audits and informs all involved staff

- ✓ Enables external system audits in collaboration with the certification company
- ✓ It performs all the responsibilities and tasks resulting from the implementation of the system.
- ✓ Suggest changes and modifications to the system where required.
- ✓ It is responsible for identifying training needs for staff.
- ✓ It is responsible for monitoring energy legislation and taking the necessary action to comply with the law.
- ✓ Records the various evidence supporting the implementation of the energy management system.
- ✓ Responsible on any other tasks assigned by the management representative and related to its' work.
- ✓ Ensures that personnel closely follow the firm's energy management regulations and related legislation.
- ✓ Suggests to the Management Representative services concerning the implementation of the system to be provided by external service providers.

3.9 Risk and Opportunities

The Energy Management Team identifies the risks and opportunities regarding the system. Potential risks of the system is the decrease of thermal comfort and air quality in the office space, reduction of the lighting quality that will decrease productivity of the personnel. Another risk is the potential increase of nuisance in the buildings' users in case of any maintenance or installation of equipment that can even create health and safety issues among users. Another risk is the lack of technical knowledge among personnel that will create difficulties in the implementation of the EnMS.

The opportunities that arise is the improvement of the above such as air quality, air temperature, comfort and natural light conditions in order to increase productivity and satisfaction among employees. Last opportunity arises at the training of personnel to create the culture of energy performance and savings.

Chapter 4

Energy Policy

Stelios Americanos & Co LLC through its energy policy aims to ensure its commitment to conducting all its business activities responsibly with due regard to energy performance and energy consumption, carbon footprint reduction and sustainable performance.

The management of the firm in order to achieve its goals is committed to the following:

- ✓ Maintain and improve on an ongoing basis the energy management system in accordance with the requirements of the standard ISO 50001. The system must always reflect the changing conditions and the new data.
- ✓ Provide the resources and information needed to achieve its energy targets and objectives.
- ✓ Identify energy objectives, sets energy consumption goals/targets, monitor results and audit processes in order to assess its performance against internal and external energy standards
- ✓ Includes energy reduction strategies and objectives in its business planning processes and business strategy to ensure that management of energy consumption remains an integral part of the operations
- ✓ Encouraging good energy use practices within the organization and among the personnel
- ✓ Continuous efforts to adopt options that minimize its carbon footprint, help protect the environment, save energy and increase performance.
- ✓ Define energy management targets, the achievement of which is reviewed at regular intervals through the management review in order to ensure continuity.
- ✓ Obey all applicable laws and regulations relating to energy efficiency.
- ✓ Setting criteria for the purchase of energy efficient products and services.
- ✓ Training of personnel through outsourcing and internal communication

This policy is implemented for all our activities. With this policy statement, we are committed for the continual improvement of the effectiveness of our Energy Management System through the systematic monitoring of its performance and the implementation of the necessary improvement actions. The policy and the objectives are reviewed during structured management reviews at

least once a year in order to ensure their continuing suitability. It is also communicated to all local and international personnel of Stelios Americanos & Co LLC and is made available to the partners and associates.

Stelios Americanos

Managing Partner

Chapter 5

Energy Planning and Review

The responsibility of conducting the energy plan and its calculations lies upon the Energy Management Team and any external outsourcing the Team hires for that purpose.

5.1 Purpose of the Energy Plan and Review

The purpose of the Energy Plan, which results from the application of the described Energy Plan Manual described in the following Chapters, is to:

- 1) List the existing sources of energy consumed by the firm.
- 2) Record how the above energy sources are consumed.
- 3) Record the technical characteristics of electromechanical equipment, lighting, hot water, office equipment, etc.
- 4) Record the process of collecting and analysing energy data.
- 5) Assign tasks for data collection, collection frequency and data archiving.
- 6) Identify the most significant energy uses.
- 7) Develop the Energy Balance and Energy Baseline.
- 8) Identify and prioritize potential energy investments.
- 9) Formulate the energy objectives and objectives of the Firm and develop Action Plans to achieve them.

5.2 Legal and other requirements

The organization identifies and records the legal and other obligations which concern energy use, energy consumption and energy efficiency. These obligations are taken into account during the development, implementation and implementation of the Energy Management System.

The above information is recorded by using various websites i.e of the Energy Service Department and the Department of Environment and archived and revised once a year by the Energy Management Team using the form in Appendix B.

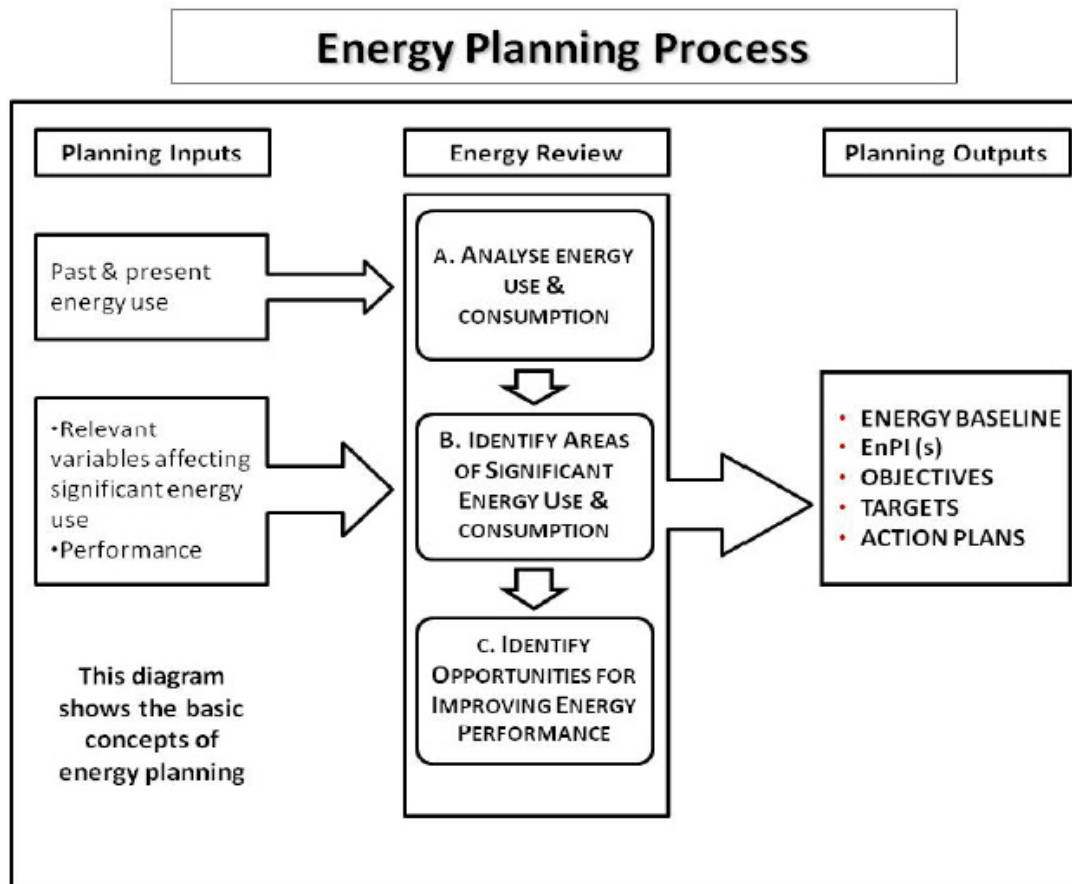


Figure 2. The process of energy planning. Source ISO50001:2018

5.3 Energy Sources and Use of Energy

The organization identifies the energy sources and energy uses that arise within the physical boundaries of office 602 at the 6th floor. In this case, the only source of energy is electricity.

5.3.1 Heating and Cooling

The space heating and cooling of the offices is conducted through a variable refrigerant flow (VRF) system with indoor units. There is also a heat recovery system (HRV) system for all offices with direct expansion (DX) coil (connected with the VRV) for ventilation purposes. For the server's room there are two split units wall type installed. All systems run on electricity which is the only type of energy consumed on the premises.

Specifically, heating and cooling of the office area is conducted through 3 outdoor inverter units of variable refrigerant flow (VRF) system of cooling capacity of 45 kW, 28 kW and 14 kW respectively. The offices and common spaces are using indoor units of ceiling concealed types (ducted) mostly with a capacity of 4,5kW. The following table shows the outdoor and indoor air-conditioning equipment, its cooling capacity and its input power.



Figure 3. Photos of the installed variable refrigerant flow units and air conditioning on the rooftop

VRV SYSTEM - DAIKIN						
NEW REF	TYPE	MODEL	CAPACITY	POWER	RUNNING	STARTING
			(KW)	INPUT	CURRENT	CURRENT
				(KW)	(A)	(A)
O.U. 6.1	HEATPUMP	RXYQ16T	45	13	21,3	85
I.U. 6.1.1	CEILING CONCEALED	FXSQ63P9	7,1	0,074	1,1	
I.U. 6.1.2	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.3	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.4	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.5	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.6	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.7	CEILING CONCEALED	FXSQ63P9	7,1	0,074	1,1	
I.U. 6.1.8	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.9	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.10	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.11	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
O.U. 6.2	HEATPUMP	RXYQ10T	28	7,29	11,3	74
I.U. 6.2.1	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.2.2	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.2.3	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.2.4	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.2.5	CEILING CONCEALED	FXSQ50P9	5,6	0,097	1,2	
I.U. 6.2.6	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	

O.U. 6.3	HEATPUMP	RXYQ5P9	14	3,52	5,1	7,79
I.U. 6.3.1	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.3.2	CEILING CONCEALED	FXSQ40P9	4,5	0,053		
I.U. 6.3.3	CEILING CONCEALED	FXSQ40P9	4,5	0,053		
I.U. 6.3.4	CEILING CONCEALED	FXSQ40P9	4,5	0,053		
SPLIT UNITS DAIKIN						
NEW REF	TYPE	MODEL	CAPACITY	POWER	RUNNING	STARTING
			(KW)	INPUT	CURRENT	CURRENT
				(KW)	(A)	(A)
S.U. Server 1	WALL TYPE	FTX25JV/RX25JV	2,5	0,44	1,83	Inverter
S.U. Server 2	WALL TYPE	FTX25JV/RX25JV	2,5	0,44	1,83	Inverter

Table 5. List of the variable refrigerant flow (VRF) equipment and indoor units

The ventilation of the office is conducted through a heat reclaim ventilation system with a direct expansion coil connected to the VRF system. The input power of the systems are shown at the table below.

REF	TYPE	MODEL	EFFICIENCY (Lt/s - Pa)			POWER
			LOW SPD	HIGH SPD	ULTRA HIGH SPD	INPUT (KW)
HRV 6.1	DAIKIN	VAM1000FB			280-157	0,38
HRV 6.2	DAIKIN	VAM1000FB			280-157	0,38
HRV 6.3	DAIKIN	VAM500FB			140-98	0,18

Table 6. List of the heat recovery units for ventilation purposes.

5.3.2 Lighting fixtures

The lightings fixtures of the office are mainly linear led strips ceiling suspended fixtures of 50 W each. Two linear ceiling suspended led lights are installed in each office (also at the kitchen, reception, meeting rooms, archive room) up to a total number of 54 lighting fixtures. At the common space, corridors, rest rooms etc there are spotlights with double or single led lights of 12W each. The installed number of spotlights led is total 82 units.

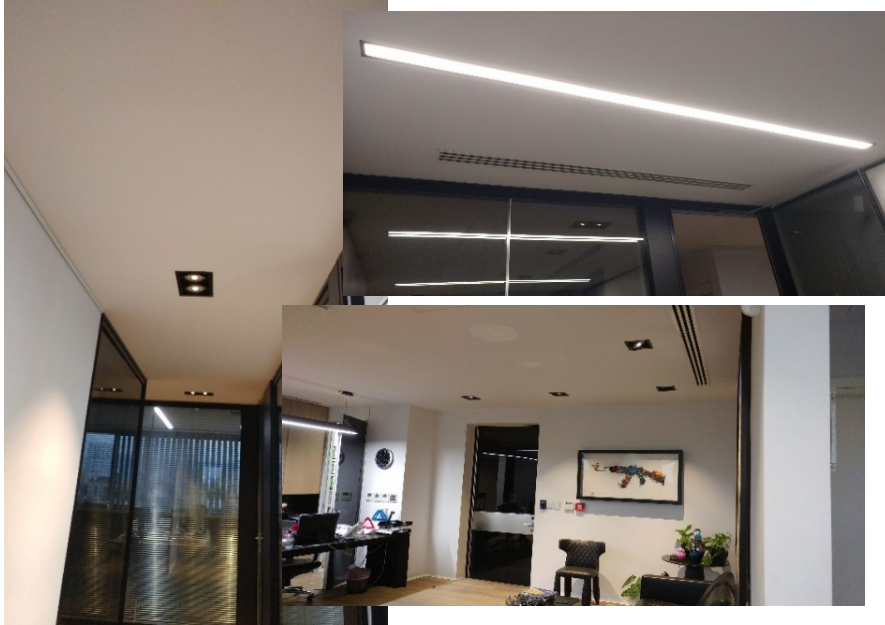


Figure 4 Photos of the installed led lighting

5.3.3 Office equipment

The office has also other equipment that consume electricity. There are 26 desktop computers with screens and printers. There two copy machines. There is also kitchen with a refrigerator, a microwave, a dishwasher and two coffee machines. The access to the server was not allowed.



Figure 5 Photos of other equipment (computers, kitchenette etc)

Desktop and personal computers power input was estimated at 300 W, servers at 600 W and printers at 150W. The toilet ventilation was estimated at 30W each (4 toilet fans) and a 2,2 kW water heater per toilet. The kitchen equipment such as refrigerator, dish washer, coffee machine was estimated at 1,5 kW. More details can be found at the energy balance tale below.

5.4 Data Collection and Analysis of Past and Present Energy Use

The electricity is consumed mainly for the cooling and heating of the offices through outdoor variable refrigerant flow units (VRF) and indoor units for each office. Secondly, electricity consumption also comes from the lighting fixtures of the offices. Last but not least, office equipment such as desktop computers, printers, scanners and photocopy machines are equally a major electricity consumption.

The company has proceeded with the identification and recording of the operations and activities of the business that consume the most. In particular, electricity consumption includes activities such as the operation of offices, administration, management and client service.

The electricity consumption data were collected from the Energy Management Team Mrs. Miranda Simeou (Accounting Department), through bimonthly electricity bills of the Electricity Authority of Cyprus. The data are from the period of 28/5/2015 up to 27/1/2020 and are presented at the table below.

Start Date	End Date	Cost of Electricity	Consumption kWh	Net Working Days excluding holidays	Consumption per working day in kWh
28/5/2015	23/7/2015	1.390,86 €	7621	40	191
24/7/2015	23/9/2015	1.458,28 €	7266	44	165
24/9/2015	24/11/2015	679,32 €	3636	42	87
25/11/2015	27/1/2016	1.090,71 €	6185	42	147
28/1/2016	24/3/2016	974,85 €	6068	40	152
25/3/2016	26/5/2016	729,59 €	4741	40	119
27/5/2016	25/7/2016	1.293,62 €	8321	41	203
26/7/2016	23/9/2016	1.471,02 €	8631	43	201
24/9/2016	23/11/2016	868,15 €	4968	42	118

24/11/2016	25/1/2017	1.406,89 €	7785	42	185
26/1/2017	23/3/2017	1.286,32 €	6308	40	158
24/3/2017	24/5/2017	1.072,08 €	5396	40	135
25/5/2017	25/7/2017	1.633,92 €	8496	43	198
26/7/2017	25/9/2017	1.851,96 €	9686	43	225
26/9/2017	23/11/2017	975,56 €	5490	43	128
24/11/2017	24/1/2018	1.232,74 €	6890	40	172
25/1/2018	22/3/2018	835,83 €	4505	40	113
23/3/2018	23/5/2018	1.279,59 €	6744	40	169
24/5/2018	23/7/2018	1.423,97 €	7163	42	171
24/7/2018	24/9/2018	2.018,53 €	9182	44	209
25/9/2018	22/11/2018	1.248,06 €	5480	42	130
23/11/2018	23/1/2019	1.644,97 €	7116	39	182
24/1/2019	27/3/2019	1.085,71 €	5159	43	120
28/3/2019	24/5/2019	1.099,95 €	5255	37	142
25/5/2019	23/7/2019	1.740,21 €	7874	41	192
24/7/2019	24/9/2019	1.787,85 €	8307	44	189
25/9/2019	25/11/2019	1.144,72 €	5044	43	117
26/11/2019	27/1/2020	1.562,62 €	6981	40	175
	Total	36.287,88 €	186298	1160	

Table 7. Electricity Bills Data from 28/5/2015-27/1/2020

Based on the electricity bills the analysis below was conducted and presented at the following table. Some important data is the average cost of electricity which is estimated through the bills at 0,195 Euro per kWh. Electricity tariff is the commercial tariff number 15. The average consumption of electricity per working day is 161kWh with an average cost per day at 31,40 Euros. The average consumption per employee/working day is 6,2 kWh.

Useful Data Analysis of electricity consumed		
Total consumption from 28/5/2015-27/1/2020	186298	kWh
Total cost of electricity from 28/5/2015-27/1/2020	36.287,88	€
<i>Average consumption per year</i>	<i>40400</i>	<i>kWh</i>
<i>Average cost per year</i>	<i>7900</i>	<i>€</i>
<i>Average cost per kWh</i>	<i>0,195</i>	<i>€</i>
Average consumption per working day	161	kWh
Average electricity cost per day	31,30	€
Average Consumption/employee/ working day	6,2	kWh
Average cost in electricity per employee/day	1,20	€
Base load Electricity Bimonthly Consumed approx.	4900	kWh

Table 8. Key electricity consumption numbers derived from the analysis

At the absence of individual metering for heating/ cooling, office equipment and lighting consumption we can conduct the following analysis and have some useful conclusions. At the following graph it is presented schematically the electricity consumption per year from 2015. The year 2017 seems to be the most energy intensive year coming to a peak at the 4th bimonthly period of July and August where the air conditioning is working intensively. All the year's peak their consumption during summer time as air conditioning is working at peak load. During April -May and October- November we have the lowest consumption as no heating and cooling is needed due to mild weather conditions.

During the weather neutrality period of April /May and October/ November where heating and cooling is not necessary needed, we can check and predict the base load of the office. During those two above mentioned periods the consumption is around 4900 kWh. This means that all other electricity consumption (excluding the cooling and heating as are not so intensively used in that period) equipment as the lighting, ventilation, computers and other equipment such as refrigerators, computers, servers are responsible for consuming around the 85% of the 4900 kWh. The percentage of 85% was used (assumption) because some of air conditioning is used during May and also some heating is used during November.

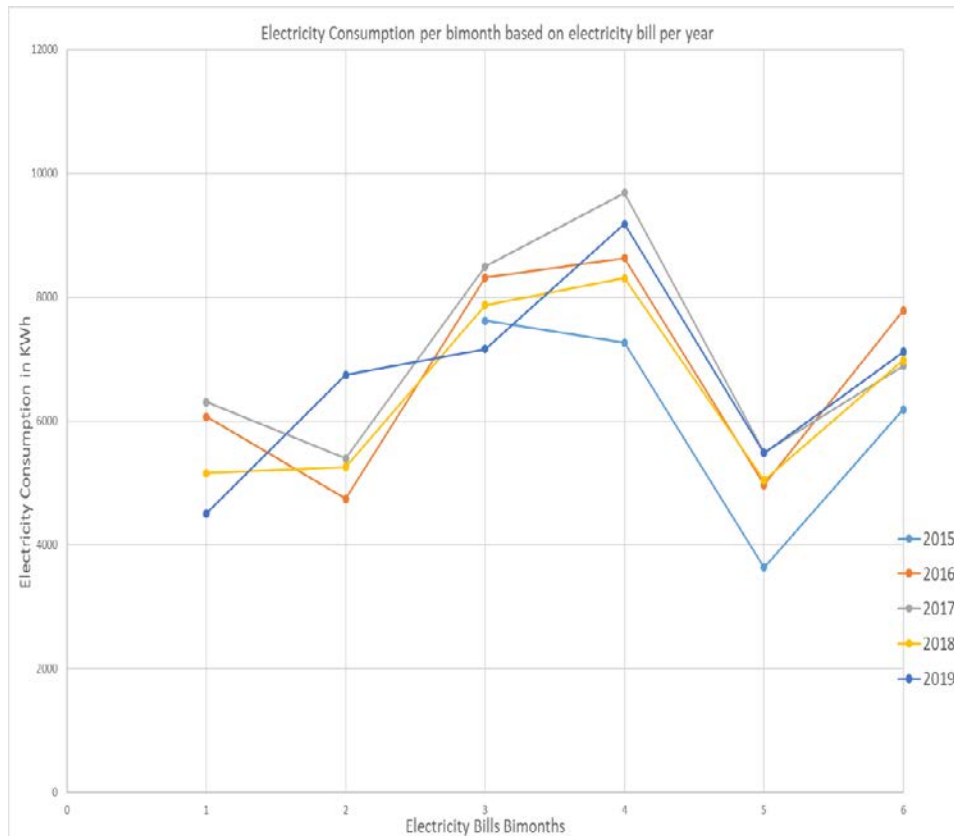


Figure 6. Electricity consumption per year presented in 6 bimonthly period starting from end of January

Thus around 4165kWh per bimonthly are consumed from other equipment than VRF for heating and cooling. At an average of 42 working days per bimonthly this means that $4165/42=99$ kWh per day. At an average consumption of 161 kWh per day the base load is the 99 kWh, thus the $99/161\approx 60\%$.

The above calculation leads us to the conclusion that heating and cooling is responsible for 40% of total year consumption meaning of 16150kWh and with a cost of 3150 euros per year.

The variables affecting the energy consumption are outside office occupancy, weather temperature, the operating hours of the equipment and the capacity installed of each equipment.

5.5 Energy review

5.5.1 Analysis per individual equipment

Based on the above assumptions, all other equipment along with lighting consume 99kWh per day thus 24240 kWh per year and total of 4750 euros per year. Furthermore, in the absence of individual metering and analysis per equipment, a further calculation was conducted in order to assume the consumption percentage of each energy intensive equipment and it is presented in the following table.

Electricity Consumption Equipment	Quantity	Capacity (kW)	Total Capacity (kW)	Available operation hours per annum (hrs)	Load Factor (%)	Percentage of hours operation (operation coefficient) (%)	Estimated yearly consumption (kWh/yr)	% of the total consumption	Total Cost per year
Central VRF System							11954	30%	2.331 €
- Total Outdoor of 3 Units	1	23,810	23,81	2016	33%	70%	11088	28%	
- Total Indoor Units	1	1,859	1,86	2016	33%	70%	866	2%	
Split Units and Ventilation							4292	11%	837 €
- Server room	2	0,440	0,88	8760	50%	100%	3854	10%	
- Ventilation	1	2,000	0,94	2016	33%	70%	438	1%	
Lighting							6684	17%	1.303 €
- Recessed LED linear	54	0,050	2,70	2016	100%	90%	4899	12%	
- Recessed LED spotlights	82	0,012	0,98	2016	100%	90%	1785	4%	
Cold and hot water installations							1008	3%	197 €
- Water pressure pump	1	0,600	0,60	2016	100%	10%	121	0%	
- Water heater Rest room 1	1	2,200	2,20	2016	100%	10%	444	1%	
- Water heater Rest room 2	1	2,200	2,20	2016	100%	10%	444	1%	
Office equipment							13721	34%	2.676 €
- DESKTOP	26	0,300	7,80	2016	75%	90%	10614	26%	
- SERVER	2	0,600	1,20	2016	75%	130%	2359	6%	
- PRINTER	26	0,150	3,90	2016	75%	10%	590	1%	
- COPY MACHINE	2	0,500	1,00	2016	75%	10%	151	0%	
- FAX MACHINE	1	0,050	0,05	2016	75%	10%	8	0%	
Others							2652	7%	517 €
- Toilet Ventilation	2	0,030	0,06	2016	100%	10%	12	0%	
- Toilet Ventilation 2	2	0,030	0,06	2016	100%	10%	12	0%	
- Refrigerator/ Coffee Machine/ Dishwasher etc	1	1,500	1,50	8760	50%	40%	2628	7%	
total							40312	100%	7.861 €

Table 9. Analysis of the energy use per equipment

For each equipment a load factor was assumed. For cooling and heating the load factor was assumed at 33% because as the units are inverters they are not working at their full capacity but depend on demand. Lighting, hot water installations it was assumed at a loading factor at 100%. Office equipment is considered at a loading factor depending on demand at 75%.

Furthermore, an operation hours' factor was assumed for each and every one equipment that corresponds to the time where the equipment is in use. It represents the time that each equipment operates. The office working hours are calculated to be around 2016 hours per year. As such, lighting is assumed to work at 90% of the office working hours, the heating and air-conditioning operate at 70% of office working hours, desktop at 90%, printers/fax machines/copy machines at 10%. Also ventilation at the rest room are considered working 10% of the office hours. For the servers the operation time was assumed 130% more than the 2016 office hours because they operate long after the closing hours for back up purposes and serving email.

5.6 Identified Areas of Significant Energy Use

Based on the above analysis and calculations the conclusions are that heating/cooling is responsible for the 30% of the total year consumption and another 10% is the ventilation along with the server split units. Lighting is responsible for the 17% and office equipment at around 34-35%. Other equipment such as toilet ventilation and kitchen equipment accounts at 7%. The total cost of the above calculation is around 7861 Euros and a total consumption of 40312 which is approximately the same as the total consumption based on the four-year consumption average.

The following graph summarizes the conclusions.

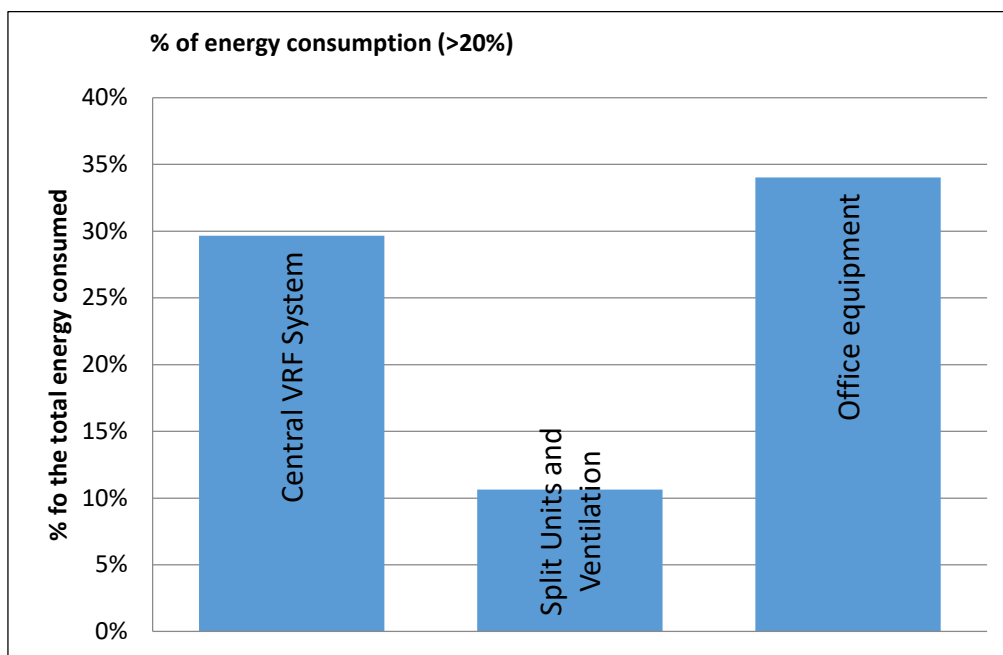


Figure 7. Significant Energy Uses . Percentage of total consumption per equipemnt

5.7 Identified Opportunities for Improvement

The action plan for the energy saving measures that will be implemented the next few years to achieve the energy objectives and targets was formulated by taking into account the results of the energy audit carried out at the premises of the company in January 2020. Energy Audit is presented in Appendix D.

Some key features of the opportunities for improvement is to increase personnel awareness and personnel behaviour. Thus opportunities for improvement must control the variables affecting user's behaviour such as office occupancy, the operating hours of the equipment and energy consumption through the capacity and energy efficiency of the installed of equipment. As such the indoor air conditioning systems will be set to temperatures of 26 degrees Celsius during summer days from May to September and 22 degrees Celsius during winter days from November to March.

Another feature is to set the computers to self-hibernate after 15 minute of idle time in order to reduce energy consumption in office equipment. Also printers and scanners will be shut down when not in use.

Another opportunity for energy savings is to install occupancy sensors at corridors, restrooms, conference rooms etc. Other measures that were examined in the energy audit in different scenarios are external shading, rooftop insulation, fans in the offices etc.

Some of the above measures require low capital investment and some are considered soft measures that do not need capital investment. The following table describes in detail the opportunities for improvement.

Energy Efficiency Measures-opportunities for improvement
Occupancy sensors in bathrooms, conference rooms
Occupancy Sensors in Open Offices
Recessed spot led from 12 W change led to 6W at 82 units
External Shading Devices - Annual Average Shading Factor (AASF) of 0.5
Insulation of Roof : U-value of 0.4 from 0.85
Ceiling Fans for Office Spaces
Temperature Setting of VRF at 26C° during summer
Temperature Setting of VRF at 22C° during winter
Set Desktops to turn off after 15 minutes of idle time

Table 10. Proposal for energy efficiency measures

5.8 Energy Baseline

The baseline construction was based on the statistical methodology of linear regression analysis as described in the energy plan manual.

After analysing the data, we came up with 14 total cooling degrees days along with 14 consumption of electricity (cooling period starting from 1st of May up to 30th of September each year). The below graph shows the electricity consumption correlated with the total cooling degree days. The electricity consumed (dependent variable y) is described by the equation shown in the graph and is dependent from the cooling degrees variable x. The $R^2 = 0.9417$ that shows good correlation of data and thus there is a dependent relation between the two variables. The energy consumption per bimonthly during cooling period equals to $12,997X+414,97$.

Summer Period		
Date	Total CDD	Total KWh
23/7/2015	490,20	7621,00
30/9/2015	688,70	7683,20
1-26/5/2016	124,53	1989,00
25/7/2016	560,50	8321,00
30/9/2016	643,20	9210,60
1-24/5/2017	127,15	2124,00
25/7/2017	581,70	8496,00
30/9/2017	648,95	10064,60
1-23/5/2018	176,50	2542,65
23/7/2018	556,85	7163,00
30/9/2018	704,55	9749,00
1-24/5/2019	170,35	2212,80
23/7/2019	596,25	7874,00
30/9/2019	707,65	8803,20

Table 11. Analysed data for the construction of the Cooling Period Baseline. Cooling Degree Days VS kWh per corresponding period

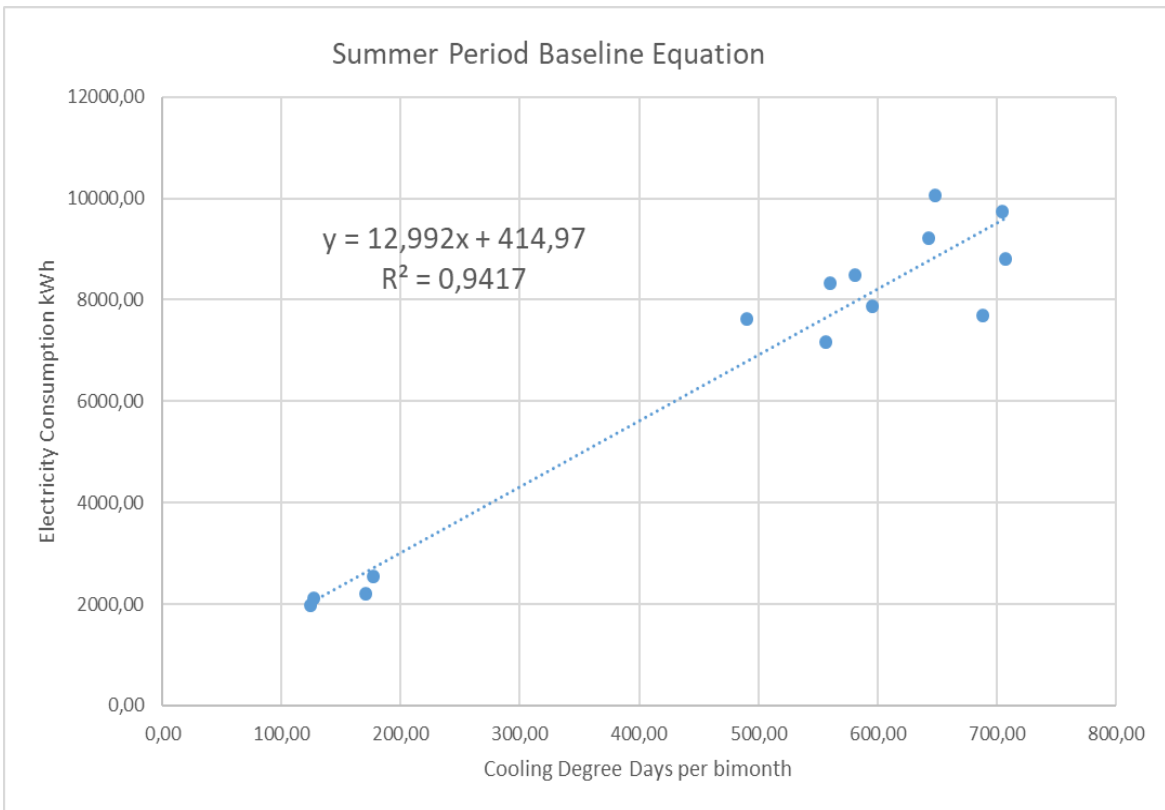


Figure 8. Graph of the baseline equation for the cooling period

Respectively for the total heating degree days per bimonthly period, they are also added to correspond to each period of recorded electricity bill as per the table below (heating period starting form 1st of November to 30th of March each year) . Thus coming up with 14 total heating degrees along with 14 consumption electricity.

Winter Period		
Date	Total HDD	Total kWh
1-24/11/2015	40,93	1430,40
27/1/2016	389,33	6185,00
30/3/2016	268,95	6603,50
1-23/11/2016	59,25	1904,40
25/1/2017	423,70	7785,00
30/3/2017	377,20	6927,50
1-23/11/2017	42,63	2173,50
24/1/2018	283,60	6890,00
30/3/2018	227,00	5499,95
1-22/11/2018	37,10	2079,00
23/1/2019	321,48	7116,00
30/3/2019	315,73	5527,80
1-25/11/2019	28,30	2067,50
27/1/2020	321,78	6981,00

Table 12 Analysed data for the construction of the Heating Period Baseline. Heating Degree Days VS kWh per corresponding period

The below graph shows the electricity consumption correlated with the heating degrees. The electricity consumed (dependent variable y) is described by the equation shown in the graph and is dependent from the heating degrees variable x. The $R^2 = 0.9075$ shows an existing correlation between heating degree days and the electricity consumption. The energy consumption per bimonthly during heating period equals to $14,88x + 1666,9$.

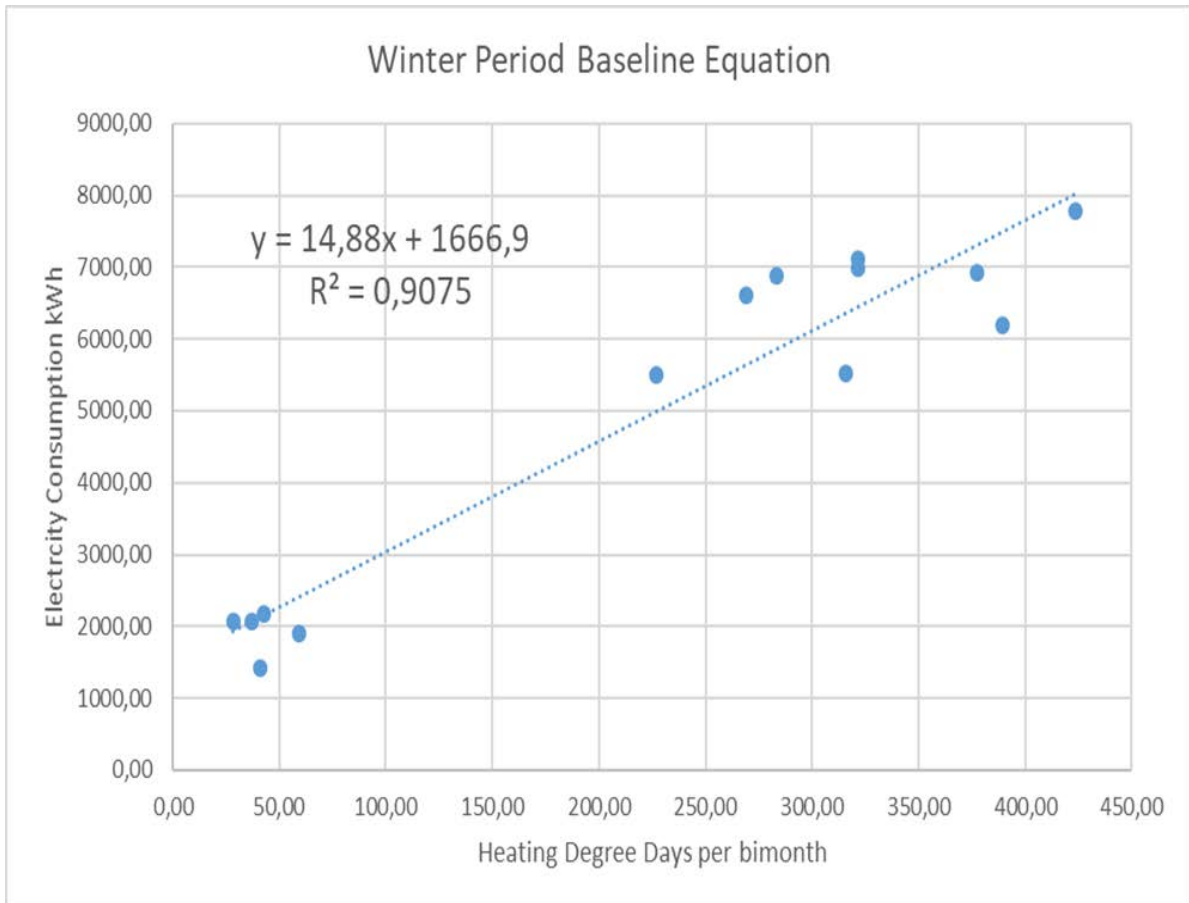


Figure 9. Graph of the baseline equation for the heating period

Last at the table below it is presented the period where no heating or cooling is used. This period is assumed each April and October per year. The data were derived from the electricity bills and are normalized in order to correspond to that period based on the energy plan procedure. As such, an average of electricity consumed per month is calculated at 2653 kWh. This means that this electricity consumption of around 2000kWh to 2500kWh per month is considered as baseload consumption meaning that this is the electricity consumed by all other equipment except VRF units. The split units of the server room plus the air handling units were also included as a baseload.

Moderate Period April and October		
Date	Total kWh	
Οκτ-15	1848	
Απρ-16	2295	
Οκτ-16	2566	
Απρ-17	2655	
Οκτ-17	2934	
Απρ-18	3316	
Οκτ-18	2930	
Απρ-19	2766	
Οκτ-19	2564	
Average per month		2653

Table 13 *Analysed data for the Moderate Period where no heating and cooling is needed.*

To compare for each future bimonthly period with the energy baseline and if energy consumption has been reduced, the calculation of heating/cooling degrees of the aforementioned bimonthly period must be added and inserted in the above baseline equations. Thus the new adjusted baseline will give as a result, what the energy consumption would be if the weather was the same, allowing the Management Representative to come to better results regarding the energy consumption and patterns.

5.9 Energy Performance Indicators

It was decided to set energy performance indicators in order to have a basis measurement and be able to compare with future results. In particular, it was decided to divide the energy consumption per bimonthly results for each period with the 405 m² of the office. The table below contains the average electricity consumption per period as well as the set indicator.

a/a	Item	Measurement	Energy Performance Indicator (per m ²)
1	Average Consumption per heating period (KWh)	15030 kWh	37,1 kWh/m ²
2	Average Consumption per cooling period (KWh)	19637 kWh	48,5 kWh/m ²
3	Average Consumption per moderate period (kWh)	5000 kWh	12,34 kWh/m ²

Table 14 *Energy Performance Indicators per period*

5.10 Energy Objectives and energy targets

The objective applies to the whole business operations. In the future it can be divided to separate actions or sections of the company (i.e. local clientele vs offshore companies, heating/ cooling, lighting). For the first year of the implementation of the Energy Management System the objective will be simple. Thus objective is to reduce electricity consumption of the firm's offices. In the future years with more experience this can change and the objective can be divided into subsectors such as reduction of electricity on heating or cooling or office equipment etc.

The targets setting should involve employees and management of the business in the whole operation from the identification to the setting of targets and should be communicated along with the targets across the employees. This help employees to commit their actions and efforts into the implementation of the system. Management should provide the necessary resources and commitment (personnel or technological) to achieve the targets. The following table sets the objectives and the targets of the next year.

Objectives	Targets
Reduction in electricity consumption	Energy savings of 20%

Table 15 Objective and corresponding target

5.11 Energy management action plans

The table below represents the action plans established in order to achieve objectives and targets. The table was derived by the energy audit in Appendix D were Top Management chose the measures to be implemented based on the criteria set in the energy manual.

Based on the Energy Audit the below energy efficiency measures were chosen by the Top Management in order to start implementing the Energy Management System. The measures include:

- 1) Occupancy sensors in various common rooms, restrooms, kitchenette etc. The capital expenditure plus installation it was estimated at 700 Euros and based on the edgebuilding software the energy saving it was calculated at overall 6% which is around 470 Euros per year. The payback period is expected to be around 1,3 to 1,8 years.
- 2) Change of the lighting fixtures of led (downlights) at the corridors from 12W per led to 6 W. It was estimated at 5 euros per lamp including installation. At 82 pieces this comes to 410 euros. The saving is 2,21 % of total energy consumption with a total payback period of $410/173.36=2.36$ years. The low savings is because we already have low installed capacity due to led lamps that are used.

Energy Efficiency Action Plans	Expected Energy Savings as % of Total consumption per year	Energy Savings in Euro per year @0,195Euro/kWh	Capital Expenditure	Payback period in years	Environmental Evaluation Avoidance in CO ₂ kg	Responsible Person	Timeframe
Occupancy sensors in bathrooms, conference rooms*	4.63%	€ 364.69	€ 500	1.37	2263	Mrs Despoina Amerikanou	June to July 2020
Occupancy Sensors in Open Offices *	1.36%	€ 106.87	€ 200	1.87	663		
Recessed spot led from 12 W change led to 6W at 82 units	2.21%	€ 173.94	€ 410	2.36	1079		
Total of hard measures	8.19%	€ 645.5	€ 1100	1.7	4006		
Training of Personnel on Energy Efficiency	--	--	€ 0	0.00	0	Mrs Miranda Symeou	June to July 2020
Temperature Setting of VRF at 26C° during summer	4.46%	€ 351.00	€ 0	0.00	2178		
Temperature Setting of VRF at 22C° during winter	4.46%	€ 351.00	€ 0	0.00	2178		
Set Desktops to turn off	5.94%	€ 468.00	€ 0	0.00	2904		

after 15 minutes of idle time							
Total of soft measures	14.85%	€ 1,170.00	€ 0	0	7260		
Total of the soft measures and costly measures	23.09%	€ 1815.5	€ 1100	1.7	11266		

Table 16 Action Plans, Savings, Capital Expenditure and Responsibilities

Soft measures were also included. They have no cost but they depend on the user's attitude and can add a lot to the energy saving. The two most important measures are to lock the temperatures of the air conditioning units at 26 C° during summer days and 22 C° during winter days. This will reduce the operating hours of the VRF units as it will need less time to bring the office at the requested temperature. This simple measure will have a significant impact of 4,46% energy saving at the total consumption per year. Another important measure that has no cost is to set the computers desktops to hibernate after 15 minutes of idle time. This will also have an impact on energy consumption as the computers operating hours are reduced and the total energy savings is 5,94%.

The low expenditure scenario overall has 1100 Euros expenditure with a total expected energy saving at 23% and a payback period at 1,7 years and a CO₂ equivalent avoidance is 11266 kg (1,21 kg per kWh).

Chapter 6

Energy Plan Manual

The purpose of this manual is to describe in detail the Energy Planning process which is part of the Energy Management System (EnMS) based on the ISO 50001:2018. It is part of a set of documents and files that represent the Energy Management System and apply for its implementation.

6.1 Responsibility

The responsibility to write, update and follow through this document lies upon the Energy Management Team. The Management Representative accepts any changes and the Top Management agrees and signs the available documents.

6.2 Legal and Other Requirements

All legal and other requirements that are related to EnMS implementation are followed through and updated using the table in Appendix B. All existing legislations, rules and agreements European or National that apply on energy use and the organization, are respected and followed through. The organization complies with such legislation at all aspects of its operations and during maintenance of the equipment. Stakeholders are informed through email to comply with energy legislation. Especially during maintenance of air conditioning equipment Energy Management Team checks the permits and contracts with the company in order to provide access to the equipment.

6.3 Energy Uses

Uses are recorded, archived and reviewed once a year by the Energy Management Team . The following information is also recorded:

- 1) Energy consumption or calculation if its considered significant or not.
- 2) Description of the installed equipment.
- 3) Capacity of the installed equipment.

6.4 Data Management, Collection and Analysis

The firm identifies the data and information needed to successfully outline its energy status, determine its energy efficiency and identify opportunities for energy efficiency. These data are

described below and in more detail in Appendix D (Energy Audit). The Energy Management Team is responsible for the data collection and recording, archiving them and review them once a year by using the relevant table form. All data are collected through the Electricity Authority of Cyprus bimonthly electricity bills. The electricity bills state the period of consumption, the energy consumption in kWh and the price of electricity. The bimonthly bill is scanned and saved in pdf format at the appropriate electronic file of electricity bills at the server.

6.5 Significant Energy Uses

In order to identify Significant Energy Uses (SEU), it is advisable to determine the energy balance of the office. The methodology for determining the energy balance has the following steps:

- 1) Create a list of the equipment that includes nominal capacity and theoretical annual operating hours.
- 2) For each piece of equipment, there is an assessment of the "load factor" and the "operating factor" which have the meaning given to them below:
 - ✓ Load factor is the ratio of the average capacity of the equipment during operation, in terms of its nominal capacity.
 - ✓ Operating factor is the ratio of the duration of time during which the equipment actually operates, in terms of the total annual operating hours.
- 3) Once the above factors have been assessed, the annual consumption of each of equipment is calculated taking into account the energy consumption data so that the theoretically calculated consumption agrees with the real one.

Energy Consumption (kWh)=Nominal Capacity Installed (kW) X Load Factor X Operating Factor X Hours of Operation

- 4) After calculating the annual energy consumption for equipment, the individual consumption is added up and compared to the actual total annual consumption of the office.
- 5) If the calculated total annual consumption of the office agrees with the actual one then the calculated consumption for each equipment is recorded and used for their classification. Alternatively, consumption rates are modified until the calculated and actual consumption is balanced.
- 6) In order to select significant energy use (SEUs) it should represent at least 10% of the total annual consumption of the office.

It is important to note that due to the empirical determination of the load factor and operational hours factors there is a possibility of over or under representing the actual energy consumption.

In the future, individual smart meters should be considered for the significant energy use equipment and external advising should be provided.

6.6 Identification of opportunities for improvement

The main tool for the identification of opportunities for improvement is the Energy Audit conducted. In the Energy Audit three scenarios are suggested with several measures included. The Management will be presented in each management review the measures suggested along with their capital cost, energy savings, CO₂ eq savings and simple payback period. The final approval will be upon the Top Management based on the above criteria. At the following years the measures can be selected from the various scenarios of low, moderate and high capital of the energy audit. Each measure has its own cost and energy saving.

The simple payback period is calculated in monetary value using the capital cost of the introduced energy efficiency measure divided by the energy savings achieved of that specific measure assuming 0,195 Euro/KWh.

6.7 Baseline Construction

The baseline construction is based on the statistical methodology of linear regression analysis. The energy baseline data were collected from bimonthly bills from May 2015 to January of 2020.

Due to the fact that the most important energy consumption is the heating and cooling of the offices and because of the main variable affecting this consumption is the change of outside temperature and the mode of VRF operation (heating and cooling) of the central air conditioning systems, it was decided that the statistical analysis of the data should be carried out by dividing each year into three periods:

- 1) Cooling Period starting from 1st of May up to 30rd of September
- 2) Moderate Period each April and October per year
- 3) Heating Period starting from 1st of November to 30th of March

The maximum and minimum temperature (° C) at 8 am and 1 p.m of daily data for 28th May 2015 onwards to 27th of January 2020, were downloaded from the Department of Meteorology of Cyprus website and used to calculate the daily heating and daily cooling degree days (DAILY HDD and DAILY CDD). For maximum daily temperature it was used the available temperatures during working hours at 13:00 p.m and for the minimum daily temperature the 8:00 a.m for working days only. The weekends and holidays were excluded from the analysis. The methodology used was in accordance with the British Meteorological Office (CIBSE, 2006), in which for each period separates 4 cases and corresponding 4 types of calculations of the degree days, as shown in two Tables below, where:

θ_{\max} daily maximum temperature (° C)

θ_{\min} daily minimum temperature (° C)

θ_b reference base, 22 ° C for HDD and 18 ° C for CDD

Case	Condition	Daily cooling degree-days
1	$\theta_{\min} \geq \theta_b$	$\frac{1}{2} (\theta_{\max} + \theta_{\min}) - \theta_b$
2	$\theta_{\max} > \theta_b$; and $(\theta_{\max} - \theta_b) > (\theta_b - \theta_{\min})$	$\frac{1}{2} (\theta_{\max} - \theta_b) - \frac{1}{4} (\theta_b - \theta_{\min})$
3	$\theta_{\min} < \theta_b$; and $(\theta_{\max} - \theta_b) < (\theta_b - \theta_{\min})$	$\frac{1}{4} (\theta_{\max} - \theta_b)$
4	$\theta_{\max} \leq \theta_b$	0

Table 17. The Meteorological Office equations for calculating cooling degree days for offices (CIBSE 2006, Technical Manual 41)

Case	Condition	Daily heating degree-days
1	$\theta_{\max} \leq \theta_b$	$\theta_b - \frac{1}{2} (\theta_{\max} + \theta_{\min})$
2	$\theta_{\min} < \theta_b$; and $(\theta_{\max} - \theta_b) < (\theta_b - \theta_{\min})$	$\frac{1}{2} (\theta_b - \theta_{\min}) - \frac{1}{4} (\theta_{\max} - \theta_b)$
3	$\theta_{\max} > \theta_b$; and $(\theta_{\max} - \theta_b) > (\theta_b - \theta_{\min})$	$\frac{1}{4} (\theta_b - \theta_{\min})$
4	$\theta_{\min} \geq \theta_b$	0

Table 18. The Meteorological Office equations for calculating heating degree days for offices (CIBSE 2006, Technical Manual 41)

After analysing the data in an excel file presented in Appendix E the cooling degree days were added to correspond to each period of recorded bimonthly electricity bill for the cooling period. The same is conducted for the heating period.

Due to the fact that bimonthly periods does not correspond exactly at the start and stop of cooling/heating period as electricity bills are recorded at the end of September going through the end of November and the same for the end of March to the end of May the following was conducted:

- 1) During those two periods above. The energy consumed is divided with the total corresponding days of the recorded electricity bill resulting to an average daily energy consumption. The total degree days and the corresponding average daily energy consumed are then added to the corresponding electricity bill. Up to the end of September to the previous electricity bill, the consumption of October is considered moderate period, and from the 1st of November onwards is added to the following electricity bill.
- 2) The October and April average daily consumption multiplied by the corresponding days of the month is resulting the averaging consumption of the moderate period where heating and cooling is not needed.
- 3) The period up to the end of March is added to the previous electricity bill and the period between the 1st of May and onwards is added to the following month.

Based on the data gathered, two graphs are sketched (scatter plot) with the x axis representing the cooling/heating degree days per bimonthly and the y axis representing the energy consumed per bimonthly. Next through excel formulas and functions the linear trendline is added that represents the energy consumed per bimonthly for each period the electricity bill is recorded. The coefficient of determination R^2 shows the correlation of data if there is a dependent relation between the two variables. If R^2 is above 0,85 then the represented equation is accepted that it can show a dependence between energy consumption and outside temperature. For the moderate period no graph is sketched but a table is created with total average of energy consumed.

6.7.1 Benchmarking

The baseline developed above is the energy savings benchmark for the office consumption and is a useful tool for calculating the actual energy savings that are achieved by implementing energy efficiency measures and are not because of better weather conditions.

When comparing the actual energy consumption of a future reporting bimonthly period, it should be compared with the adjusted energy baseline consumption per bimonthly. The adjusted energy baseline consumption per bimonthly is the consumption that would have been occurred if the energy saving measures had not been implemented but with the weather conditions of the reporting period.

It is noted that, during the comparison of the actual future energy consumption with the adjusted energy baseline consumption the above periods might change due to weather conditions differentiation and as such further adjustments should be made.

This adjusted energy baseline consumption is calculated using the above benchmarking model and specifically using the correct cooling or heating period equation. The variable x value is set as the total cooling or heating degree days of the reporting period and the result is a theoretical

energy consumption (Adjusted Baseline Energy) if no energy efficiency measures were implemented.

The following formula represents the above benchmarking:

Actual Energy Savings= Adjusted Energy Baseline Consumption per period– Actual Reporting Energy Consumption per period

6.8 How to Define Energy Performance Indicator

The Energy Performance Indicators (EnPI) of the office are identified, determined, archived and revised for every cooling/heating/moderate period by the Energy Management Team. The Energy Performance Indicator is defined as the energy consumed in kWh per reporting period divided by 405m² of the office space.

Benchmarking of the EnPI is basically the same as above. The actual EnPI is compared to Adjusted Energy Performance Indicator of the reporting period as derived by the Adjusted Energy Baseline Consumption per period divided by the 405m² of the office space.

Each year depending if energy savings measures are implemented this comparison must show improvement. This means that the ratio between the Adjusted Energy Performance Indicator per period/m² divided by the Actual Energy Performance Indicator per period/m² should increase. It is noted that if EnMS is implemented correctly the Actual EnPI should always be less than the Adjusted EnPI and the ratio above 1.

During the Management Review the overall the Actual Energy Performance Indicator (summation of all periods) can also be presented and compared with the overall Adjusted Energy Performance Indicator.

6.9 Define of energy objectives and targets

Energy objectives and targets are defined and approved by the Top Management, controlled by the Management Representative and suggestions are made by the Energy Management Team,. The communication is done through official email between the Energy Management Team and the Management. The communication is recorded and saved in the server. Energy objectives and targets are reviewed on an annual basis and the following are taken into account:

- ✓ Significant Energy Users (SEUs).
- ✓ Priorities on energy savings measures
- ✓ Legal obligations or buildings regulations updates
- ✓ Financial/technological/operational issues
- ✓ Stakeholders views

The percentage of the energy objectives and targets are achieved is reported to the Top Management through the process of the annual Management Review.

6.10 Energy Action Plans Development

When the energy objectives and targets are set, the Top Management defines how these are going to be achieved. This procedure requires the evaluation of the opportunities for energy performance, the capital cost of the investment and the payback period. This evaluation is presented at the Energy Audit and the most suitable energy efficiency actions are defined by the Top Management.

For each action/task the responsible person is selected, the budget is estimated , the timeframe for implementation, the method to define the energy saving and the expected improvement on energy performance indicator are recorded using the appropriate table.

All the above are displayed in a table and communicated to the Management.

Chapter 7

Energy Management System Procedure Manual

The purpose of this manual is to describe in detail the Energy Management System procedures for all other processes which are part of the Energy Management System (EnMS) based on the ISO 50001:2018. It is part of a set of documents and files that apply for its implementation.

7.1 Responsibility

The responsibility to write, update and follow through this document lies upon the Energy Management Team. The Management Representative accepts any changes and the Top Management approves and signs the available documents.

7.2 Requirements for documentation

For the development of the EnMS, manuals, procedures and forms have been developed, which include within others:

- ✓ Company description
- ✓ The business framework
- ✓ Energy Policy
- ✓ The scope of the EnMS
- ✓ The boundaries of the system
- ✓ Job description manual
- ✓ Procedures manual
- ✓ Energy Plan and Energy Plan Manual
- ✓ Legal Requirements

7.3 Leadreship

The top management appoints the Management's Representative and the Energy Management Team by an official letter that states the start date of appointment, their duties and their responsibilities. The Energy Management Team can be one or more persons and the qualifications can be fulfilled as a team. The following qualifications must be taken into account when the Top Manager assigns duties and responsibilities.

Management's Representative Qualifications

- ✓ Good interpersonal skills, including written and oral communication.
- ✓ Time management skills.
- ✓ Organizational skills.
- ✓ Problem-solving abilities.
- ✓ Leadership.
- ✓ Conflict management skills.
- ✓ Good computer skills.
- ✓ Good knowledge of ISO 50001 standard.

Energy Management Team Qualifications

- ✓ Good interpersonal skills, including written and oral communication.
- ✓ Time management skills.
- ✓ Organizational skills.
- ✓ Problem-solving abilities.
- ✓ Good computer skills.
- ✓ Good knowledge of ISO 50001 standard.
- ✓ Understanding of basic technical issues regarding energy metering and measurement
- ✓ Control of equipment (setting operations time, setting temperatures etc)

7.4 Procedure for the Control of Documents and Records

Scope of the procedure:	This process refers to the actions taken to control the documents of the energy management system, as well as external documents relating to the company.
Responsibility:	Management Representative, Energy Management Team, Supporting Role the Secretariat and Registry Department
Relevant documents:	Various Documents in hardcopy or electronic, emails, official letters, reports and manuals

7.4.1 Approval and Coding of Documents

The Top Management has the responsibility for the approval or re-approval (obtained after revision) of the energy policy. The responsibility for the approval and re-approval (obtained after

revision) of the remaining documents of the energy management system belongs to the Management Representative in consultation with the company's senior associates.

The Energy Management Team has the right to edit or update all documents and procure for approval to the Management Representative. No other member of personnel has the right to create and modify documents of the EnMS without the prior approval of doing so by the Management Representative.

Proposals for the creation of new documents are acceptable by any member of the personnel. Proposals will be sent to the Management Representative for approval or rejection.

Once the document is approved, the following actions will take place:

1) In the case where we have the creation of a new document then the following procedure is followed:

- The date and the version number are recorded at the lower left part of the new document e.g. 01/02/2020-1.
- The new document is converted to a «PDF» format and archived in the server.
- Inform the personnel involved in the use of the new document.

2) In the case where we have the creation of a new manual (to update the procedure manual) then the following procedure is followed:

- The version, publish date, status, and the approval date are recorded on footer on every page of the new manual
- The new document is converted to a «PDF» format and archived on the server
- The personnel involved in the use of the new manual will be informed

7.4.2 Storage of Documents

The documents of the Energy Management System, the storage area and the recipients are recorded on the file «List of Documents» by the Secretariat. Furthermore, the entire system is stored electronically on the server. In the case where a document is printed and it is not intended for an official use, then it must have the marking «Unofficial Document» at the lower left part of every page.

7.4.3 Amendments on Existing Documents

Proposals for modifications on existing documents of the system are acceptable by any member of the personnel. Proposals will be sent to the Management Representative for approval or

rejection. This decision will be decided after investigation and consultation with the personnel involved.

Once the modification is approved, the Management Representative will proceed with the following actions:

- The new date will be recorded and the version of the amended document on the lower left part e.g. 1/02/2020 - 2.
- The new document is converted to a «PDF» format and archived on the server.
- The obsolete version (previous version) is removed from the server.
- Inform the personnel (about the amendments) involved in the use of the new document.
- If the new document is only a hard copy, then proceed with scanning the document and archive it.

7.4.4 External Documents (government documents, bank documents, laws, standards etc.)

The Management Representative of the organization in collaboration with the Energy Management Team, monitors the new legislation and / or changes in existing laws and / or adoption of new standards for the company through periodic (once a year or appropriately) contacts with government agencies and by visiting webpages such as:

- www.europa.eu.int and www.europa.eu.int/eur-lex/ – For EU Legislation
- <http://www.mcit.gov.cy/mcit/energyse.nsf> -Department of Energy Service
- <http://www.moa.gov.cy/moa/environment> - Department of Environment
- www.mlsi.gov.cy/dli – Health and Safety Legislation
- www.cys.org.cy – Cyprus Standardization Company
- www.eac.com.cy – Electricity Authority of Cyprus

Changes on external documents by the relevant authorities listed in Appendix B are downloaded by the Energy Management Team and archived to the server. In this case the Management Representative informs the personnel involved about the amendments through a memo or via email.

7.4.5 Previous version of Documents

The controlled documents of the energy management system which are obsolete and have been replaced, are removed from the entire system. This process is performed by the Management Representative. This ensures that the company will not be using outdated forms or manuals.

The Management Representative can save or archive obsolete documents for future reference.

7.4.6 Process for Storing and Archiving Records

All company's records, without exception, are stored in areas where they provide protection and easy access. None of the files can be destroyed without the approval of the Management Representative. The method of destruction will be decided by the Management Representative. Additionally, all personnel is obliged to protect the files that it uses.

The identity, the duration and the responsibility for the storage of files is recorded in the electronic file List of Records by the Secretariat and the Registry Department. The Energy Management Team is responsible for maintaining the file and the Secretariat is responsible for maintaining the list of records.

All company's electronic records, including emails, are stored on the server under the file name ISO50001 Implementation.

7.5 Procedure for the Training of the Personnel

Scope of the procedure:	This process refers to the actions taken to train the personnel on the energy management system implementation, as well as training of the personnel's and stakeholder's behaviour on energy consumption and performance
Responsibility:	Management Representative, Energy Management Team
Relevant documents:	Slide presentations, Questionnaires

The Management Representative is responsible that the personnel assigned with duties which are important for the energy performance, are qualified to perform their duties. The aforementioned personnel includes the personnel of the personnel, as well as the external persons who provide services, supplies and maintenance of equipment. The above persons are identified, recorded, archived and reviewed once a year by the Energy Management Team.

Based on the tasks or actions assigned, the qualifications and learning needs of the responsible personnel are recognized, recorded, archived and reviewed annually by the Management Representative. The qualifications required may be different for each individual and are based on at least one of the following:

- ✓ Academic qualifications
- ✓ Certifications and licenses
- ✓ Experience
- ✓ Abilities
- ✓ Education

Once the potential improvements are identified, the learning needs are specified and a training plan is developed.

Contrary to the competence requirements mentioned above, the need for energy awareness is not limited to internal and external staff assigned to important energy performance tasks but concerns all personnel within the scope of EnMS. The topics related to energy awareness, equipment operation, thermal comfort etc as well as learning needs related to each subject are identified, recorded, archived and reviewed once a year by the Energy Management Team using appropriate questionnaires.

The personnel's energy awareness training is recorded, archived and reviewed once a year by the Energy Management Team and approved by the Management Representative using relevant form. Implementation of the each training is documented through the presentation of the training itself or training satisfaction questionnaires.

An energy awareness and refreshing training regarding the implementation of the energy management system and ways to reduce energy consumption to the whole personnel of the organization will be conducted once a year. The date of the training and if it is outsourced to an external trainer will be approved by the Management Representative.

7.6 Communication

7.6.1 Internal communication

The organization ensures that there is ongoing internal communication to inform personnel on energy efficiency and other EnMS issues including:

- ✓ Energy Policy of the firm.
- ✓ The importance of energy management.
- ✓ Responsibilities related to energy management.
- ✓ Energy targets.

- ✓ Energy efficiency.
- ✓ Other issues as appropriate.

The above internal communication is achieved through the following mechanisms:

- ✓ Email from the Management's Representative.
- ✓ Circulars by the Top Management
- ✓ Newsletter postings by the Energy Management Team
- ✓ Energy awareness training
- ✓ Personnel meetings
- ✓ Receiving of relevant suggestions

The overall responsibility for successful internal communication rests with the Management Representative who ensures that:

- ✓ It's on a continual basis on all organization management levels
- ✓ Contains tailor made information depending on who is the recipient
- ✓ It is multi-directional and flows not only top-down but also bottom-up

The Internal Communication processes are recorded, archived and reviewed once a year by the Energy Management Team and approved by the Management Representative using relevant form. Personnel suggestions are received through email to the Energy Management Team.

7.6.2 External Communication

Recognizing the increased interest of the public, the competent authorities, its partners, etc., in energy efficiency and sustainability, the organization has decided to communicate in appropriate periods with all (external) stakeholders in order to inform on the following topics:

- ✓ Energy policy
- ✓ Energy efficiency
- ✓ Implementation of the Energy Management System

The external communication processes are recorded, archived and reviewed once a year by the Energy Management Team and approved by the Management Representative using the relevant form which recognizes the following:

- ✓ Communication recipients
- ✓ Communication purpose
- ✓ Subject of communication
- ✓ Sender (person in charge) of communication
- ✓ Means of communication
- ✓ Frequency of communication

- ✓ Communication commencement date

As external communication tools the organization can use its Facebook account (Cyprus, Greece and Israel account), electronic newsletters, emails, circulars and/or annual report and several other hardcopy publication that are prepared from time to time.

7.7 Internal Audits

Scope of the procedure:	This process refers to the actions implemented by the internal audit mechanism which allows the company to determine whether the Energy Management System is implemented, maintained and meets the standards
Responsibility:	Management representative, Energy Management Team, Internal Auditors
Relevant documents:	Internal Audit Records, Non conformities, Incident reports

During the internal audit process, it is checked whether the requirements of the ISO 50001 standard are met and whether the energy performance is achieved. The Energy Management System of the organization shall be audited at least once a year. The scheduling and frequency of audits is determined by the management review, which takes into account the situation and the importance of processes that will be inspected, as well as the results of previous audits. One energy audit must be conducted at least two weeks prior Management Review.

7.7.1 Conducting Internal Audits

Internal audits are carried out by trained personnel which is not involved with the person responsible for the activity that is under inspection. Audits may also be carried out by qualified external consultants. The Energy Management Team prepares a report for the programmed Internal Audit, that includes the following:

- ✓ Date of the audit.
- ✓ Purpose of the audit.
- ✓ The system points to be tested.
- ✓ The requirements and criteria of the procedures to be reviewed.
- ✓ The name of the internal auditor.

Internal auditors have knowledge of the requirements of the standard and are trained as internal auditors. During the audit process, the findings are recorded using the relevant form, following these steps:

- ✓ Internal auditors record non-compliance and the findings are fully documented
- ✓ A separate form is filled in for each finding in order to be given directly to the person responsible for corrective and preventive actions.
- ✓ The person concerned shall describe the action to be taken to resolve the issue and set the completion dates.
- ✓ Upon completion of operations, the form is returned to the auditor to monitor the effectiveness of operations
- ✓ The form is communicated to the Energy Management Team and the Management Representative for control and information.

Internal audits focus on:

- ✓ Major impacts on energy efficiency such as objectives, targets, significant energy uses and measurement and monitoring.
- ✓ Factors where significant non-compliance has been identified in previous audits.
- ✓ Factors where significant changes such as equipment, processes and personnel have been made.
- ✓ Factors where changes are planned and can have a significant impact on energy efficiency.

The findings are recorded in detail on a report form by the auditor and procured to the Energy Management Team and the Management Representative.

The implementation process and timeframes of the corrective actions are monitored by the internal auditors and the Management Representative. In case where the results are unsatisfactory or the timeframes are unrealistic then new corrective action and / or schedules are set up which are documented in the Incident Report form.

7.8 Procedure for the Corrective and Preventive Action and Follow-up

Scope of the procedure:	This procedure defines the steps to identify and manage non-conformities, as well as deciding on implementing corrective, preventive or improvement actions and monitoring the efficiency of those actions.
Responsibility:	Management Representative, Energy Management Team, Internal Auditor, Personnel assigned with the action (Task Manager)

Relevant documents:	Documents for Non-Conformities, Corrective Actions and Monitoring
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Through internal audit which is conducted at least once a year or through everyday tasks, all personnel can identify a possible problem or a non- conformity of the system. The problem is reported through email to the Management Representative in case of everyday tasks or through the internal audit report at the time of the report. The Management Representative tries to identify the most suitable person to act as a Task Manager based on its previous experiences and training and assign the individual as responsible to investigate the root of the problem.

Task manager investigates the root of the problem, and if external consultant is needed to help with the identification, then the task manager informs and gets an approval from the Management Representative to hire an external consultant.

After the root of the problem is identified the Management Representative is informed and possible solutions are discussed and decided.

The appropriate solution is then implemented by the task manager or an appropriate company through outsourcing is assigned to mitigate the problem. If a company is hired to fix, maintain or provide any solution the task manager is responsible to procure a tender process with at least three tenderers if the estimated cost is above 1000 euros. The cost is then communicated and approved by the Manager Representative.

After the implementation, the solution is documented at an appropriate document and is monitored the first 48 hours for its adequacy. If it is successful, then is communicated by the task manager through email to the personnel of the firm for the solution of the problem. The task manager is responsible to conduct confirmation checks after one month and after six months and then assigned to the internal auditor for their annual check.

Internal Auditor shall make a follow-up of the solution during audit to check the implementation of the corrective action and the effectiveness.

7.9 Monitoring and Measuring

Scope of the procedure:	This Procedure describes how the Organization monitors and measures the key characteristics of its energy management system.
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Responsibility:	Management Representative, Energy Management Team, External Consultant
Relevant documents:	Electricity Authority Cyprus bimonthly bills, other relevant documents

The organization ensures that the factors that determine the energy performance of the system such as significant energy use, energy performance indicators and the effectiveness of action plans, are monitored, measured and analysed. These key characteristics are identified, recorded, archived and reviewed once a year or whenever required by the Energy Management Team and approved by the Management Representative using relevant form. The form may include among others:

- ✓ Data measured and monitored.
- ✓ The method of measuring the data.
- ✓ Expected values.
- ✓ Measurement discrepancies and discrepancy criteria.
- ✓ Actions taken in the event of significant discrepancies.

The Energy Management Team, clearly define the Organization's EnPIs through the procedure described in the Energy Plan Manual once a year and monitor the procedure for the performance of energy performance indicators. Every two months the Energy Management Team should collect all information about the energy consumption through EAC electricity bill, i.e. kWh of electricity consumption, kWh price, corresponding period and scan and save the bill in the appropriate file.

Moreover the Energy Management Team will download weather data of the Athalassas Weather Station from the Meteorological Department website and register the corresponding temperatures at 8am and 1 pm for the period of the electricity bill. Then by following the appropriate procedure and formulas described in the Energy Plan Manual will calculate the degree days for the corresponding period. The new degree days will be used at the energy baseline equation and the adjusted energy consumption will be calculated. Once the adjusted energy consumption is calculated, the adjusted energy performance indicator of the corresponding period will also be calculated and then it will be compared with the actual bimonthly consumption and the actual energy performance indicators.

The results will be communicated via email to the Management Representative. If the energy savings are less than 5% for the period a relevant meeting between Management Representative and the Energy Management Team should be conducted in order to discuss corrective or

preventive actions. If appropriate the meeting can attend the people responsible for the maintenance of equipment.

The new data are saved on the appropriate calendar date at the file Baseline Construction Data. Also a Bimonthly Summary Report is prepared to record with the adjusted energy consumption, the adjusted energy performance indicator, the actual energy consumption, the energy performance indicator and the relevant comparisons .

7.10 Review of Energy Objectives and Targets

Scope of the procedure:	This process refers to the methodology used to review the organizations energy objectives and targets
Responsibility:	Top Management, Management representative , Energy Management Team
Relevant documents:	Objectives and Targets Table

Energy objectives, energy performance indicator and energy targets are reviewed and updated during a Management Review meeting if appropriate at the following:

- ✓ Top Management request for more energy savings
- ✓ After energy consumption alterations are recorded or any energy consumption events
- ✓ After building of new facilities or modifying existing facilities
- ✓ After purchasing equipment change
- ✓ Following the adoption of new legislation that affects the organization’s activities.
- ✓ After changing existing operating processes
- ✓ After change of personnel

The review will be shown in Management Review Minutes and in a new table of the Objectives and Targets by reviewing the relevant affected numbers and activities.

7.11 Legal and other requirements

Scope of the procedure:	This process refers to the methodology used to review the legal compliance and other requirements
Responsibility:	Top Management, Management representative , Energy Management Team
Relevant documents:	Table of legislation

The firm identifies and records the legal and other obligations that relate to energy use, energy consumption, and energy efficiency. At the same time, it determines how these obligations apply to the above factors and ensures that they are taken into account in the development and implementation of the Energy Management System.

The above information is recorded, archived and reviewed once a year by the Energy Management Team.

Currently the organization records and comply with the following legislations substances that deplete the ozone layer and fluorinated greenhouse gases handling due to the air conditioning maintenance.

7.12 Maintenance of equipment

Scope of the procedure:	This process refers to the methods by which the organisation maintains its equipment and facilities.
Responsibility:	Management representative, Energy Management Team and Outsourcing
Relevant documents:	The relevant documents for corrective or preventive maintenance included in the maintenance contract

All organization's equipment receives the necessary maintenance and control in order to ensure its appropriateness of operation and its performance. All of the equipment (variable refrigerant flow units, air handling units, air conditioning split units, desktop computers, faxes, printers, copy machines, telephone systems, server, ups, kitchen equipment) undergoes maintenance every year or appropriately based on manufacturers guidelines.

Operation Mode

In the context of internal communication, the Energy Management Team compiles and disseminates to the personnel the guides for Energy Management Good Practices described below and attached as Appendix C. The Management's Representative is responsible for checking and revising or adding new guides whenever required.

- ✓ Energy Management Good Practices - Lighting
- ✓ Energy Management Good Practices - Heating & Air Conditioning

✓ Energy Management Good Practices - Office Equipment

Maintenance

The Energy Management Team and the external IT Officer are responsible for the maintenance supervising of office equipment and they must be informed when a damage occurs. Periodic maintenance is applied for the VRF units, split units and the HRV units based on the ongoing contract. All units and the office equipment are registered in Appendix D. If changes apply the relevant tables are updated by the Energy Management Team.

Air Conditioning System Inspection

Central air conditioning systems are inspected in accordance with the Air Conditioning Inspection Guide referred to in "Adjusting the Energy Efficiency of Buildings (Air Conditioning Inspection)" Decree of 413/2009.

The inspection is carried out by an inspector, registered in the list of air-conditioning system inspectors of the Ministry of Energy, Commerce and Industry (outsourcing) using the relevant form attached in the relevant legislation. The same decree also specifies the frequency of inspections according to the capacity of the air conditioning systems.

Fluorinated Gases

Through its maintenance contracts, the organization controls, maintains and repairs equipment containing fluorinated gases (a/c units) to prevent any loss of fluorinated gases to the environment. Requirements arising per equipment fall under Regulation (EU) No 178/2010 517/2014 of the European Parliament and of the Council. All maintenance performed on this equipment is by certified personnel. During the work, the relevant form is filled and stored the records of the Energy Management System for 5 years. The technician must be enrolled in the Environmental Department registry as an approved refrigerant handler.

7.13 New Design or modifying existing equipment

Scope of the procedure:	This process refers to the actions taken by the Energy Management Team in order to ensure the new design or modifying of existing equipment comply with the Energy Management System.
Responsibility:	Management representative, Energy Management Team
Relevant documents:	Relevant communications via email with external contractors or managers.

When designing new or modifying existing equipment, energy efficiency is taken into account to comply with Energy Policy, objectives, energy saving targets, relevant legislation and action plans. In particular, the following shall be taken into account:

- ✓ The impact of new design features on energy performance
- ✓ The expected reduction in energy consumption and / or other benefits
- ✓ Possible advanced technological solutions and their techno-economic viability
- ✓ Particularities in operation and user friendliness

During the designing process, the Management Representative and the Energy Management Team is informed and consulted and any views are communicated to the external project manager.

7.14 Purchasing of Energy Products and Equipment

Scope of the procedure:	This process refers to the actions taken by the Energy Management Team when purchasing of energy products and equipment in order to ensure compliance with the Energy Management System.
Responsibility:	Management representative, Energy Management Team
Relevant documents:	Relevant communications via email with external suppliers, equipment data forms

The Energy Management Team is responsible for any purchasing of energy products or equipment after consultation and approval with the Management Representative. The criteria for purchasing energy efficient products, services and equipment is taking into account the life cycle cost that should covers, to the extent appropriate, some or all of the following types of costs over the life cycle of the product or service:

- ✓ Initial capital cost for purchasing
- ✓ Costs of operation, such as electricity consumption and hibernation consumption and other
- ✓ Maintenance costs
- ✓ dismantling/ end-of-life costs such as collection and recycling costs

As regards to the electricity provider, at present, the Cyprus Electricity Authority has the monopoly of the market for the purchase of energy, so no issue has been raised for the purchase of energy by another provider.

7.15 Procedure for Management Review

Scope of the procedure:	This process refers to the actions taken by the management in order to ensure the appropriateness and adequacy of the Energy Management System.
Responsibility:	Top Management, Management Representative, Energy Management Team, Partners, Senior Associates
Relevant documents:	Management Review minutes

The purpose of the management review meeting is to ensure the adequacy of the company's Energy Management System. The review meeting is conducted at least once a year (most suitable at the end of the year) and is arranged by the Top Management personal assistant which convenes all the following participants:

- ✓ Managing Partner (Top Management)
- ✓ Management Representative
- ✓ Energy Management Team
- ✓ Partners
- ✓ Senior Associates
- ✓ Any member of the staff can be invited by the management to participate
- ✓ Personal Assistant to hold the minutes

The agenda of the management review and all relevant documents are communicated via email to the participants by the Top Management's personal assistant. The agenda will include the following topics:

- ✓ Energy Policy review
- ✓ Energy targets, energy objectives, action plans state of play and review
- ✓ Energy Performance Indicators (EnPIs) review, current and future energy consumption.
- ✓ Changes in legislation and other obligations and further compliance status
- ✓ Results of external and internal audits
- ✓ Analysis of customer complaints

- ✓ Defining stakeholder needs
- ✓ Brief presentation of non-compliances and the status of their corrective and preventive actions
- ✓ Communication with external stakeholders
- ✓ Training needs and assessment of trainings
- ✓ Suggestions for improvement
- ✓ Follow up on decisions and actions of the previous management review

During the management review, minutes will be taken. The responsibility for informing the staff affected by the decisions of the review lies on the Management Representative. The Management Representative has also the responsibility to monitor the implementation and set the timeframe for implementation of the decisions. The management review minutes are communicated by the personal assistant to all participants.

Chapter 8

Conclusions

The Energy Management System is going to be implemented in the legal firm for the first year. As such a limited number of actions and not so optimistic target was set. A lot of soft measures (training, temperature settings of a/c, desktops hibernation etc) were chosen at first, so that they can be easily implemented and achieve the set targets. The plan is to achieve results that will make a difference in the financials of the organization through cost reduction but without compromising the viability of the system. This will convince management to invest more on resources to achieve more results. This will also increase employees awareness and will make them part of the system and the procedures. The targets can be increased as the system matures and the personnel involved will gain experience.

At the first years of implementation of an energy management system on a small medium enterprise, especially ones with no technical background, the objectives and subsequent targets should be simple, realistic, achievable, appropriate, consistent with the firm's mission, comply with any legislation requirements, take into account stakeholders opinion and based on the energy policy of the business. The organization should have the ability to control its objectives (i.e. the objectives must be dependent from the company's actions), to monitor, record and report their progress (i.e. should be specific and quantifiable) without creating more red tape than absolutely necessary.

One of the most important section of the energy management system is the significant energy use identification. It is a part of the system that its easily understood and sometimes through the analysis, some important results come up. Each activity, even if it is a service provision as such of a law firm it results in an impact on the energy. For instance in the legal firm it was a surprise by the management to realize that the second most important energy consumed in the office is from computers operation.

The above significant energy uses identification helped the firm to quantify its actions and include them in the business strategy and transform them into energy targets. This inclusion of the objectives and targets in the business strategy will help the management to integrate energy performance concern into all its' services and actions. The objectives and targets setting should involve employees and management of the business in the whole operation from the identification to the setting of targets. This will help employees to commit their actions and efforts into the implementation of the system. Management on the other hand, will provide the necessary resources and commitment (personnel or technological) to achieve the goals. Objectives should

be identified in a way they increase performance of the business and should be communicated along with the targets across the employees.

European and national legislation on energy performance provides that large enterprises procure energy audits from time to time in order to follow up their energy performance and promote ways for energy savings. It is important to state, that large enterprises usually have technical departments or they outsource for a technical support and consultancy. As such, knowledge and know how is at their reach in order to implement energy saving measures.

On the other hand, as the majority of the office buildings are used by small medium enterprises, as Stelios Americanos LLC, they lack of technical knowledge and understanding of energy data analysis in order to promote such energy savings measures. In order to deal with this lack of technical knowledge and convince Top Management, a synoptic energy audit was conducted which resulted in three scenarios. The three scenarios were with low capital investment, moderate investment and high capital intensive investment that achieved a nearly zero energy office. Those scenarios as presented in tables in the energy audit along with the expected energy saving in monetary value and simple payback period, were easily understood. The audit provided the top management a list of energy savings measures throughout the three scenarios in order to choose for implementation at the next few years.

The energy audit proposed also some soft measures (computers to shut down automatically, copy machines and printers to shut off when not used, temperatures setting to air conditioning system, night ventilation of the office etc) with no capital investment as the first steps to achieve energy savings. These measures directly connect with the employees behavior, as users of the building. These energy savings measures they need limited resources to be implemented, have immediate results in energy consumption and are easily implemented and understood. As such, they should be proposed in every energy audit for office activities and especially on small enterprises with limited and lack of technical background.

Due to the fact that soft measures must be applied by all users and the application must be consistent to have results, the organization must find ways to monitor soft measures and increase energy awareness between the employees. There is no better tool to implement and monitor energy performance measures and achieve energy savings than an energy management system.

First of all, by involving employees and management of the business to the identification and the setting of the objectives and targets will help employees to commit their actions and efforts into the implementation of the system and self-control their behavior. Management on the other hand, will not have to directly monitor the employees for their energy awareness and behavior (if they shut the lights/computers off etc). The energy management system with its inclusive approach to the personnel and the stakeholders, the team spirit enhancement to a common target of the

energy saving and the communication tactics to increase awareness of the EnMS will create the necessary culture to the organization and embed the energy performance in the everyday activities of the company.

The energy performance culture cultivation in the small medium enterprises should be the ultimate target to achieve energy performance on office buildings. In order to achieve energy performance in office buildings, the small medium enterprises as the main users of the commercial buildings, must be helped by the Legislator and the Governments' through the right incentives, to implement such tools as the energy management system, in order to gradually create the right mentality and culture for energy savings.

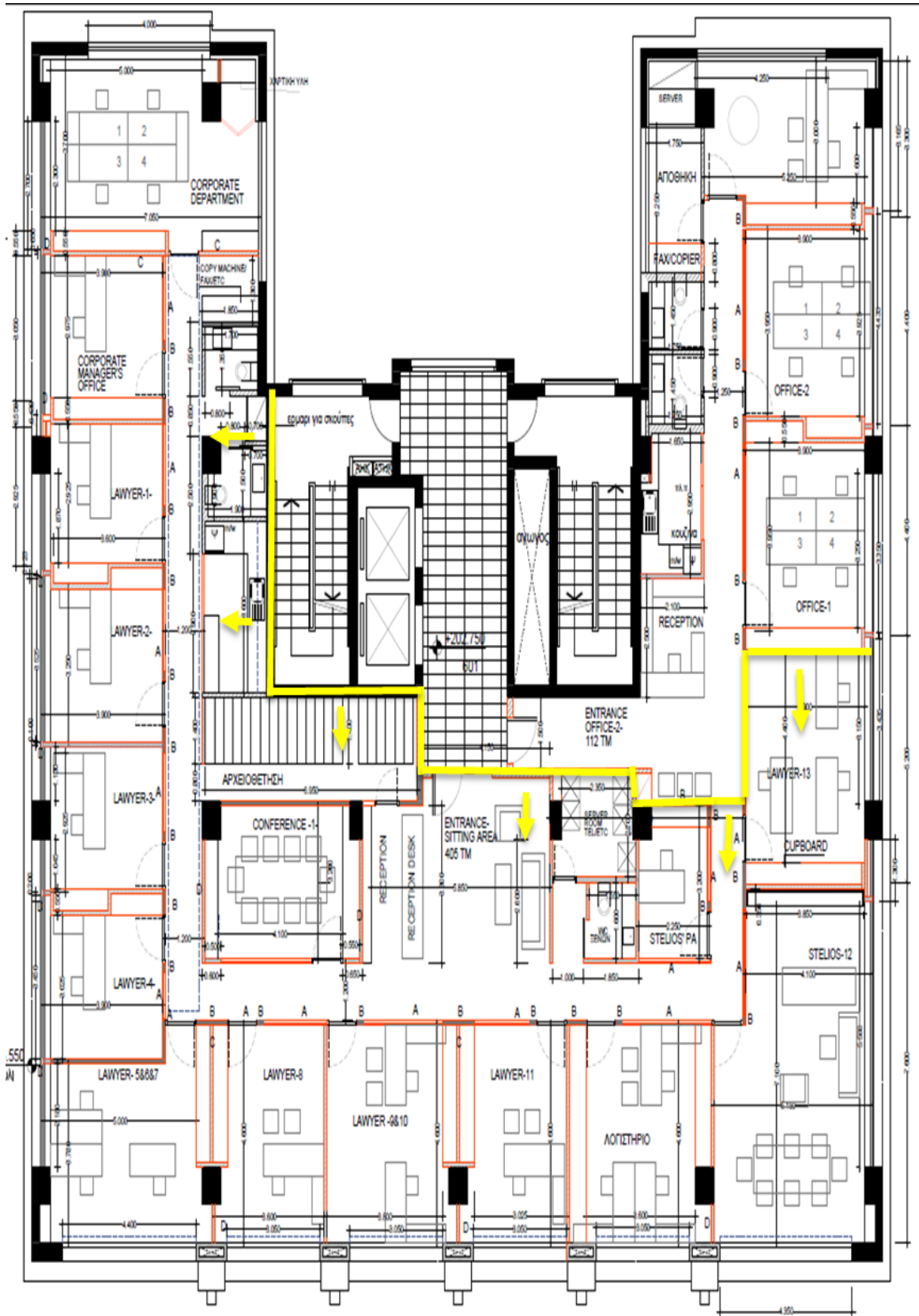
The incentives are crucial for such small medium enterprises. The energy savings achieved, even though are significant at a notion of a percentage of the energy consumption, if expressed in monetary values is around the magnitude of a few hundred Euros per year. These cost savings are not enough in order for small companies to implement energy savings measures (as they usually lack of initial capital for investment), to maintain an Energy Management System or to conduct an Energy Audit.

Due to the fact that most of the small enterprises lack of technical knowledge for energy data analysis and energy baseline construction usually they prefer to procure to external consultants the EnMS design and application which adds to the cost. Also, most of the times the system is designed in complicated ways and so further consultancy is needed to be maintained and implemented. If the business choses to conduct an energy audit to be conducted then more cost to the procedure is added. Moreover, taking into account the possibility of external certification cost then the total design, implementation and monitoring cost will be much greater than the energy savings.

To conclude, energy savings by SMEs and therefore from office buildings, in order for EU to achieve the subsequent targets of 2030 or 2050 , then design and implementation of Energy Management Systems and/or Energy Audits must be promoted through financial incentives by Government schemes or through other legislation tools in conjunction with any Governmental Schemes given right now for the energy efficiency measures.

Appendix A

Office no 602 Plan, 6th floor, system boundaries



Appendix B

Legislation regarding energy performance

Issue Year	Legislation	Information	Evidence Required to Demonstrate Compliance
2015	Energy Performance Legislation	Compliance to 2012/27/EE directive	Large organisations (>250 persons) are required to demonstrate compliance through undertaking energy audits or implementation of energy management systems. Recommendations from audits to be considered for improvement action with the aim of reducing energy consumption and improving energy performance of facilities.
2014	Streets and Buildings Law (Energy Efficiency of Buildings) (Revised) Regulations 2014	Compliance to 2010/31/EE directive	Check for consideration and application of minimum standards in new and modified buildings
2014	Regulation on Energy Efficiency of Buildings (Energy Certification of Buildings) (Revised) Regulations 2014	Energy Efficiency certificates	

2013	Regulation on Energy Efficiency of Buildings (Minimum Energy Efficiency Requirements) Decree 2013	Minimum Energy Efficiency Standards in buildings	
2013	The Regulation of the Energy Performance of Buildings (Recommendations for Improving the Energy Efficiency of a Building and the Energy Efficiency Certificate of a Building) Decree of 2013	Requirements for energy performance certificates	
2012	Regulation on Energy Efficiency of Buildings (Revised) Law 2012 N210(I)/2012	Compliance to 2010/31/EE directive	
2009	Regulation on Energy Efficiency of Buildings (Minimum Energy Efficiency Requirement of Buildings) Decree 2009	Minimum Energy Efficiency Standards in buildings	
2009	Regulation on Energy Efficiency of Buildings (Energy Efficiency Certification of Buildings) Decree 2009	Energy Efficiency certificates	
2009	Notification in accordance with Chapter 22 of the Regulation on Energy Efficiency of Buildings Laws of 2006 and 2009	compliance to 2010/31/EE directive	
2009	Regulation on Energy Efficiency of Buildings (Energy Certification of Buildings) Regulations 2009	Inspection of Mechanical instalations when undergoing installation.	

2009	Regulation on Energy Efficiency of Buildings (Revised) Law 2009 N30(I)/2009		
2016	The Regulation of Energy Efficiency of Buildings (Requirements for New Technical Building Systems Installed in Existing Buildings and Building Units, and Technical Systems of Buildings Superseded and Upgraded) Order of 2016		
2009	Regulation on Energy Efficiency of Buildings (Methodology of Energy Efficiency Calculation of Buildings) Decree 2009	Methodology for Energy Efficiency calculation	
2007	Decree of 2007 on Minimum Energy Efficiency Requirements of Buildings	It has been revised with ΚΔΠ 119//2016	It has been revised with ΚΔΠ 119//2016
2007	Decree of 2007 on the Methodology of Energy Efficiency Calculation of Buildings	It has been revised with ΚΔΠ 119//2017	It has been revised with ΚΔΠ 119//2017
2007	Notification in accordance with Chapter 22 of the Regulation on Energy Efficiency of Buildings Law of 2006	Buildings Regulations relating to requirements when building, renovating, buying, selling or renting a building.	Check building laws are complied with when building new or modified premises with regard to building standards, energy performance and selection and
2006	Streets and Buildings (Energy Efficiency of Buildings) Regulations 2006		

2016	Ο περί Ρυθμίσεως Οδών και Οικοδομών (τροποποιητικός) Νόμος του 2016		installation of mechanical and electrical systems.
2006	Regulation on Energy Efficiency of Buildings Law 2006 – N142(I)/2006		
2015	Regulation on Energy Efficiency of Buildings (Minimum Energy Efficiency Requirements) Decree 2015		
2015	περί ρύθμισης της ενεργειακής απόδοσης των κτηρίων (μεθοδολογία υπολογισμού ενεργειακής απόδοσης κτιρίου)		
2014	περί ρύθμισης της ενεργειακής απόδοσης των κτηρίων (απαιτήσεις και τεχνικά χαρακτηριστικά που πρέπει να πληροί το κτίριο με σχεδόν μηδενική κατανάλωση ενέργειας)		
2017	Ο περι ρύθμισης της ενεργειακής απόδοσης των κτηρίων (Τροποποιητικός) Νόμος του 2017		
2016	Το περί Ρύθμισης της Ενεργειακής Απόδοσης Κτιρίων (Συστάσεις για τη Βελτίωση της Ενεργειακής Απόδοσης Κτιρίου και Πιστοποιητικό Ενεργειακής Απόδοσης Κτιρίου) Τροποποιητικό Διάταγμα του 2016		

2009	Regulation on Energy Efficiency of Buildings (Inspection of Air Conditioning Systems) Decree 2009	Requires organisations to scheduling and undertake periodic inspections of air conditioning systems which have a cooling capacity greater than 12kW. The law outline requiremetns and qualifications for Inspectors certification requirements and requirements for reporting.	HVAC systems maintenance, testing and configuration records
2009	The Regulations on Energy Efficiency of Buildings (Inspection of Air Conditioning Systems) Regulations 2009		
2009	Regulation on Energy Efficiency of Buildings (Inspection of Air Conditioning Systems) Regulations 2009		
2009	Regulation on Energy Efficiency of Buildings (Inspection of Air Conditioning Systems) Decree 2009		
2017	Κανονισμοί Επιθεωρητών Συστημάτων Κλιματισμού		
2017	Κανονισμοί Επιθεωρητών Συστημάτων Κλιματισμού		
2015	περί ρύθμισης της ενεργειακής απόδοσης των κτιρίων (ρύθμιση και έλεγχος συστημάτων κλιματισμού ονομαστικής ισχύος εξόδου μεγαλύτερη των 12kW		
2011	Energy Management Systems - Requirements	Energy Efficiency Management System designed to improve the energy efficiency of company sites	Check latest certificate is available and in date

2011	Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonised conditions for the marketing of construction products and repealing Council Directive 89/106/EEC	This Regulation lays down conditions for the placing or making available on the market of construction products by establishing harmonised rules on how to express the performance of construction products in relation to their essential characteristics and on the use of CE marking on those products.	Check for specification and purchase of CE marked construction products when making changes to buildings which could affect energy performance
2016	Commission Regulation (EU) 2016/2281 of 30 November 2016 implementing Directive 2009/125/EC of the European Parliament and of the Council establishing a framework for the setting of ecodesign requirements for energy-related products, with regard to ecodesign requirements for air heating products, cooling products, high temperature process chillers and fan coil units	This Regulation establishes eco-design requirements for the placing on the market and/or putting into service of: (a) air heating products with a rated heating capacity not exceeding 1 MW; (b) cooling products and high temperature process chillers with a rated cooling capacity not exceeding 2 MW; (c) fan coil units.	Check for EU eco-design labelling when specifying and purchasing new air cooling plant in line with design specifications. Consideration of energy labelling when making purchase decisions.

2017	Amending Delegated Regulations (EU) No 1059/2010, (EU) No 1060/2010, (EU) No 1061/2010, (EU) No 1062/2010, (EU) No 626/2011, (EU) No 392/2012, (EU) No 874/2012, (EU) No 665/2013, (EU) No 811/2013, (EU) No 812/2013, (EU) No 65/2014, (EU) No 1254/2014, (EU) 2015/1094, (EU) 2015/1186 and (EU) 2015/1187 with regard to the use of tolerances in verification procedures	Regulation relating to the energy labelling of energy consuming equipment as required to be applied by equipment manufacturers	
2015	περί καθορισμού μεθοδολογίας και άλλων απαιτήσεων ενεργειακών ελέγχων διάταγμα του 2015	Guidance for the execution of the energy audits at the bank's buildings & premises	Energy Audit Reports
2014	Energy audits -- Requirements with guidance for use	Guidance for the execution of the energy audits at the bank's buildings & premises	Energy Audit Reports
2014	Energy Management Systems - Guidance for the implementation, maintenance and improvement of an energy management system	Guidance for the implementation, maintenance and improvement of the Bank's ISO 50001 system	ISO 50001 system
2011	Guidelines for auditing management systems	Guidance for the execution of the internal audits	Internal Audit Reports
2015	Οι Περί Προώθησης και Ενθάρρυνσης της Χρήσης των Ανανεώσιμων Πηγών Ενέργειας (Πιστοποίηση Εγκαταστατών Μικρής Κλίμακας Συστημάτων Ανανεώσιμων Πηγών Ενέργειας) Κανονισμοί του 2015.	Guidance for the implementation of Renewable Energy Resources Projects at the Bank DC premises	Internal Audit Reports

Appendix C

Good Management Practices

GENERAL INSTRUCTIONS FOR USE ON ENERGY SAVINGS

Lighting

Electricity consumption, in lighting, for the 6th floor is about 17% of the total energy consumed. The potential for energy savings is great as long as the following simple guidelines are followed:

- ✓ Turn off the lights at the empty offices and other spaces.
- ✓ Turn off the lights when leaving your office for a long time.
- ✓ Make the most of the natural light by adjusting the blinds on your office windows.
- ✓ Reduce the illumination intensity if not necessary. The high intensity of illumination creates eye-catching reflections.
- ✓ If you are the last person to leave the office make sure all lights are off.

The aim is to save energy without reducing the level of working conditions.

GENERAL INSTRUCTIONS FOR USE ON ENERGY SAVINGS

Heating / Air Conditioning

Electricity consumption, for heating and air conditioning, for the 6th floor is about 40% of the total energy consumed. The energy-saving margins are large as long as the following simple operating instructions are applied:

- ✓ Keep the temperature of the thermostat at 22-23 °C in winter and 26-27 °C in summer.
- ✓ Close the windows when heating/cooling equipment is operating. Ventilate the area well for 10 minutes and then turn on the heating / cooling.
- ✓ Adjust your clothing habits according to the outside temperature of the season.
- ✓ If you leave your office for a long time, turn off the heating / cooling.
- ✓ Turn off heating / cooling in places that are permanently empty.

The aim is to save energy without reducing the level of working conditions.

GENERAL INSTRUCTIONS FOR USE ON ENERGY SAVINGS

Office equipment

Electricity consumption of office equipment for the 6th floor is about 34% of the total energy consumed. The energy-saving margins are large as long as the following simple operating instructions are applied:

- ✓ Turn on power saving features on your computer.
- ✓ Always turn off monitors, computers and printers from the switch when leaving the office.
- ✓ Set the display directly to "sleep mode" when not in use.
- ✓ Only start the printer when you need to print and preferably use the printing of the copy machine which is online at the office net.

The aim is to save energy without reducing the level of working conditions.

Appendix D

Energy Audit

Synoptic Energy Audit



By George Louka

Mechanical Engineer, Energy Auditor

Nicosia, 2020

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Chapter 1

General description of the building

The building examined is a mixed use six- store commercial building with one ground floor shop with mezzanine (Ancoria Bank Ltd) and two-store underground parking. It was constructed in



Photo 1 Different views of the building

2015. It is located in Agioi Omologites area at the Municipality of Nicosia in the Demostheni Severi Avenue no.12 at the bottom of the hill of the Presidential Palace and about 1 kilometers southwest of the center of Nicosia, the capital of Cyprus.

It has a built area of 3800m². It is a modern architecture U-shaped building and its construction was completed in 2015 by Athienitis Developer Ltd. It is at the heart of the financial center of Nicosia surrounded by banks, Ministries, international companies, legal and financial services etc. The main entrance of the building and access to the floors is at the back (west side) on Kastellorizou Street where the parking is also located.

The boundary of the energy audit will be focused on the top floor (6th floor- office 602) where the headquarters of Stelios Americanos & Co LLC, a law firm established in January 2010, is located. The firm is the owner of the office and its housed there since May 2015. The owner wants to make changes that can add value to both energy savings and the firm.

The character of the area and the microclimate is shaped by the surrounding commercial buildings of the financial center of Nicosia and also the adjacent Grammiko Park which is around 500 meters at the south west of the building. At the west side at 300 meters the Pedieos river passes which most of the times (during summer) there is no water. The Grammiko Park, the elevation differences of its territory, the proximity and ease of access to the center of Nicosia, the harmonious composition of the old Nicosia with the new, and the dozens of developmental projects create a unique microclimate for the building to operate.



Photo 2 View from the top. Surrounding Areas

The building is 3,7km away (at a straight line) from Athalassa Forest where the nearest meteorological station is located. Below is the meteorological data of the area.

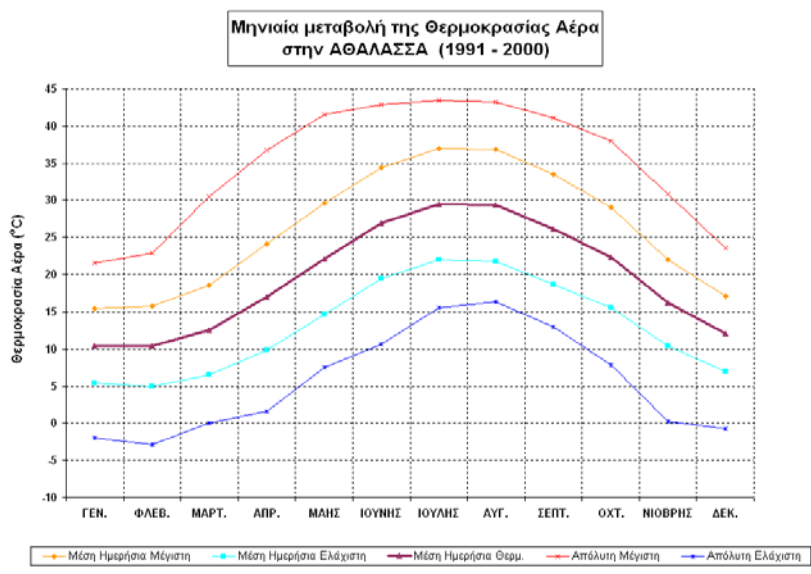


Photo 3 Average Temperature Variations from 1991 to 2000

Field Topography based on General Construction Law and Local Plan

The whole building plot is consisted by two plots the number 997 and number 992 based on the Land Registry Department database. The total plot area is 2373 m² with allowed area coverage based on general construction rules and local plan at 50% and total construction area 180% of the area of the plot. Also due to the commercial planning zone it is allowed to build up to 8 floors. The tables below were taken by the Land Registry Department.

ΓΕΝΙΚΕΣ ΠΛΗΡΟΦΟΡΙΕΣ ΤΕΜΑΧΙΟΥ: 997

ΕΠΑΡΧΙΑ	ΛΕΥΚΩΣΙΑ	ΕΜΒΑΔΟ ΤΕΜΑΧΙΟΥ (σε τ.μ)	1256
ΔΗΜΟΣ/ΚΟΙΝΟΤΗΤΑ	ΔΗΜΟΣ ΛΕΥΚΩΣΙΑΣ	ΠΕΡΙΜΕΤΡΟΣ ΤΕΜΑΧΙΟΥ	
ΕΝΟΡΙΑ	ΑΓΙΟΙ ΟΜΟΛΟΓΗΤΕΣ	ΑΞΙΑ 1.1.2018	€1,000,900.00
ΤΜΗΜΑ/ΑΡΙΘΜΟΣ ΕΓΓΡΑΦΗΣ	0/10459	ΑΞΙΑ 1.1.2013	€1,549,100.00
ΤΜΗΜΑ	01	ΑΡΙΘΜΟΣ ΤΕΜΑΧΙΟΥ	997
ΦΥΛΛΟ/ΣΧΕΔΙΟ	21/540203	ΚΛΙΜΑΚΑ	1:1000

ΠΟΛΕΟΔΟΜΙΚΗ ΖΩΝΗ	ΠΟΣΟΣΤΟ ΕΜΒΑΔΟΥ	ΔΟΜΗΣΗ	ΚΑΛΥΨΗ	ΟΡΟΦΟΙ	ΥΨΟΣ
Εβ2	50%	1.8	0.5	8	31
Κα3	50%	1.4	0.5	4	17

ΓΕΝΙΚΕΣ ΠΛΗΡΟΦΟΡΙΕΣ ΤΕΜΑΧΙΟΥ: 992

ΕΠΑΡΧΙΑ	ΛΕΥΚΩΣΙΑ	ΕΜΒΑΔΟ ΤΕΜΑΧΙΟΥ (σε τ.μ)	1117
ΔΗΜΟΣ/ΚΟΙΝΟΤΗΤΑ	ΔΗΜΟΣ ΛΕΥΚΩΣΙΑΣ	ΠΕΡΙΜΕΤΡΟΣ ΤΕΜΑΧΙΟΥ	
ΕΝΟΡΙΑ	ΑΓΙΟΙ ΟΜΟΛΟΓΗΤΕΣ	ΑΞΙΑ 1.1.2018	€6,144,900.00
ΤΜΗΜΑ/ΑΡΙΘΜΟΣ ΕΓΓΡΑΦΗΣ	0/8650	ΑΞΙΑ 1.1.2013	€2,579,300.00
ΤΜΗΜΑ	01	ΑΡΙΘΜΟΣ ΤΕΜΑΧΙΟΥ	992
ΦΥΛΛΟ/ΣΧΕΔΙΟ	21/540203	ΚΛΙΜΑΚΑ	1:1000

ΠΟΛΕΟΔΟΜΙΚΗ ΖΩΝΗ	ΠΟΣΟΣΤΟ ΕΜΒΑΔΟΥ	ΔΟΜΗΣΗ	ΚΑΛΥΨΗ	ΟΡΟΦΟΙ	ΥΨΟΣ
Εβ2	51%	1.8	0.5	8	31
Κα3	49%	1.4	0.5	4	17

Personnel, organizational structure and operating hours

The firm employs 26 persons. Four persons are the partners of the law firm and are considered as the management team. Mr. Stelios Americanos is the managing partner. It also has three lawyers as seniors' associates and 7 as associates. The corporate department is consisted by 7 persons and the accounting department by another 3. There are 4 secretaries and 1 cleaner. The organizational chart is as follows.

MANAGING PARTNER	COURT	LEGAL	CORPORATE	ACCOUNTING DEPARTMENT	SECRETARY	CLEANING
STELIOS AMERICANOS	HEAD: SOTERIS COSTA	HEAD: DESPINA AMERICANOU	HEAD: JULIANA KYRIAKIDES	HEAD: MIRANDA SYMEOU	MARIA SYMEONIDOU	MARIA NIROVA
	MORFAKIS KOUMAS	MICHALIS ZAMPYRIDES	HELEN PANTELI	STELLA MITSINGA	EUTHIMIA EUTHIMIOU	
	THANOS FKIAKAS	KYRIAKI CHRISTOFI	ANDRI MANDI	MARY SKOUROU	STYLIANA DEMETRIOU	
	CHRYSANTHI EPIFANIOU	XENIA KALOGIROU	KATERINA EFTHIVOULOU		EIRINI EVRIVIADOU	
	CHRISTOFOROS TSEKOURAS		NICOLETTA SAVVA			

	ANDREAS PARPAS		AGATA KOLONKA			
			KARINA STOLBOVSKIKH			

The office operating hours are from 8 am to 17:30 pm weekdays. Depending on the projects and coming deadlines sometimes personnel can stay up to late in the evening.

Orientation

The building is facing east (slightly to the north) at the main road of Demostheni Severi. Its main entrance for the floors is at the back (west side) where there is an over ground parking. From the west side of the building it is adjacent to a residential area so no high rise buildings are in place.



Photo 4 West side view from the ground

The east side is facing the Demostheni Severi Street which is a two way (four lanes) commercial street with high traffic during rush hours and high rise buildings 4 to 6 floors at the opposite of the road. At the south side of the building there is an adjacent 4 floor block of offices. The north side is next to another lower height building of mixed use.



Photo 5 Views form the rooftop. From left to right south side, north side and east side of the building

Characteristics of the building due to orientation, microclimate and elevation

Solar Insolation and daylight

The location of the building favors sunshine due to the large windows on the east and south sides and especially during the hot summer months. The south side is adjacent to high rise buildings that can shade the low floors of the building but the 6th floor is open at 360° with no obstacles near it. In general, the 6th floor is directly affected by the sun. The building has a lot of natural light during daylight hours due to height of the office (6th floor) the many and large windows.

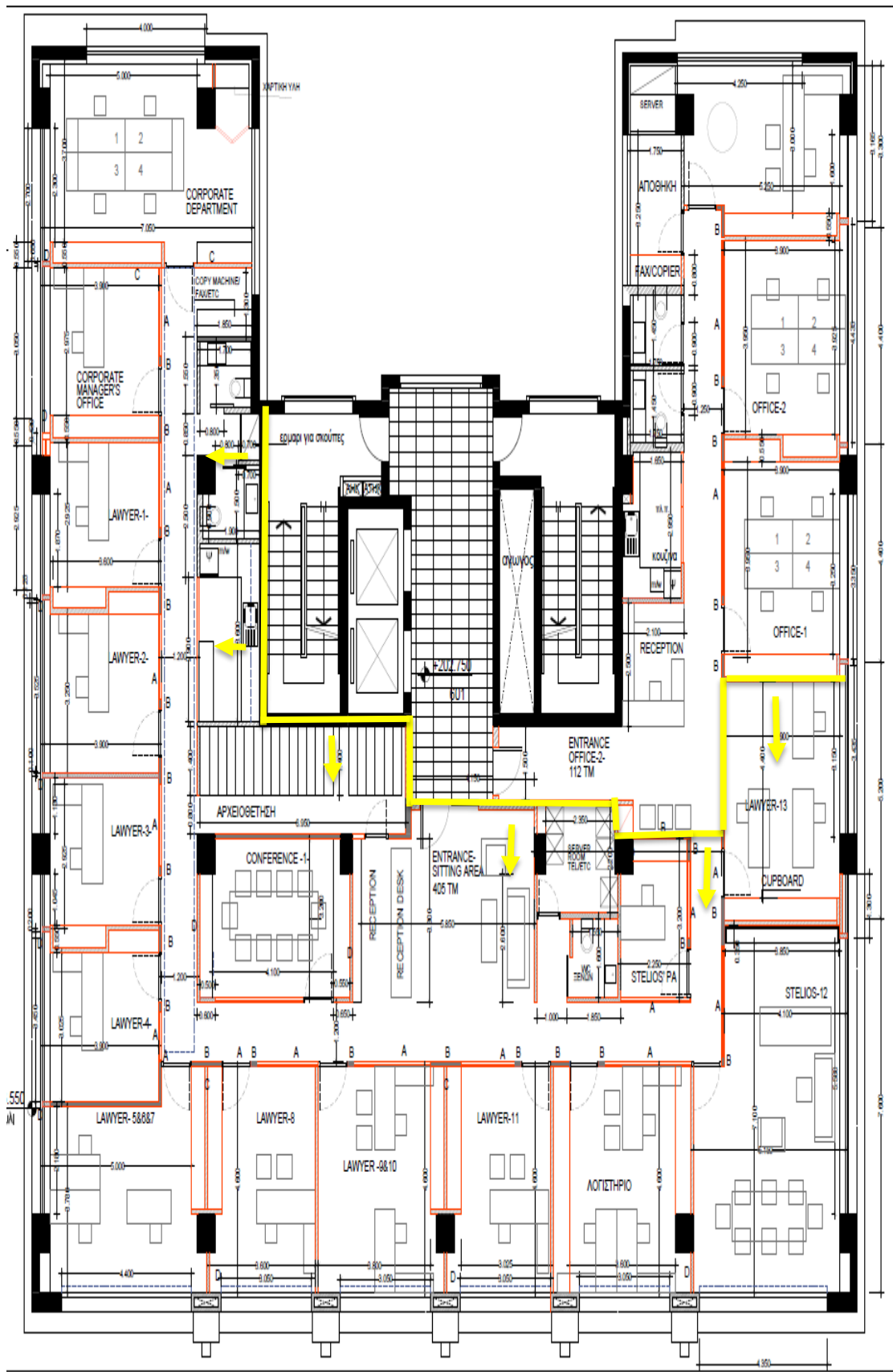
Natural Ventilation

The building has large windows that can open for ventilation. In the Nicosia area and especially in the evening hours there is a stream of air coming from the north and west side. Due to the openings of the building and since there is no presence of high rise building (parking lot and residential area) on the west side there is a good natural ventilation to the sixth floor. The same on the north side since there is no direct adjacent high rise building but low buildings.

The 6th floor plan

The sixth floor has an office area of 517 m². The examined space is office no.602 of 405m² that houses the Stelios Americanos Law LLC (marked with yellow color at the floor plan below). The floor consists of an elevator lobby, the main entrance to the office at the west side, where at the right hand side there is a reception desk and a sitting client area (at the middle of the entrance) and at the left is the server and telecommunications room. At the east side there are 4 lawyer's offices, the accounting department and the managing partner office at the north east corner around 35 m².

At the south side of the floor there are lawyer's office with the corporate managers' office and at the south west side corner and there is also an open plan office for 4 employees. At the opposite side of the corridor there is a copy machine room, a rest room and a kitchen.



Chapter 2

Building Characteristics

Exterior wall

The building is a heavy structure with reinforced concrete walls and bricks. Even though the building construction was completed in 2015, the construction license was apprehended sometime between 2007 and 2009 thus the building is not required to have any category at the energy performance certification. The energy performance certification was not located at the offices registry even though by law they were obliged to have it. During the walk through audit it was clear that the building has some thermal insulation at the walls, windows and also at the rooftop and it was taken as granted that the building was fulfilling the obligation under the Order 568/2007 (that was in place at the time of the license) hence the walls have a total U-value of 0,85 W/m²K, the rooftop a total U-value of 0,75 W/m²K and the windows a U value of 3,8 W/m²K.

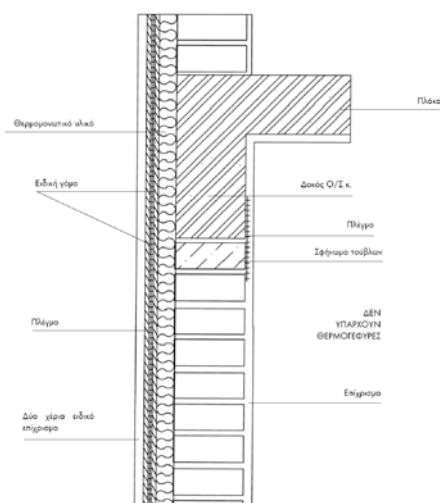


Photo 6 Typical thermal insulation of the exterior wall with alucobond

The façade is wrapped up entirely with stone tiles for the first 5 floors and alucobond at the sixth floor. There are large aluminum doubled glazed windows on all sides but we could not check for thermal bridges. Especially at the sixth floor the double glazed windows are the main feature of the exterior walls along with the alucobond. The alucobond has a mineral filled core and its heat transition coefficient is considered in the overall outer wall to be of 0,85 W/m²K.

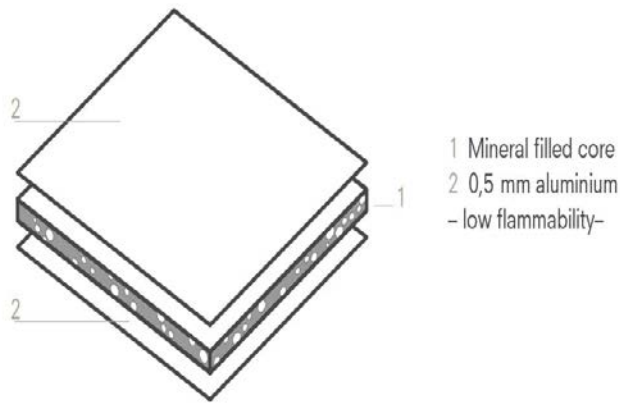


Photo 7 Alucobond Structure

Windows

At the 602 office there are double glazed reclining windows with 1,2 m height and an estimated U value of 3,8 W/m²K. In total there are at the west side 4,8m² (1,2mX4m), at the south side 20,4 m² (17mX1,2m), at the east side 24m² (1,2mX20m) and at the north side 9,6 m² (1,2m X 9m).



Photo 8 Reclining windows of the sixth floor and a view of the inside of the window

Above the windows there is an architectural ledge of a width of around 30cm surrounding the building that can offer some shade at the south side. Also, the windows have a low emissivity coating reflecting heat. Of course, this reduces the natural sunlight increasing the needs for artificial lighting. There is no other external shading system to the windows but on the other hand there is internal shading curtains.

Rooftop

The rooftop has xps extruded polystyrene insulation and above that there is screed. It has an estimated total U value of 0,75W/m²K. Above the asphalt coating (water insulation) there is a layer of white gravels to protect from UV radiation and hail.

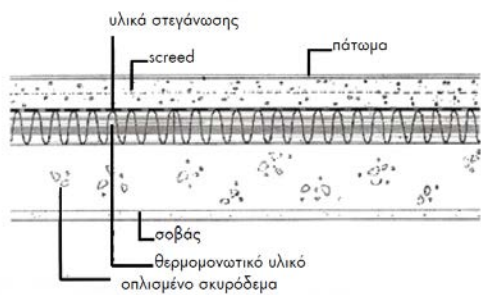


Photo 9 Typical thermal insulation of rooftop and photo of gravels

Heating / Air-conditioning and ventilation

The space heating and cooling of the offices is conducted through a variable refrigerant flow (VRF) system with indoor units. There is also a heat recovery system (HRV) system for all offices with direct expansion (DX) coil (connected with the VRV for heat recovery) for ventilation purposes. For the server's room there two wall type split units installed. All systems run on electricity which is the only type of energy consumed on the premises.



Photo 10 Outdoor VRV and Split Units. Air- conditioning and ventilation louvers of the concealed indoor units

Specifically, heating and air-conditioning of the office area is conducted through a 3 outdoor inverter units of variable refrigerant flow (VRF) system of cooling capacity of 45 kW, 28 kW and 14 kW respectively (Annex 1). The offices and common spaces are using indoor units of ceiling concealed types (ducted) mostly with a capacity of 4,5kW. The following table shows the outdoor and indoor air-conditioning equipment, its cooling capacity and its input power.

VRV SYSTEM - DAIKIN						
NEW REF	TYPE	MODEL	CAPACITY	POWER	RUNNING	STARTING
			(KW)	INPUT (KW)	CURRENT (A)	CURRENT (A)
O.U. 6.1	HEATPUMP	RXYQ16T	45	13	21,3	85
I.U. 6.1.1	CEILING CONCEALED	FXSQ63P9	7,1	0,074	1,1	
I.U. 6.1.2	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.3	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.4	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.5	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.6	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.7	CEILING CONCEALED	FXSQ63P9	7,1	0,074	1,1	
I.U. 6.1.8	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.9	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.10	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.1.11	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
O.U. 6.2	HEATPUMP	RXYQ10T	28	7,29	11,3	74
I.U. 6.2.1	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.2.2	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.2.3	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.2.4	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.2.5	CEILING CONCEALED	FXSQ50P9	5,6	0,097	1,2	
I.U. 6.2.6	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
O.U. 6.3	HEATPUMP	RXYQ5P9	14	3,52	5,1	7,79
I.U. 6.3.1	CEILING CONCEALED	FXSQ40P9	4,5	0,097	1,2	
I.U. 6.3.2	CEILING CONCEALED	FXSQ40P9	4,5	0,053		
I.U. 6.3.3	CEILING CONCEALED	FXSQ40P9	4,5	0,053		
I.U. 6.3.4	CEILING CONCEALED	FXSQ40P9	4,5	0,053		
SPLIT UNITS DAIKIN						
NEW REF	TYPE	MODEL	CAPACITY	POWER	RUNNING	STARTING
			(KW)	INPUT (KW)	CURRENT (A)	CURRENT (A)
S.U. Server 1	WALL TYPE	FTX25JV/RX25JV	2,5	0,44	1,83	Inverter
S.U. Server 2	WALL TYPE	FTX25JV/RX25JV	2,5	0,44	1,83	Inverter

The ventilation of the office is conducted through a heat reclaim ventilation system with a direct expansion coil connected to the VRF system. The input power of the systems are shown at the table below.

REF	TYPE	MODEL	EFFICIENCY (Lt/s - Pa)			POWER
			LOW SPD	HIGH SPD	ULTRA HIGH SPD	INPUT (KW)
HRV 6.1	DAIKIN	VAM1000FB			280-157	0,38
HRV 6.2	DAIKIN	VAM1000FB			280-157	0,38
HRV 6.3	DAIKIN	VAM500FB			140-98	0,18

Lighting fixtures

The lightings fixtures of the floor are mainly linear led strips ceiling suspended fixtures of 50 W each. Two linear ceiling suspended led light are installed in each office (also at the kitchen,

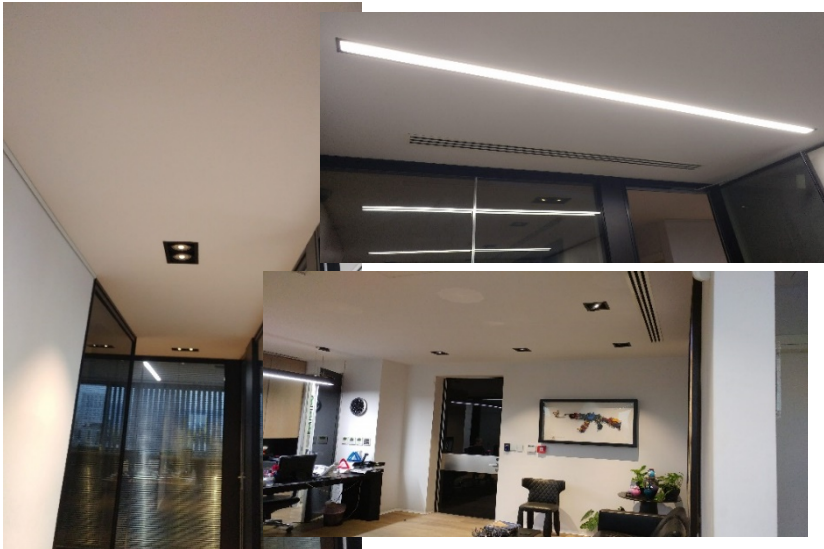


Photo 11 *Lighting fixtures of the 6th floor*

reception meeting rooms, archive room) up to a total number of 54 lighting fixtures. At the common space, corridors, rest rooms etc there are spotlights with double or single led lights of 12W each. The installed number of the spotlights led is total 82 units.,

Office equipment

The office has also other equipment that consume electricity. There are 26 desktop computers with screens and printers. There two copy machines. There is also kitchen with a refrigerator, a microwave, a dishwasher and two coffee machines. The access to the two servers was not allowed.



Photo 12 *Other equipment*

Desktop and personal computers power input was estimated at 300 W, servers at 600 W per hour and printers at 150W. The toilet ventilation was estimated at 30W each (4 toilet fans) and a 2,2 kW water heater per toilet. The kitchen equipment such as refrigerator, dish washer, coffee machine was estimated at 1,5 kW. More details can be found at the energy balance table below.

Chapter 3

Electricity Data Analysis

The electricity is consumed mainly for the cooling and heating of the offices through outdoor variable refrigerant flow units (VRF) and indoor units for each office. Secondly, electricity consumption also comes from the lighting fixtures of the offices. Last but not least, office equipment such as desktop computers, printers, scanners and photocopy machines are equally a major electricity consumption.

The company has proceeded with the identification and recording of the operations and activities of the business that consume the most. In particular, electricity consumption includes activities such as the operation of offices, administration, management and client service.

The electricity consumption data were collected from Mrs. Miranda Simeou (Accounting Department), through bimonthly electricity bills of the Electricity Authority of Cyprus. The data are from the period of 28/5/2015 up to 27/1/2020 and are presented at the table below.

Electricity Bills Data from 28/5/2015-27/1/2020

Start Date	End Date	Cost of Electricity	Consumption kWh	Net Working Days excluding holidays	Consumption per working day in kWh
28/5/2015	23/7/2015	1.390,86 €	7621	40	191
24/7/2015	23/9/2015	1.458,28 €	7266	44	165
24/9/2015	24/11/2015	679,32 €	3636	42	87
25/11/2015	27/1/2016	1.090,71 €	6185	42	147
28/1/2016	24/3/2016	974,85 €	6068	40	152
25/3/2016	26/5/2016	729,59 €	4741	40	119
27/5/2016	25/7/2016	1.293,62 €	8321	41	203
26/7/2016	23/9/2016	1.471,02 €	8631	43	201
24/9/2016	23/11/2016	868,15 €	4968	42	118
24/11/2016	25/1/2017	1.406,89 €	7785	42	185

26/1/2017	23/3/2017	1.286,32 €	6308	40	158
24/3/2017	24/5/2017	1.072,08 €	5396	40	135
25/5/2017	25/7/2017	1.633,92 €	8496	43	198
26/7/2017	25/9/2017	1.851,96 €	9686	43	225
26/9/2017	23/11/2017	975,56 €	5490	43	128
24/11/2017	24/1/2018	1.232,74 €	6890	40	172
25/1/2018	22/3/2018	835,83 €	4505	40	113
23/3/2018	23/5/2018	1.279,59 €	6744	40	169
24/5/2018	23/7/2018	1.423,97 €	7163	42	171
24/7/2018	24/9/2018	2.018,53 €	9182	44	209
25/9/2018	22/11/2018	1.248,06 €	5480	42	130
23/11/2018	23/1/2019	1.644,97 €	7116	39	182
24/1/2019	27/3/2019	1.085,71 €	5159	43	120
28/3/2019	24/5/2019	1.099,95 €	5255	37	142
25/5/2019	23/7/2019	1.740,21 €	7874	41	192
24/7/2019	24/9/2019	1.787,85 €	8307	44	189
25/9/2019	25/11/2019	1.144,72 €	5044	43	117
26/11/2019	27/1/2020	1.562,62 €	6981	40	175
	Total	36.287,88 €	186298	1160	

Based on the electricity bills the following analysis was conducted and presented at the following table. Some important data is the average cost of electricity which is 0,195 Euro per kWh as it a commercial tariff number 15. The average consumption of electricity per working day is 161kWh with an average cost per day at 31,28 Euros. The average consumption per employee/working day is 6,2 kWh. Average consumption per year is 40400 kWh with 7900 Euro cost per year.

Usefull Data Analysis of electricity consumed		
Total consumption from 28/5/2015-27/1/2020	186298	kWh

Total cost of electricity from 28/5/2015-27/1/2020	36.287,88	€
Average consumption per year	40400	kWh
Average cost per year	7900	€
Average cost per kWh	0,195	€
Average consumption per working day	161	kWh
Average electricity cost per day	31,30	€
Average Consumption/employee/ working day	6,2	kWh
Average cost in electricity per employee/day	1,20	€
Base load Electricity Bimonthly Consumed approx.	4900	kWh

Heating and Cooling Electricity Consumption Analysis

At the absence of independence metering for heating/ cooling, office equipment and lighting consumption we can conduct the following analysis and have some useful conclusions. At the following graph it is presented schematically the electricity consumption per year from 2015. The year 2017 seems to be the most energy intensive year coming to a peak at 4th bimonthly of July and August were the air conditioning is working. All year's peak their consumption during summer time as air conditioning is working at peak load. During April –May and October–November we have the lowest consumption as no heating and air conditioning is needed.

Due to the weather neutrality of April /May and October/ November where heating and cooling

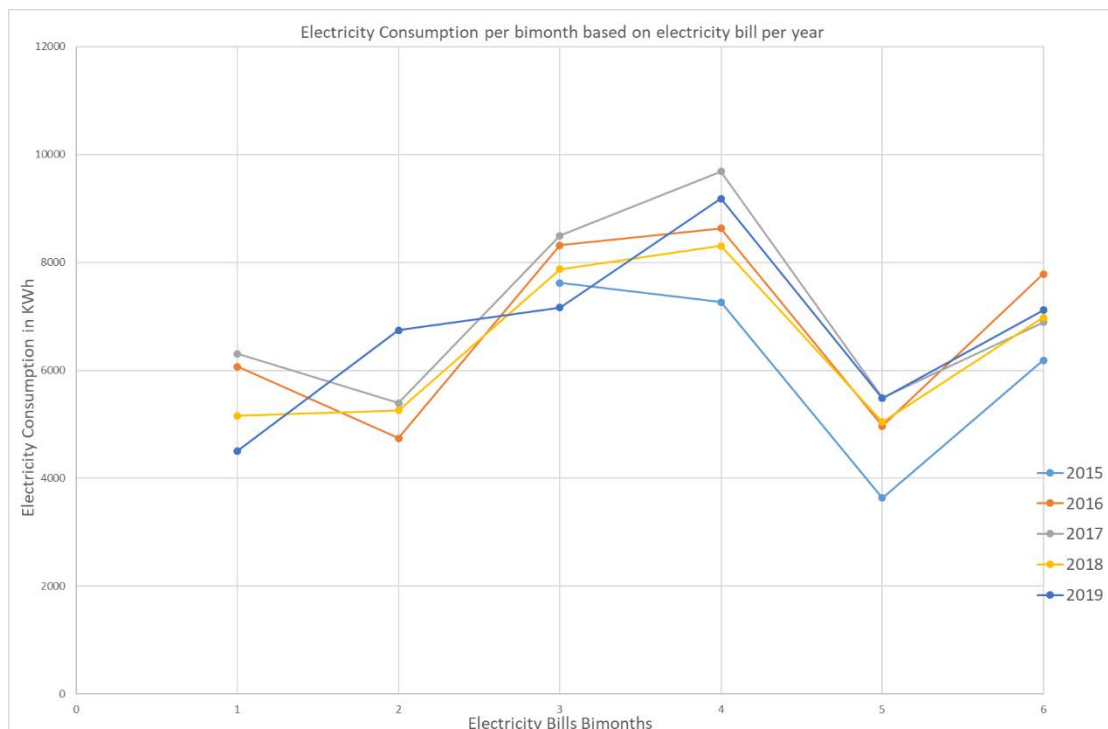


Photo 13 electricity consumption per year presented in 6 bimonthly period starting from end of January

is not necessary needed, we can check and predict the base load of the office. During those two above mentioned periods the consumption is around 4900 kWh. This means that all other electricity consumption (excluded the cooling and heating as are not so intensively used in that period) thus the lighting, ventilation, computers and other equipment such as refrigerators, copy machines, servers are responsible for consuming around the 85% of the 4900 kWh. The percentage of 85% was used (assumption) because some of air conditioning is used during May and also some heating is used during November. Thus around 4165kWh per bimonthly are consumed from other equipment than VRF for heating and cooling. At an average of 42 working days per bimonthly this means that $4165/42=99$ kWh per day. At an average consumption of 161 kWh per day the base load is the 99 kWh, thus the $99/161\approx 60\%$.

The above calculation leads us to the conclusion that heating and cooling is responsible for 40% of total year consumption meaning of 16150kWh and with a cost of 3150 euros per year.

Individual analysis per equipment

Based on the above assumptions, all other equipment along with lighting consume 99kWh per day thus 24240 kWh per year and total of 4750 euros per year. Furthermore, in the absence of individual metering and analysis per equipment, an individual calculation was conducted in order to assume the consumption percentage of each energy intensive equipment and it is presented in the following table named “Energy Balance”.

For each equipment a load factor was assumed. For air conditioning and heating the load factor was assumed at 33% because as the units are inverters they are not working at their full capacity but depend on demand. Lighting, hot water installations it was assumed a loading factor at 100%. Office equipment is considered at a loading factor depending on processing demand capacity at 75%.

Furthermore, an operation hours’ factor was assumed for each and every one equipment that corresponds to the time where the equipment is in use. It represents the time that each equipment operates. The office working hours are calculated to be around 2016 hours per year. As such, lighting is assumed to work at 90% of the office working hours, the heating and air-conditioning operate at 70% of office working hours, desktop at 90%, printers/fax machines/copy machines at 10%. Also ventilation at the rest room are considered working 10% of the office hours. For the servers the operation time was assumed 130% more than the 2016 office hours because they operate long after the closing hours for back up purposes and serving email.

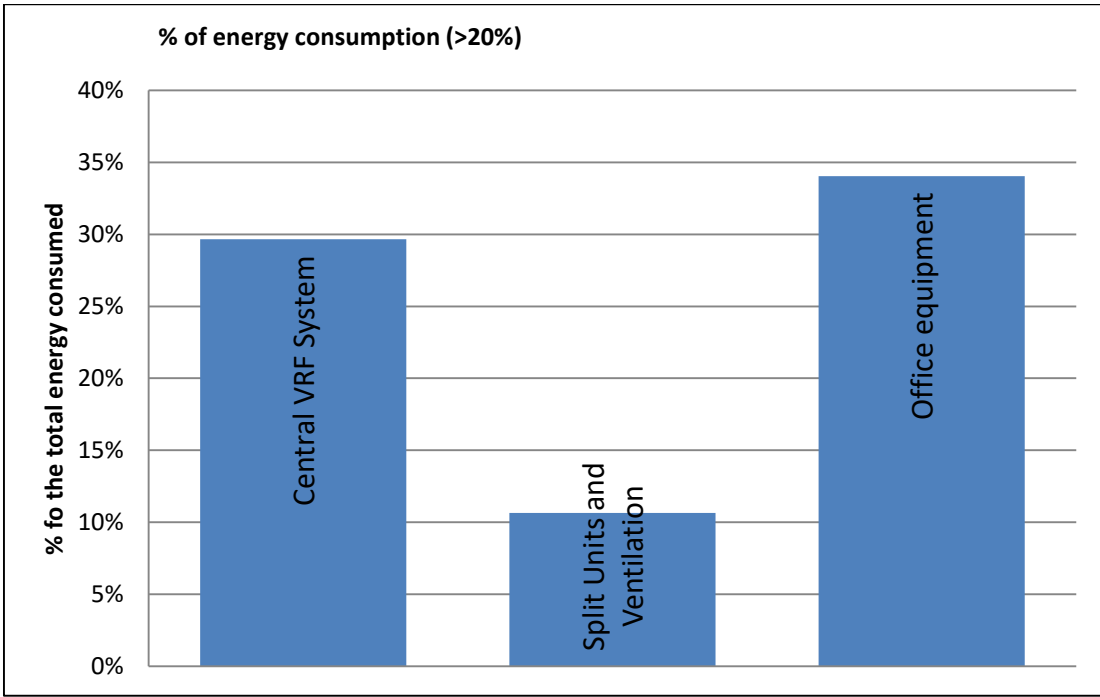
Energy Balance and energy consumption per equipment/installtion

Electricity Consumption Equipment	Quantity	Capacity (kW)	Total Capacity (kW)	Available operation hours per annum (hrs)	Load Factor (%)	Percentage of hours operation (operation coefficient) (%)	Estimated yearly consumption (kWh/yr)	% of the total consumption	Total Cost per year
Central VRF System							11954	30%	2.331 €
- Total Outdoor of 3 Units	1	23,81	23,81	2016	33%	70%	11088	28%	
- Total Indoor Units	1	1,86	1,86	2016	33%	70%	866	2%	
Split Units and Ventilation							4292	11%	837 €
- Server room	2	0,44	0,88	8760	50%	100%	3854	10%	
- Ventilation	1	0,94	0,94	2016	33%	70%	438	1%	
Lighting							6684	17%	1.303 €
- Recessed LED linear	54	0,050	2,70	2016	100%	90%	4899	12%	

- Recessed LED spotlights	82	0,012	0,98	2016	100%	90%	1785	4%		
Cold and hot water installations							1008	3%	197 €	
- Water pressure pump	1	0,60	0,60	2016	100%	10%	121	0%		
- Water heater Rest room 1	1	2,2	2,20	2016	100%	10%	444	1%		
- Water heater Rest room 2	1	2,2	2,20	2016	100%	10%	444	1%		
Office equipment							13721	34%	2.676 €	
- DESKTOP	26	0,30	7,80	2016	75%	90%	10614	26%		
- SERVER	2	0,60	1,20	2016	75%	130%	2359	6%		
- PRINTER	26	0,15	3,90	2016	75%	10%	590	1%		
- COPY MACHINE	2	0,50	1,00	2016	75%	10%	151	0%		
- FAX MACHINE	1	0,05	0,05	2016	75%	10%	8	0%		
Others							2652	7%	517 €	
- Toilet Ventilation	2	0,03	0,06	2016	100%	10%	12	0%		
- Toilet Ventilation 2	2	0,03	0,06	2016	100%	10%	12	0%		
- Refrigerator/ Coffee Machine/ Dishwasher etc	1	1,50	1,50	8760	50%	40%	2628	7%		
							total	40312	100%	7.861 €

Based on the above analysis and calculations the conclusions are that heating/air conditioning is responsible for the 40-41% of the total year consumption. Lighting is responsible for the 17% and office equipment at around 34-35 %. Other equipment such as toilet ventilation and kitchen equipment accounts at 7%. The total cost of the above calculation is around 7861 Euros and a total consumption of 40312 which is approximately the same (40400) as the total consumption based on the four-year consumption average.

The following graph summarizes the conclusions.



Chapter 4 Scenarios to Increase Efficiency and reduce energy consumption

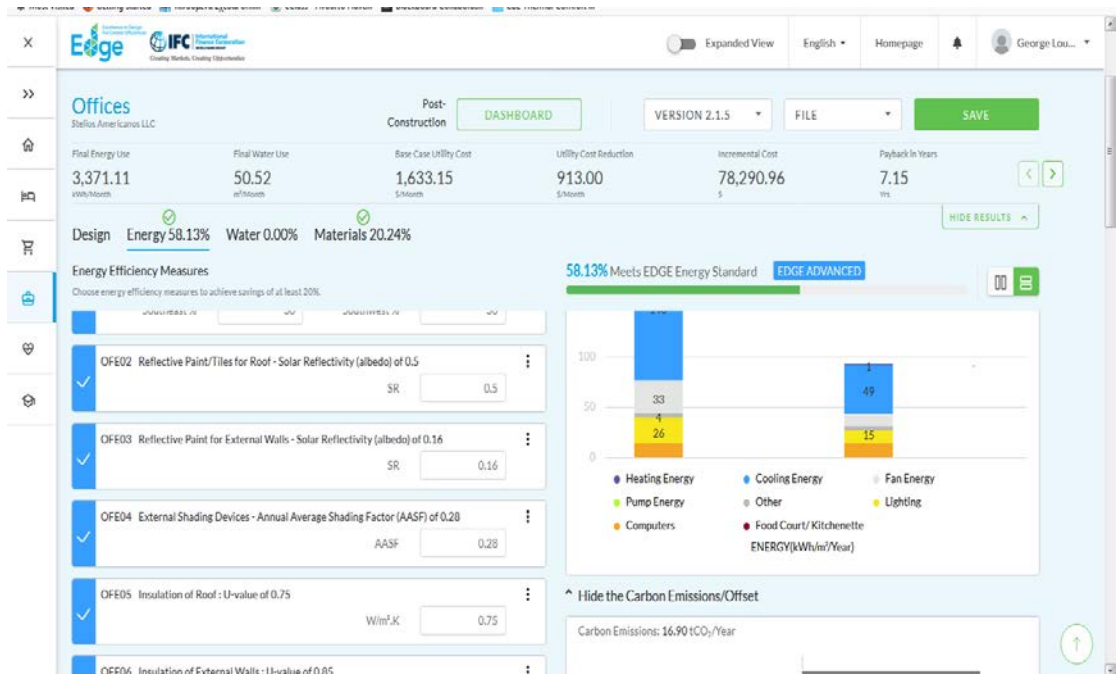
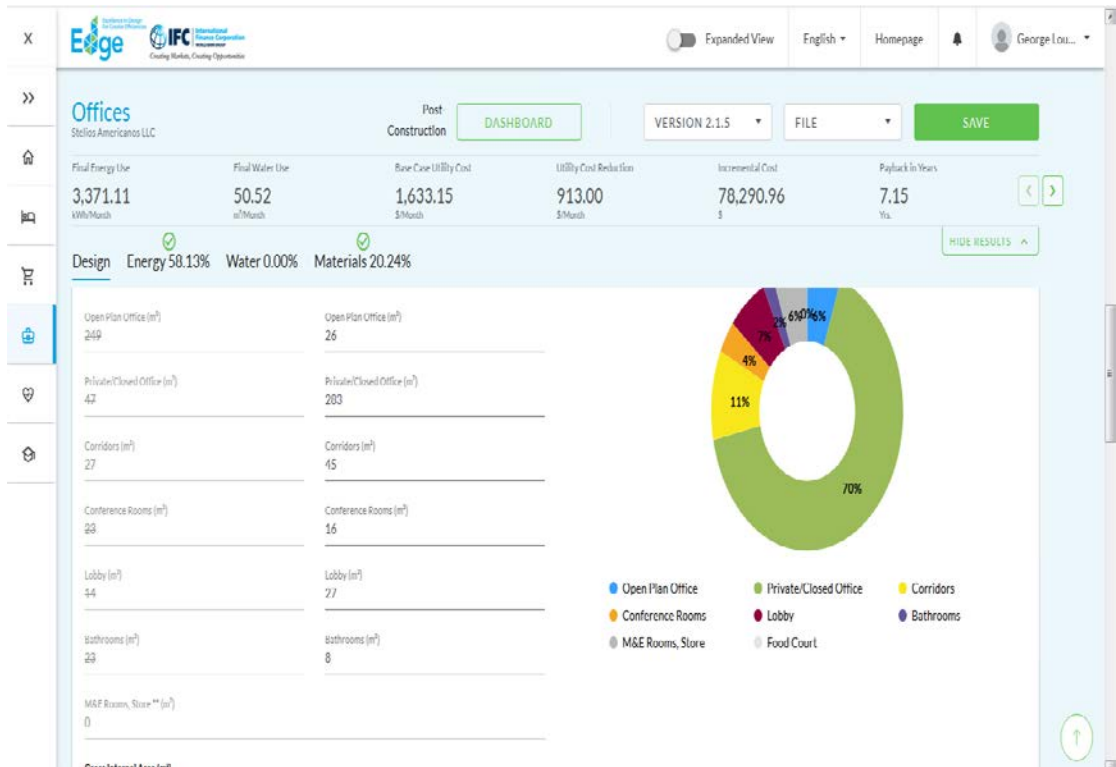
In this chapter we are going to examine three scenarios regarding the implementation of proposed energy reduction measures. The scenarios will be a low, moderate and high capital expenditure scenario. In order to define energy efficiency and reduction in the electricity consumed we used the edgebuildings software which is freely available at www.edgebuildings.com to calculate for energy savings in heating/cooling, windows, external walls, fans, sensors at the restrooms/corridors and general where there was a possibility to use the software in order to calculate energy savings it was used. In all other cases the excel file "Energy Balance" it was used to calculate potential energy savings.

Using the software, we proceeded to insert the data for the design of the building (u-value external walls, windows, rooftop etc) and the equipment efficiency (VRV units). As the software already contains algorithms and data for a base case scenario for presumably each country, due to the buildings specificities that were in place during the year of construction and also due to the fact there is a high possibility that Cyprus is not included in detail in the database, the base case key assumptions were differentiated in order to mirror the correct building specifics. Due to the above, the edgebuilding software was only used to implement some of the energy efficiency measures and to calculate the new electricity consumption for each of the low, moderate and high capital expenditure scenario.

For each scenario based on the expected electricity savings, the cost of the savings was calculated at 0,195 Euro/kWh and the simple payback (cost of investment/cost of saving) period of the capital expenditure was calculated for each measure but also in total. The Environmental Evaluation was calculated based on a carbon footprint of 1,21 kg CO₂ per kWh of electricity savings.

Base Case due to the EdgeBuildings Software

By entering all the data of the building envelope, orientation, equipment efficiency etc the final energy use was calculated at 3371 kWh/month which is approximately the same calculation we had at the energy balance table above at the individual analysis per equipment in chapter 3 and is approximately the average consumption of the office per month. The following print screens are the scenario build on the software. At the annex 2 the report of the software is attached.



Low capital expenditure Scenario

The following table shows the energy measures considered in the low capital expenditure scenario. The measures at the first table have low capital investment and on the second table below are some additional soft measures with no capital expenditure and depend on the employee's behavior. Such measures are temperature settings on the air-conditioning units for winter or summer and the computers to automatically turn off during idle time.

Energy Efficiency Measures	Energy Savings kWh per month	Energy Savings kWh per year	Energy Savings as % of Total consumption per year	Energy Savings in Euro per year @0,195Euro/kWh	Capital Expenditure	Payback period in years	Environmental Evaluation Avoidance in CO ₂ kg
Occupancy sensors in bathrooms, conference rooms*	155.85	1870.2	4.63%	€ 364.69	€ 500	1.37	2263
Occupancy Sensors in Open Offices *	45.67	548.04	1.36%	€ 106.87	€ 200	1.87	663
Recessed spot led from 12 W change led to 6W at 82 units	74	892	2.21%	€ 173.94	€ 410	2.36	1079
External Shading Devices - Annual Average Shading Factor (AASF) of 0.5	208	2496	6.18%	€ 486.72	€ 3,600	7.40	3020
Insulation of Roof : U-value of 0.4	45	540	1.34%	€ 105.30	€ 4,050	38.46	653
Ceiling Fans for Office Spaces	212	2544	6.30%	€ 496.08	€ 3,200	6.45	3078
Total	740.85	8890.24	22.01%	€ 1,733.60	€ 11,960	6.90	10757

Temperature Setting of VRF at 26C° during summer **	150	1800	4.46%	€ 351.00	€ 0	0.00	2178
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Temperature Setting of VRF at 22C° during winter**	150	1800	4.46%	€ 351.00	€ 0	0.00	2178
Set Desktops to turn off after 15 minutes of idle time**	200	2400	5.94%	€ 468.00	€ 0	0.00	2904
Total	500	6000	14.85%	€ 1,170.00	€ 0	0	7260
* Energy Savings as per edgebuildings software							
** Energy Savings per excel Energy Balance assumptions							
Total of the soft measures and costly measures	1240.9	14890.24	36.86%	€ 2,903.60	€ 11,960	4.12	18017

As energy efficiency measures for the low capital intensive scenario it was suggested to install:

Occupancy sensors in various common rooms, restrooms, kitchenette etc. The capital expenditure plus installation it was estimated at 700 Euros and based on the edgebuilding software the energy saving it was calculated at overall 6% which is around 470 Euros per year. The payback period is expected to be around 1,3 to 1,8 years.

Change of the lighting fixtures of led (downlights) at the corridors from 12W per led to 6 W. It was estimated at 5 euros per lamp including installation. At 82 pieces this comes to 410 euros. The saving is 2,21 % of total energy consumption with a total payback period of $410/173.36=2.36$ years. The low savings is because we already have low W due to led lamps that are used.

External shading devices using the edgebuilding software, install external shading at the east (vertical) and south (horizontal) side of the building and the annual averaging shading factor from 0,28 to be raised at 0,4. The savings as a percentage of total energy consumption per year is around 6%. The total capital expenditure for those is estimated at 100 euros per meter so the total capital expenditure is 3600 euros with a total payback period at 7.4 years.

Ceiling fans installation is estimated at 200 euros per office so the total expenditure is 3200 euros. The savings as a % of the total consumption is around 6% thus the payback period is 6.45 years.

Last but not least it is estimated to also to install rooftop insulation further to 7 cm xps polysterine and have a final u value of 0,45. The expenditure was estimated at 10 euros per m² so the total would be 4050 euros. The savings are very little as there is 1,4 % reduction in total consumption and this is because the roof already has an insulation and a u value of 0,75. The payback period is high at 38 years. Is a measure that is can be avoided after discussions with the owner.

In this scenario we also included soft measures that have no cost but they depend on the user's attitude. The two most important measures are to lock the temperatures of the air conditioning units at 26 C° during summer days and 22 C° during winter days. This will reduce the operating hours of the VRF units as it will need less time to bring the office at the requested temperature. This simple measure will have a significant impact of 4,46% energy saving at the total consumption per year. Another important measure that has no cost is to set the computers desktops to hibernate after 15 minutes of idle time. This will also have an impact on energy consumption as the computers operating hours are reduced and the total energy savings is 5,94%.

The low expenditure scenario overall has 11960 Euros expenditure with a total energy saving at 22% and a payback period at 6.9 years and a CO₂ equivalent avoidance is 10757 kg (1,21 kg per kWh). If we include also the soft measures that have to do with the user's attitude then this scenario has an additional 14.85% energy saving.

Moderate capital expenditure Scenario

The following table shows the energy measures considered in the moderate capital expenditure scenario. The measures included in this scenario is the ones in the low capital expenditure scenario plus measures included in this scenario (in green colour). The additional measures to include in this scenario are occupancy sensors in each office, variable frequency drives for the air handling unit, buy new office equipment (new laptops for each employee) and installation of a 10 kW PV system.

Energy Efficiency Measures	Energy Savings kWh per month	Energy Savings kWh per year	Energy Savings as % of Total consumption per year	Energy Savings in Euro per year @0,195Euro/kWh	Capital Expenditure	Payback period in years	Environmental Evaluation Avoidance in CO ₂ kg
Occupancy sensors in bathrooms, conference rooms*	155.85	1870.2	4.63%	€ 364.69	€ 500	1.37	2263
Occupancy Sensors in Open Offices *	45.67	548.04	1.36%	€ 106.87	€ 200	1.87	663
Recessed spot led from 12 W change led to 6W at 82 units	74	892	2.21%	€ 173.94	€ 410	2.36	1079
External Shading Devices - Annual Average Shading Factor (AASF) of 0.5*	208	2496	6.18%	€ 486.72	€ 3,600	7.40	3020
Insulation of Roof : U-value of 0.4 *	45	540	1.34%	€ 105.30	€ 4,050	38.46	653
Ceiling Fans for Office Spaces *	212	2544	6.30%	€ 496.08	€ 3,200	6.45	3078
Occupancy sensors in all offices**	90	1080	2.67%	€ 210.60	€ 1,500	7.12	1307
Variable frequency drives for the air handling unit*	155	1860	4.60%	€ 362.70	€ 1,000	2.76	2251
New laptops**	440	5280	13.07%	€ 1,029.60	€ 26,000	25.25	6389
10kW PV system install at the rooftop**	1250	15000	37.13%	€ 2,925.00	€ 14,000	4.79	18150
Total	2675.9	32110.24	79.48%	€ 6,261.50	€ 54,460	8.70	38853
Temperature Setting of VRF at 26C° during summer **	150	1800	4.46%	€ 351.00	€ 0	0.00	2178

Temperature Setting of VRF at 22C° during winter**	150	1800	4.46%	€ 351.00	€ 0	0.00	2178
Set Desktops to turn off after 15 minutes of idle time**	100	1200	2.97%	€ 234.00	€ 0	0.00	1452
Total of the soft measures	400	4800	11.88%	€ 936.00	€ 0	0	5808
* Energy Savings as per edgebuildings software							
** Energy Savings per excel Energy Balance assumptions							

Total of the soft measures and moderate measures	3075.9	36910.24	91.36%	€ 7,197.50	€ 54,460	7.57	44661
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As mentioned above the following measures are included in the moderate scenario:

In all 16 offices occupancy sensors are installed at a cost of 1500 Euros. The energy savings is at 2,67%. The payback period is at 7,12 years at this individual measure. Energy saving was calculated through the excel file “Energy Balance” and assumed that this will reduce the operating hours of lighting from 90% to 70% thus having 90kWh saving per month.

Another measure to introduce are variable frequency drivers for the Air Handling Unit. Based on the edgebuilding software we expect 155kWh coming to 4,60% energy savings per year. The capital expenditure is expected around 1000 euros and a payback period of 2,76 years.

Third measure, based on previous analysis the office equipment is consuming around 30-35% of total electricity consumption, we assume the purchasing of energy star laptops for all personnel. Desktops and screens consume around 300 Watt per hour and new laptop consume around 150 Watt per hour. This will achieve energy savings of 13% per year of the total energy consumption. On the other hand, the capital expenditure is very high at 1000 Euro per laptop thus a very high payback period of 25 years.

Due to the above energy saving measure there is also a change at the soft measure from setting desktops to setting laptops to hibernate every 15 minutes of idle time. This will reduce operating time from 90% to 70% and have an additional 2,97% energy saving.

Last but one of the most promising energy savings measures is to install a 10kW Photovoltaic system which is the most capacity allowed by legislation. The cost is around 14 000 Euros and will produce approximately 15000 kWh. It is not actually a saving measure as the consumption will continue to be the same but we will produce the corresponding electricity. The payback period of the system is 4,79 years.

Overall, the moderate scenario will cost 54 460 Euros and will have a payback period 8,7 years excluding the soft measures. The energy saving on this scenario is at 79,48%. If we add also the soft measures it will come to a total of 91% of energy savings and a 7,57 payback period. The overall CO₂ equivalent avoidance is 44661 kg.

High capital expenditure Scenario (Nearly Zero Energy Scenario)

At the high capital expenditure scenario, we included all the measures taken at the above two scenarios plus a full-scale renovation of the office in order to achieve a nearly zero energy building. The new additional measures are presented in blue. This will include all external walls insulation from a U value of 0.85 to a value of 0,4, change of all the double glazing windows in order to install thermal break low-e and low u value windows of 1,9 W/mK and last but not least change the heating and cooling system VRF to a more efficient system of a higher COP. The following table presents the analysis and the results. All estimations on energy savings are based on the calculations of the edgebuildings software.

Energy Efficiency Measures	Energy Savings kWh per month	Energy Savings kWh per year	Energy Savings as % of Total consumption per year	Energy Savings in Euro per year @0,195Euro/kWh	Capital Expenditure	Payback period in years	Environmental Evaluation Avoidance in CO ₂ kg
Occupancy sensors in bathrooms, conference rooms*	155.85	1870.2	4.63%	€ 364.69	€ 500	1.37	2263
Occupancy Sensors in Open Offices *	45.67	548.04	1.36%	€ 106.87	€ 200	1.87	663
Recessed spot leds from 12 W change leds to 6W at 82 units	74	892	2.21%	€ 173.94	€ 410	2.36	1079
External Shading Devices - Annual Average Shading Factor (AASF) of 0.5*	208	2496	6.18%	€ 486.72	€ 3,600	7.40	3020
Insulation of Roof : U-value of 0.4 *	45	540	1.34%	€ 105.30	€ 4,050	38.46	653

Ceiling Fans for Office Spaces *	212	2544	6.30%	€ 496.08	€ 3,200	6.45	3078
Occupancy sensors in all offices**	90	1080	2.67%	€ 210.60	€ 1,500	7.12	1307
Variable frequency drives for the air handling unit*	155	1860	4.60%	€ 362.70	€ 1,000	2.76	2251
New laptops**	440	5280	13.07%	€ 1,029.60	€ 26,000	25.25	6389
10kW PV system install at the rooftop**	1250	15000	37.13%	€ 2,925.00	€ 14,000	4.79	18150
Insulation of External Walls : U-value of 0.4*	200	2400	5.94%	€ 468.00	€ 6,200	13.25	2904
Low-E Coated Glass : U-value of 1.8 W/m ² .K and SHGC of 0.3*	326	3912	9.68%	€ 762.84	€ 13,500	17.70	4734
Variable Refrigerant Flow (VRF) Cooling System - COP of 4.4*	331	3972	9.83%	€ 774.54	€ 31,500	40.67	4806
Total	3532.9	42394.24	104.94%	€ 8,266.88	€ 105,660	12.78	51297

Temperature Setting of VRF at 26C° during summer **	50	600	1.49%	€ 117.00	€ 0	0.00	726
Temperature Setting of VRF at 22C° during winter**	50	600	1.49%	€ 117.00	€ 0	0.00	726
Set Desktops to turn off after 15 minutes of idle time**	100	1200	2.97%	€ 234.00	€ 0	0.00	1452
Total of the soft measures	200	2400	5.94%	€ 468.00	€ 0	0	2904

* Energy Savings as per edgebuildings software

** Energy Savings per excel Energy Balance assumptions

Total of the soft measures and high capital expenditure measures	3732.9	44794.24	110.88%	€ 8,734.88	€ 105,660	12.10	54201
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As mentioned above the following measures are included in the high capital expenditure scenario:

Total external walls to insulate more with rock wool insulation to have a u value of 0,4. The total area of external walls is estimated at 124m² at 50 euros per m² thus coming at total cost 6 200 Euros and a payback period of 13,25 years as energy saving is around 6%.

Next, is to install thermal break windows of low-E Coated Glass and a U-value of 1.8 W/m²K and SHGC of 0.3. The total cost is assumed at 250 Euros/m² of a total area of 54 m². Thus investment cost is at 13 500 Euros and an estimated energy saving of 9,68%. The payback period is at 17,7 years.

Third measure is the change of the VRV system. The new Daikin VRV system IV has a COP around 4.4 from 3.6. The total cost of installation is around 31500 Euros and a payback period of 40 years. The energy saving is around 9,83% and CO₂ eq avoidance at 4806 kg.

The soft measures and specifically the setting temperatures were also adjusted due to the change of the VRV and the better efficiency of the system it is expected that the savings will be less.

Another important issue on this scenario is that it seems that energy savings overall is 110.88 %. This means that we have **excess of produced energy of 10,88% than the one we consume** due to the excess capacity of PV installed. Thus, we will proceed and reduce the investment on PV in order to cover only for the remaining energy consumed and not to overproduce. The final results are presented at the table below which is adjusted for the production of the PV.

Energy Efficiency Measures	Energy Savings kWh per month	Energy Savings kWh per year	Energy Savings as % of Total consumption per year	Energy Savings in Euro per year @0,195Euro/kWh	Capital Expenditure	Payback period in years	Environmental Evaluation Avoidance in CO ₂ kg
Occupancy sensors in bathrooms, conference rooms*	155.85	1870.2	4.63%	€ 364.69	€ 500	1.37	2263
Occupancy Sensors in Open Offices *	45.67	548.04	1.36%	€ 106.87	€ 200	1.87	663
Recessed spot leds from 12 W change leds to 6W at 82 units	74	892	2.21%	€ 173.94	€ 410	2.36	1079
External Shading Devices - Annual Average Shading Factor (AASF) of 0.5*	208	2496	6.18%	€ 486.72	€ 3,600	7.40	3020
Insulation of Roof : U-value of 0.4*	45	540	1.34%	€ 105.30	€ 4,050	38.46	653
Ceiling Fans for Office Spaces *	212	2544	6.30%	€ 496.08	€ 3,200	6.45	3078
Occupancy sensors in all offices**	90	1080	2.67%	€ 210.60	€ 1,500	7.12	1307
Variable frequency drives for the air handling unit*	155	1860	4.60%	€ 362.70	€ 1,000	2.76	2251
New laptops**	440	5280	13.07%	€ 1,029.60	€ 26,000	25.25	6389
7kW PV system install at the rooftop**	880	10560	26.14%	€ 2,059.20	€ 9,800	4.76	12778
Insulation of External Walls : U-value of 0.4*	200	2400	5.94%	€ 468.00	€ 6,200	13.25	2904
Low-E Coated Glass : U-value of 1.8 W/m ² .K and SHGC of 0.3*	326	3912	9.68%	€ 762.84	€ 13,500	17.70	4734
Variable Refrigerant Flow (VRF) Cooling System - COP of 4.4*	331	3972	9.83%	€ 774.54	€ 31,500	40.67	4806
Total	3162.9	37954.24	93.95%	€ 7,401.08	€ 101,460	13.71	45925

Temperature Setting of VRF at 26C° during summer **	50	600	1.49%	€ 117.00	€ 0	0.00	726
Temperature Setting of VRF at 22C° during winter**	50	600	1.49%	€ 117.00	€ 0	0.00	726
Set Desktops to turn off after 15 minutes of idle time**	100	1200	2.97%	€ 234.00	€ 0	0.00	1452
Total of the soft measures	200	2400	5.94%	€ 468.00	€ 0	0	2904

* Energy Savings as per edgebuildings software

** Energy Savings per excel Energy Balance assumptions

Total of the soft measures and high capital expenditure measures	3362.9	40354.24	99.89%	€ 7,869.08	€ 101,460	12.89	48829
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The PV's are now reduced at 7kW producing around 10500kWh per year with a capital investment at 9800 Euros.

Overall, the nearly zero energy scenario it's a high capital expenditure scenario were the Law office must spend around 101 460 Euros with a simple payback period of 12,89 years (adding also the soft measures). The energy savings as it's a nearly zero energy scenario is at 99,89% and thus having 7869 Euros in monetary value per year savings. The total CO₂ equivalent avoidance due to energy savings is at 48 829 kg.

Chapter 5-Conclusion

Based on the analysis above and the construction of the three scenarios of low, moderate and high capital expenditure, the law firm will choose to proceed with the low capital expenditure scenario. Due to the difficult times of Covid-19 crisis the management will try to minimize capital expenditure and have maximum benefit. Furthermore, management hesitates to proceed with extreme energy saving measures until results can be tangible. The low capital expenditure scenario of 11 960 Euros and a payback period of 4.12 years offers exactly that. Furthermore, the energy saving is at 36,86% which is a very good percentage for the company. The overall environmental benefit is at CO₂ eq 18 tons.

The other two scenarios, because their interventions are more to the building envelope which will surely disrupt the work of the employees during construction, it's something the management does not want to proceed to that during the next few years. Also, in the near future, the U values in the legislation of the building envelope are expected to change and become even more stricter. So the business is willing to wait until the investment in such hardcore measures will bring bigger savings and reduce the payback period. The only thing that management can examine from the two scenarios of moderate and high capital expenditure is the investment in 10kW PV system at an early stage.

Annex 1-Air Conditioning Equipment Specification

Outdoor unit				RXYQ	8T9	10T	12T	14T	16T	18T	20T	
Capacity range				HP	8	10	12	14	16	18	20	
Cooling capacity	Nom.			KW	22.4 (1) / 22.4 (2)	28.0 (1) / 28.0 (4)	33.5 (1) / 33.5 (4)	40.0 (1) / 40.0 (4)	45.0 (1) / 45.0 (4)	50.4 (1)	56.0 (1)	
Heating capacity	Nom.			KW	22.4 (3) / 22.40 (4)	28.0 (3) / 28.00	33.5 (3) / 33.50	40.0 (3) / 40.0	45.0 (3) / 45.0	50.4 (3)	56.0 (3)	
	Max.			KW	25.0 (3)	31.5 (3)	37.5 (3)	45.0 (3)	50.0 (3)	56.5 (3)	63.0 (3)	
Power input - 50Hz	Cooling	Nom.		KW	5.21 (1) / 4.47 (2)	7.29 (1) / 6.32 (4)	8.98 (1) / 8.09 (4)	11.0 (1) / 9.88 (4)	13.0 (1) / 12.10 (4)	15.0 (1)	18.5 (1)	
		Heating	Nom.	KW	4.75 (3) / 4.47 (4)	6.29 (3) / 5.47	7.77 (3) / 6.59	9.52 (3) / 9.30	11.1 (3) / 9.8	12.6 (3)	14.5 (3)	
		Max.		KW	5.51 (3)	7.38 (3)	9.10 (3)	11.2 (3)	12.8 (3)	14.6 (3)	17.0 (3)	
EER					4.30 (1) / 5.01 (2)	3.84 (1) / 4.43 (4)	3.73 (1) / 4.14 (4)	3.64 (1) / 4.05 (4)	3.46 (1) / 3.73 (4)	3.36 (1)	3.03 (1)	
ESEER - Automatic					7.53	7.20	6.96	6.83	6.50	6.38	5.67	
ESEER - Standard					6.37	5.67	5.50	5.31	5.05	4.97	4.42	
COP - Max.					4.54 (3)	4.27 (3)	4.12 (3)	4.02 (3)	3.91 (3)	3.87	3.71	
COP - Nom.					4.72 (3) / 5.01 (4)	4.45 (3) / 5.12	4.31 (3) / 5.08	4.20 (3) / 4.30	4.05 (3) / 4.59	4.00	3.86	
Maximum number of connectable indoor units					64 (5)							
Indoor index connection				Min./Nom./Max.	100/200/260	125/250/325	150/300/390	175/350/455	200/400/520	225/450/585	250/500/650	
Dimensions				Unit	1,685x930x765							
HeightxWidthxDepth				mm								
Weight				Unit	187	194		305		314		
Fan				Air flow rate	Cooling	Nom.	m ³ /min	162	175	185	223	260
Sound power level				Cooling	Nom.	dBA	78	79		81	86	251
Sound pressure level				Cooling	Nom.	dBA				61	64	65
Operation range				Cooling	Min.-Max.	°CDB				-5-43		
				Heating	Min.-Max.	°CWB				-20-15.5		
Refrigerant				Type/GWP	R-410A/2,0875							
Charge				kg/ TCO ₂ eq	5.9/ 12.3	6/ 12.5	6.3/ 13.2	10.3/ 21.5	10.4/ 21.7	11.7/ 24.4	11.8/ 24.6	
Piping connections				Liquid	OD	mm	9.52		12.7			15.9
				Gas	OD	mm	19.1	22.2		28.6		
Total piping length				System	Actual	m			1,000			
Power supply				Phase/Frequency/Voltage	3N~/50/380-415							
Current - 50Hz				Maximum fuse amps (MFA)	A	20	25	32		40		50

Outdoor unit				RXYQ	22T	24T9	26T	28T	30T	32T	34T	36T
System		Outdoor unit module 1		RXYQ10T	RXYQ8T9		RXYQ12T				RXYQ16T	
		Outdoor unit module 2		RXYQ12T	RXYQ16T	RXYQ14T	RXYQ18T	RXYQ16T	RXYQ18T	RXYQ16T	RXYQ18T	RXYQ20T
Capacity range				HP	22	24	26	28	30	32	34	36
Cooling capacity	Nom.			KW	61.5	67.4	73.5	78.5	83.9	90.0	95.4	101.0
Heating capacity	Nom.			KW	61.5	67.4	73.5	78.5	83.9	90.0	95.4	101.0
	Max.			KW	69.0	75.0	82.5	87.5	94.0	100.0	106.5	113.0
Power input - 50Hz	Cooling	Nom.		KW	16.27	18.2	20.0	22.0	24.0	26.0	28.0	31.5
		Heating	Nom.	KW	14.06	15.85	17.29	18.87	20.4	22.2	23.7	25.6
		Max.		KW	16.48	18.31	20.30	21.90	23.7	25.6	27.4	29.8
EER					3.77	3.70	3.68	3.57	3.5	3.46	3.4	3.21
ESEER - Automatic					7.07	6.81	6.89	6.69	6.60	6.50	6.44	6.02
ESEER - Standard					5.58	5.42	5.39	5.23	5.17	5.05	5.01	4.68
COP - Max.					4.19	4.10	4.06	4.00	4.1	3.91	3.9	3.79
COP - Nom.					4.37		4.25	4.16	4.1	4.05	4.0	3.95
Maximum number of connectable indoor units					64							
Indoor index connection				Min./Nom./Max.	275/550/715	300/600/780	325/650/845	350/700/910	375/750/975	400/800/1,040	425/850/1,105	450/900/1,170
Piping connections				Liquid	OD	mm	15.9			19.1		
				Gas	OD	mm	28.6		34.9		41.3	
Total piping length				System	Actual	m			1,000			
Current - 50Hz				Maximum fuse amps (MFA)	A		63			80		

Outdoor unit				RXYQ	38T9	40T	42T	44T	46T	48T	50T	52T	54T
System		Outdoor unit module 1		RXYQ8T9		RYMQ10T		RYMQ12T	RYMQ14T		RYMQ16T		RYMQ18T
		Outdoor unit module 2		RXYQ10T	RYMQ12T			RYMQ16T					RYMQ18T
		Outdoor unit module 3		RXYQ20T	RYMQ18T			RYMQ16T					RYMQ18T
Capacity range				HP	38	40	42	44	46	48	50	52	54
Cooling capacity	Nom.			KW	106.3	111.9	118.0	123.5	130.0	135.0	140.0	145.8	151.2
Heating capacity	Nom.			KW	106.3	111.9	118.0	123.5	130.0	135.0	140.0	145.8	151.2
	Max.			KW	119.0	125.5	131.5	137.5	145.0	150.0	156.0	163.0	169.5
Power input - 50Hz	Cooling	Nom.		KW	29.2	31.3	33.3	35.0	37.0	39.0	40.7	43.0	45.0
		Heating	Nom.	KW	25.1	26.7	28.49	29.97	31.72	33.3	34.6	36.3	37.8
		Max.		KW	29.2	31.1	32.98	34.70	36.8	38.4	40.0	42.0	43.8
EER					3.6		3.54		3.51	3.46	3.44	3.4	3.40
ESEER - Automatic					6.36	6.74	6.65	6.62	6.60	6.50	6.46	6.42	6.38
ESEER - Standard					5.03	5.29	5.19	5.17	5.13	5.05	5.02	4.99	4.97
COP - Max.					4.1	4.0	3.99	3.96	3.94	3.91		3.90	
COP - Nom.						4.2	4.14	4.12	4.10	4.05		4.0	
Maximum number of connectable indoor units					64								
Indoor index connection				Min./Nom./Max.	475/950/1,235	500/1,000/1,300	525/1,050/1,365	550/1,100/1,430	575/1,150/1,495	600/1,200/1,560	625/1,250/1,625	650/1,300/1,690	675/1,350/1,755
Piping connections				Liquid	OD	mm			19.1				
				Gas	OD	mm			41.3				
Total piping length				System	Actual	m			1,000			125	
Current - 50Hz				Maximum fuse amps (MFA)	A		100						

(1) Nominal cooling capacities are based on: indoor temperature: 27°CDB, 19°CWB, outdoor temperature: 35°CDB, equivalent refrigerant piping: 5m, level difference: 0m. Data for standard efficiency series (2) Nominal cooling capacities are based on: indoor temperature: 20°CDB, outdoor temperature: 7°CDB, 6°CWB, equivalent refrigerant piping: 5m, level difference: 0m. Data for high efficiency series (3) Nominal heating capacities are based on: indoor temperature: 20°CDB, outdoor temperature: 7°CDB, 6°CWB, equivalent refrigerant piping: 5m, level difference: 0m. Data for high efficiency series (4) Nominal heating capacities are based on: indoor temperature: 20°CDB, outdoor temperature: 7°CDB, 6°CWB, equivalent refrigerant piping: 5m, level difference: 0m. Data for high efficiency series (5) Actual number of connectable indoor units depends on the indoor unit type (VRV indoor, Hydrobox, RA indoor, etc.) and the connection ratio restriction for the system (50% <= CR <= 130%) | Contains fluorinated gasses

Daikin Europe N.V. Naamloze Vennootschap · Zandvoordestraat 300 · 8400 Oostende · Belgium · www.daikin.eu · BE 0412 120 336 · RPR Oostende (Responsible Editor)



ECPEN15-232 03/15



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Annex 2 Report of the edgebuilding software

Project Details

Project Name	Address Line1
Stelios Americanos LLC	Dimostheni Severi 12
Number of Distinct Buildings	Address Line2
1	6th floor
Number of EDGE Subproject(s) associated	City
1	Nicosia
Total Project Floor Area (m ²)	State/ Province
405	
Project Owner Name	Postal Code
George Louca	
Project Owner Email	Country
george_louca@hotmail.com	Cyprus
Project Owner Phone	Project Number
Mobile 0035 - 799222461	1000621513
Share with Investor(s) or Bank(s)?	
No	

Associated Subproject(s)
Stelios Americanos LLC

Subproject Details

Subproject Name	Address Line1
Stelios Americanos LLC	Demostheni Severi Avenue 12
Office Name	Address Line2
601	6th Floor
Subproject Multiplier for the Project	City
1	Nicosia
Certification Stage	State/ Province
Post-Construction	
Status	Postal Code
Self-Review	
Auditor	Country
	Cyprus
Certifier	Subproject Type
	Existing Building 2007

Building Utility Data

Annual Measured Electricity Consumption (kWh/Year)
40400

Existing Building Energy Performance Index (kWh/m²/Year)
99.75

Annual Measured Water Consumption (m³/Year)

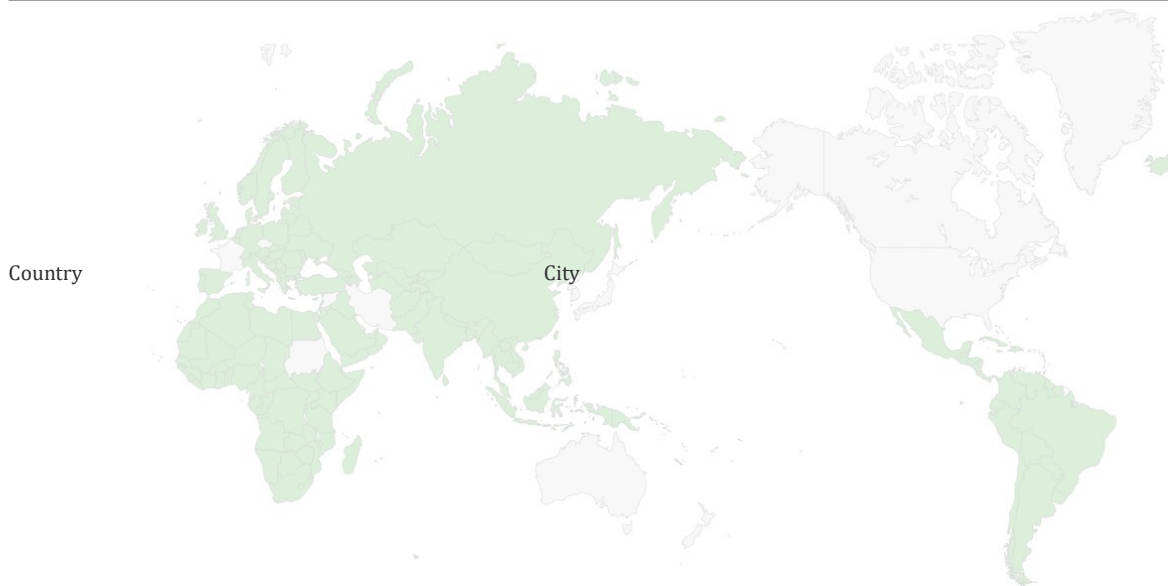
Existing Building Water Usage Index (Lts/Person/Day)
0.00

Annual Measured Natural Gas Consumption (m³/Year)

Annual Measured Diesel Consumption (kL/Year) Annual

Measured LPG Consumption (Kg/Year)

Location Data



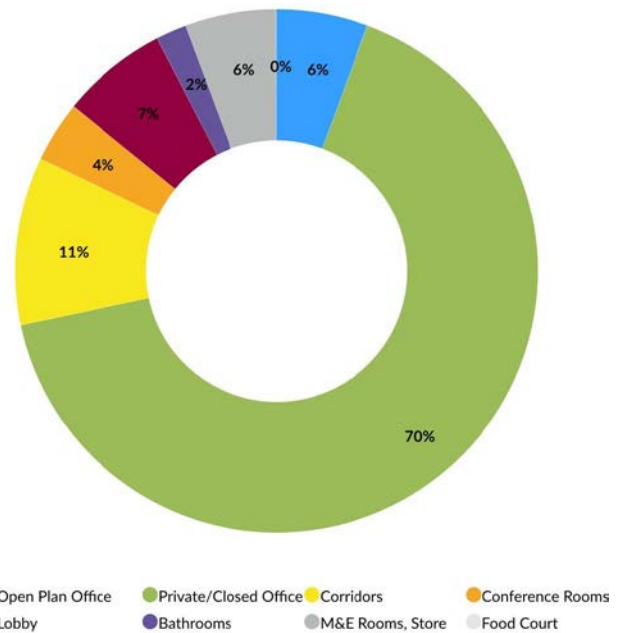
Building Data

	Default	User Entry
Gross Internal Area Excluding Car Parking (m ²)	Occupancy Density (m ² /Person)	
405	12	15
Floors Above Grade (no.)	Operational Hours (Hours/Day)	
1	10	10
Floors Below Grade (no.)	Working Days (Days/Week)	
3	5	
Floor-to-Floor Height (m)	Holidays (Days/Year)	
3.5	12	12
Food Court		
Cellular Office		

Default	User Entry
Open Plan Office (m ²)	26
Private/Closed Office (m ²)	283
Corridors (m ²)	45
Conference Rooms (m ²)	16
Lobby (m ²)	27
Bathrooms (m ²)	8
M&E Rooms, Store ** (m ²)	0

Gross Internal Area (m²)
405

**The M&E Rooms, Store field is equal to the remaining space required to total the gross internal area excluding car parking.



Building Orientation

	<i>Building Lengths</i>	
	<i>Default</i>	<i>User Entry</i>
Floor Plan Depth*** (m)	North (m)	
25.6	0.0	25.6
Main Orientation***	South (m)	
Northeast	0.0	25.6
	East (m)	
	0.0	24.9
*** These parameters will be used to estimate building dimensions. If the exact details of the dimensions and orientation are available, then complete the User Entry fields in the Building Lengths section. The orientation of the building will have a direct effect on energy consumption.	West (m)	
	0.0	24.9
	Northeast (m)	
	25.6	
	Northwest (m)	
	4.0	
	Southeast (m)	
	4.0	
	Southwest (m)	
	25.6	

Building Systems

Does the building design include an AC system?

Yes

Does the building design include a space heating system?

Yes

Key Assumptions for the Base Case

<i>Default</i>	<i>User Entry</i>	<i>Default</i>	<i>User Entry</i>
Fuel Used for Electric Generator			
Diesel	Diesel		
Fuel Used for Cooking			
Electricity	Electricity	Jan	
Fuel Used for Space Heating		11.5	
Electricity	Electricity	Feb	
% of Electricity Generation Using Diesel (% Ave. Yrly)		11.8	
5%		Mar	
Cost of Electricity (\$/kWh)		14.4	
0.12	0.195	Apr	
Cost of Diesel Fuel (\$/L)		17.8	
0.826		May	
Cost of LPG/Natural Gas (\$/L)		22.2	
0.000		Jun	
Cost of Water (\$/kL)		26.2	
1.250		Jul	
CO ₂ Emissions from Electricity Generation (g/kWh)		28.6	
441.00		Aug	
Window to Wall Ratio (%)		28.5	
40%		Sep	
Solar Reflectivity for Paint - Wall (%)		25.7	
30%		Oct	
Solar Reflectivity for Paint - Roof (%)		22.3	
30%		Nov	
Roof U-value (W/m ² .K)		17.3	
0.40		Dec	
Wall U-value (W/m ² .K)		13.2	
0.40		Latitude (Deg)	
Glass U-value (W/m ² .K)		35.10	
2.90		Annual Average Rainfall (mm)	
Glass SHGC (Factor)		352.00	
0.63			
Cooling System			
ASHRAE 90.1.2007	ASHRAE 90.1.2007		
AC System Efficiency (COP)			
2.66			
Heating System			
ASHRAE 90.1.2007	ASHRAE 90.1.2007		
Heating System Efficiency (COP)			
4.00			

Results

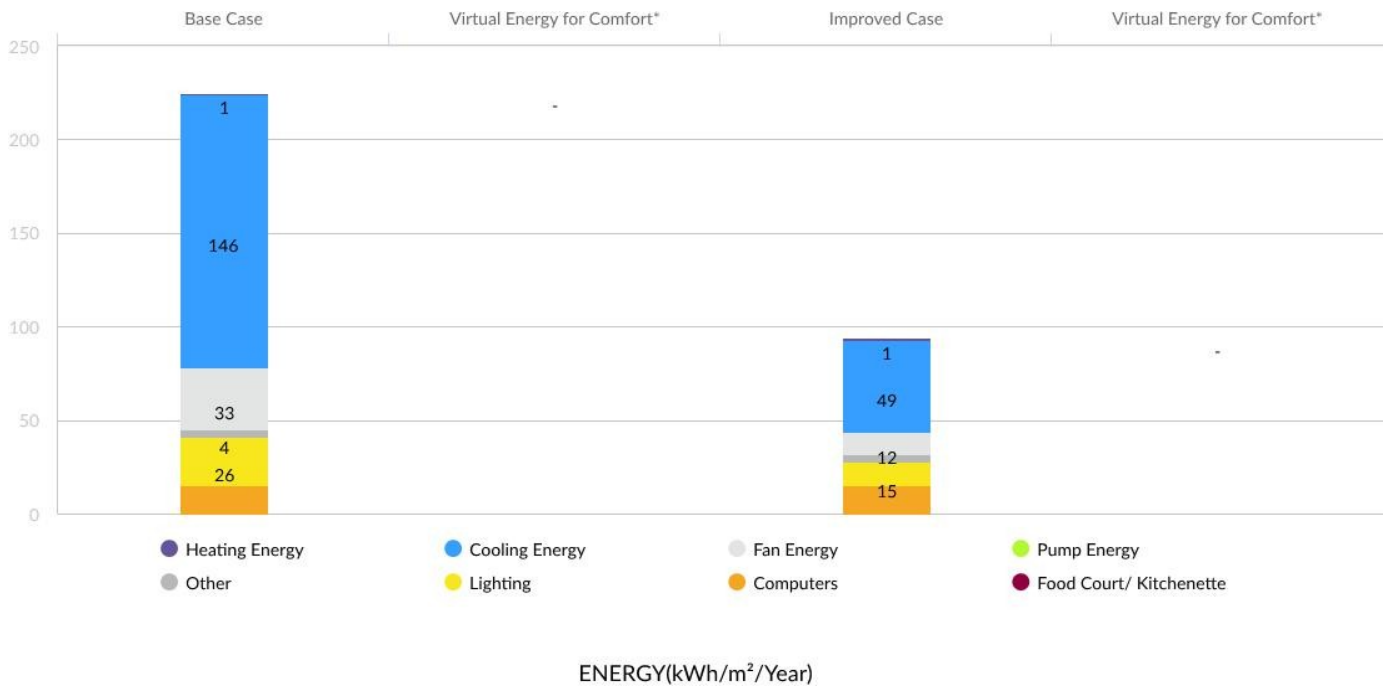
Final Energy Use (kWh/Month)	3,371.11	Operational CO ₂ Savings (tCO ₂ /Year)	23.99
Final Water Use (m ³ /Month)	50.52	Embodied Energy Savings (MJ/m ²)	1,389.07
Base Case Utility Cost (\$/Month)	1,634.15	Incremental Cost (\$)	78,290.96
Utility Cost Reduction (\$/Month)	913.00	Payback in Years (Yrs.)	7.15
Energy Savings (MWh/Year)	56.16	Water Savings (m ³ /Year)	0.00
Embodied Energy in Materials Savings (GJ)	562.57	Total Subproject Floor Area (m ²)	405
Carbon Emissions (tCO ₂ /Year)	17.30		

ENERGY SAVINGS

EDGE ADVANCED

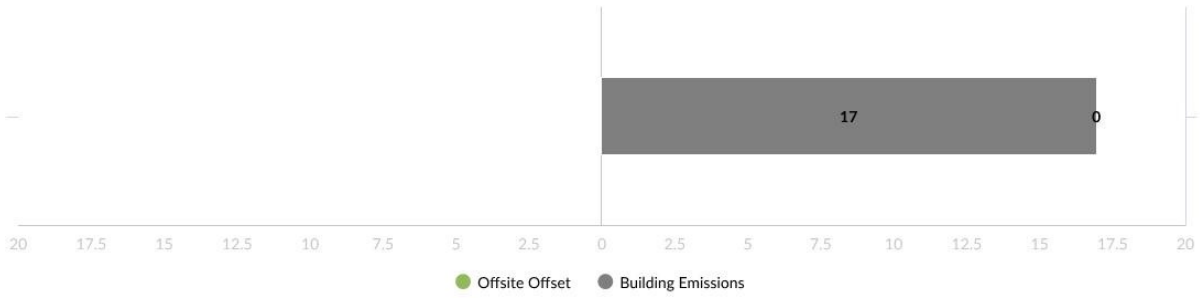
Energy Efficiency Measures 58.13%

Meets EDGE Energy Standard



*Virtual energy is the amount of energy that will be required based on the assumption that the office will eventually install air conditioning or heating.

Carbon Emissions: 17.30 tCO₂/Year

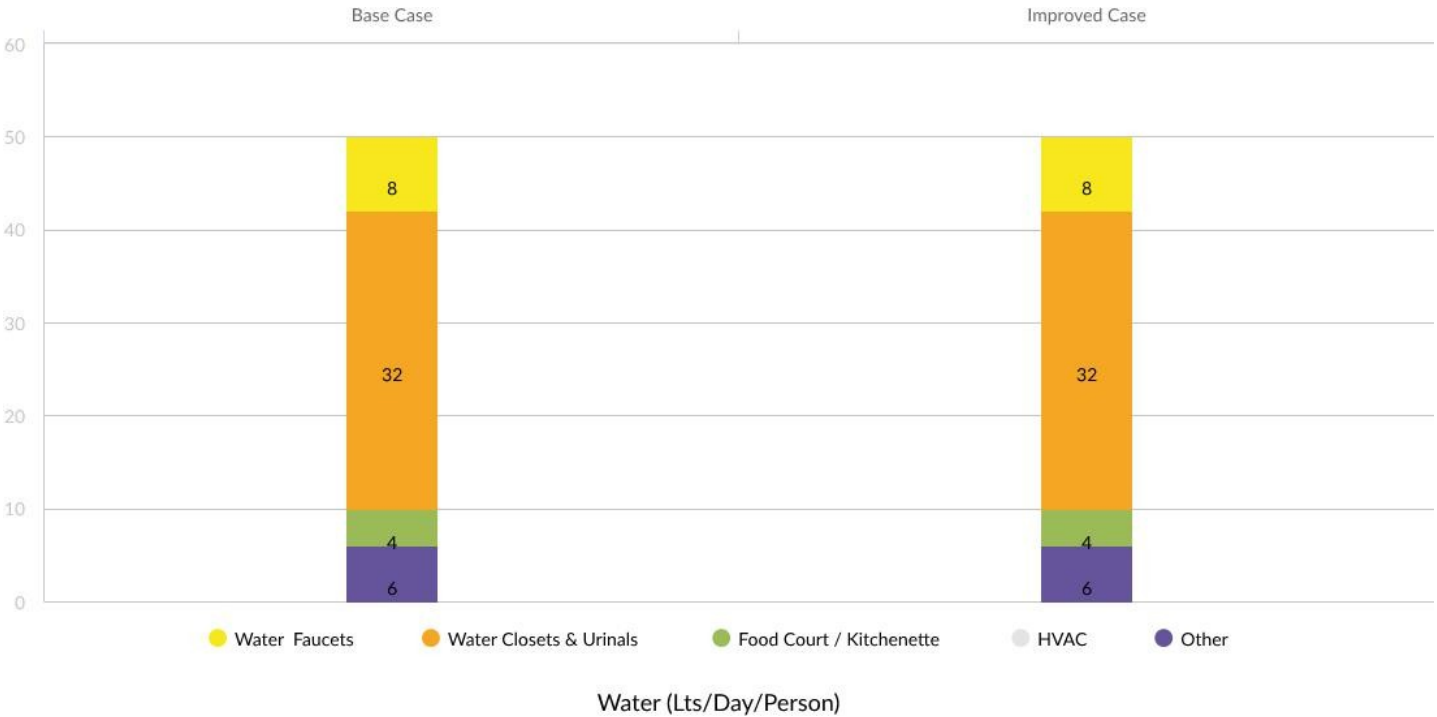


Energy Efficiency Measures 58.13%

<ul style="list-style-type: none"> ✓ OFE01 Reduced Window to Wall Ratio - WWR of 30% <ul style="list-style-type: none"> North 30 South 30 East 30 West 30 	<ul style="list-style-type: none"> Northeast 30 Northwest 30 Southeast 30 Southwest 30 	<ul style="list-style-type: none"> OFE17 Recovery of Waste Heat from the Generator for Space Heating
<ul style="list-style-type: none"> Of ✓ OFE02 Reflective Paint/Tiles for Roof - Solar Reflectivity (albedo) of 0.5 SR 0.5 ✓ OFE03 Reflective Paint for External Walls - Solar Reflectivity (albedo) of 0.16 SR 0.16 ✓ OFE04 External Shading Devices - Annual Average Shading Factor (AASF) of 0.28 AASF 0.28 		<ul style="list-style-type: none"> OFE18 Variable Speed Drives on the Fans of Cooling Towers OFE19 Variable Frequency Drives in AHUs
<ul style="list-style-type: none"> ✓ OFE05 Insulation of Roof : U-value of 0.75 W/m².K 0.75 ✓ OFE06 Insulation of External Walls : U-value of 0.85 W/m².K 0.85 ✓ OFE07 Low-E Coated Glass : U-value of 3.8 W/m².K and SHGC of 0.4 W/m².K 3.8 SHGC 0.4 		<ul style="list-style-type: none"> OFE20 Variable Speed Drives Pumps ✓ OFE21 Sensible Heat Recovery from Exhaust Air - Efficiency of 60% % Eff. 60 OFE22 High-Efficiency Boiler for Space Heating - Efficiency of 90%
<ul style="list-style-type: none"> OFE08 Higher Thermal Performance Glass : U- value of 1.95 W/m².K and SHGC of 0.28 		<ul style="list-style-type: none"> OFE23 Air Economizers During Favorable Outdoor Conditions OFE24 ✓ Energy-Saving Light Bulbs - Internal Spaces
<ul style="list-style-type: none"> OFE09 Natural Ventilation with Operable Windows and No A/C OFE10 		<ul style="list-style-type: none"> OFE25 Energy-Saving Light Bulbs - External Spaces OFE26 Lighting Controls for Corridors and Staircases
<ul style="list-style-type: none"> Ceiling Fans for Office Spaces 		<ul style="list-style-type: none"> OFE27 Occupancy Sensors in Bathrooms, Conference Rooms, and Closed Cabins
<ul style="list-style-type: none"> ✓ OFE11 Variable Refrigerant Flow (VRF) Cooling System - COP of 3.6 COP 3.6 		<ul style="list-style-type: none"> OFE28 Occupancy Sensors in Open Offices
<ul style="list-style-type: none"> OFE12 Air Conditioning with Air Cooled Screw Chiller - COP of 3.3 OFE13 		<ul style="list-style-type: none"> OFE29 Daylight Photoelectric Sensors for Internal Spaces
<ul style="list-style-type: none"> Air Conditioning with Water Cooled Chiller - COP of 6.1 		<ul style="list-style-type: none"> OFE30 Solar Photovoltaics - 25% of Total Energy Use OFE31
<ul style="list-style-type: none"> OFE14 Ground Source Heat Pump - COP of 5.2 		<ul style="list-style-type: none"> Other Renewable Energy for Electricity Generation
<ul style="list-style-type: none"> OFE15 Absorption Chiller Powered by Waste Heat - COP of 0.7 OFE16 		<ul style="list-style-type: none"> OFE32 Offsite Renewable Energy Procurement - Equal to 100% of total Operational CO₂
<ul style="list-style-type: none"> Radiant Cooling and Heating System - COP of RC 3.6 		<ul style="list-style-type: none"> OFE33 Carbon Offset - 100% of Total CO₂

WATER SAVINGS

Water Efficiency Measures 0.00%



OFW01 Low-Flow Faucets in All Bathrooms - 2 L/min

OFW02 Dual Flush for Water Closets in All Bathrooms - 6 L/first flush and 3 L/second flush

OFW03 Water-Efficient Urinals in All Other Bathrooms - 2 L/flush

OFW04 Water-Efficient Faucets for Kitchen Sinks - 4 L/min

OFW05 Condensate Water Recovery

OFW06 Rainwater Harvesting System - 50% of Roof Area Used for Rainwater Collection

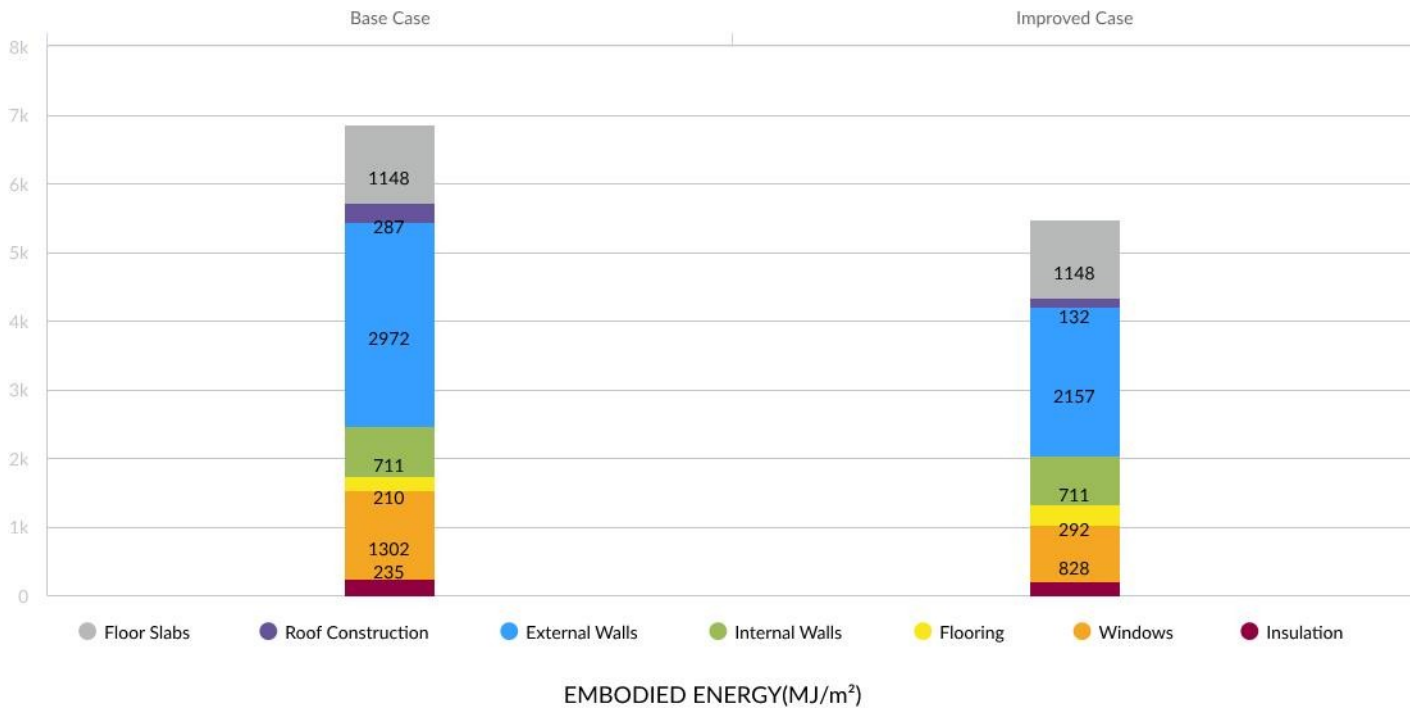
OFW07 Grey Water Treatment and Recycling System

OFW08 Black Water Treatment and Recycling System

EMBODIED ENERGY SAVINGS

Materials Efficiency Measures 20.24%
Material Standard

Meets EDGE



			Proportion %	Thickness (mm)	Steel Rebar (kg/m ²)
OFM01	Floor Slabs In-Situ Reinforced Concrete Slab 350 mm Steel : 35 kg/m ²	In-Situ Reinforced Concrete Slab			
OFM02	Roof Construction In-Situ Reinforced Concrete Slab 350 mm Steel : 35 kg/m ²	Type 1 Concrete Filler Slab with Polystyrene Blocks	100 %		
OFM03	External Walls Common Brick Wall with Internal & External Plaster 200 mm	Type 1 Aluminium Profile Cladding	100 %		
OFM04	Internal Walls Common Brick Wall with Plaster on Both Sides 100 mm	Type 1 Common Brick Wall with Plaster on Both Sides	100 %		
OFM05	Flooring Ceramic Tile	Type 1 Laminated Wooden Flooring	100 %		
OFM06	Window Frames Aluminium Double Glazing	Type 1 Aluminium	100 %		Single Glazing
OFM07	Wall Insulation Polystyrene U : ~ 68 W/m ² k	Polystyrene			
OFM08	Roof Insulation Polystyrene U : ~ 69 W/m ² k	Polystyrene		5	

EDGE Certification Checklist

Building Type	Certification Stage	Subproject Name
Offices	Post-Construction	Stelios Americanos LLC
Energy Measures		Construction Audit Requirements
OFE01	Reduced Window to Wall Ratio	<p>As-built façade drawings. External and internal photographs of the building showing all the elevations.</p> <p>Updated WWR calculations if required, or confirmation that the design WWR is still valid.</p>
OFE02	Reflective Paint/Tiles for Roof	<p>Product data sheet for the materials and finish (including the solar reflectivity value).</p> <p>Photographs of the roof materials and finish (where the finish is white this can be awarded without further evidence).</p> <p>Delivery note and purchase documents indicating that the specified roof finish has been delivered to the construction site.</p>
OFE03	Reflective Paint for External Walls	<p>Product data sheet for the wall finish (including the solar reflectivity value).</p> <p>Photographs of the wall materials and finish (where the finish is white, this can be awarded without further evidence).</p> <p>Delivery note and purchase documents indicating that the specified wall finish has been delivered to the construction site.</p>
OFE04	External Shading Devices	<p>Photographs of the shading devices on all façades.</p> <p>As-built façade drawings showing the shading devices that have been installed.</p> <p>Update of shading factor calculations in case of changes from the design stage.</p>
OFE05	Insulation of Roof	<p>Delivery note confirming that the insulation material was delivered to the site.</p> <p>Photographs of the roof construction at a point when the insulation material was visible.</p> <p>Updated calculations for the U value if the thickness and type of insulation changed from the original design.</p>
OFE06	Insulation of External Walls	<p>Delivery note confirming that the insulation material was delivered to the site.</p> <p>Photographs of the external walls construction at a point when the insulation material was visible.</p> <p>Updated calculations for U value if the thickness and type of insulations changed from the original design.</p>
OFE07	Low-E Coated Glass	<p>Photographs of the glazing units installed.</p> <p>Purchase receipts and delivery notes for the glazing.</p> <p>Manufacturer's data sheets showing the seasonal average U Value for the glazing (including losses through the glass and frame) and the solar heat gain coefficient (SHGC) of the glass.</p>

OFE11	Variable Refrigerant Volume (VRV) Cooling System	<p>A As-built mechanical drawings with air conditioning schematics.</p> <hr/> <p>D Delivery notes showing that specified chillers have been delivered to the site.</p> <hr/> <p>M Manufacturer's data sheets for the VRV cooling system specifying COP information.</p> <hr/> <p>P Photographs of installed external and internal air conditioning units.</p>
OFE21	Sensible Heat Recovery from Exhaust Air	<p>A As-built mechanical and electrical drawings with the location of recovery technology, if changed from design.</p> <hr/> <p>D Delivery notes showing that specified recovery technology have been delivered to the site.</p> <hr/> <p>M Manufacturer's data sheets for the Sensible Heat recovery technology used specifying efficiency (TTE) if changed from design.</p> <hr/> <p>P Photographs of installed heat recovery system.</p>
OFE24	Energy-Saving Light Bulbs - Internal Spaces	<p>P Photographs of the lighting installation. It is not necessary to take photos of every single installed lamp, but the auditor must be convinced that a reasonable proportion has been checked and verified.</p> <hr/> <p>A As-built electrical drawings with the lighting layout if changed from design.</p> <hr/> <p>P Purchase receipts and delivery notes for lamps</p>
Material Measures		Construction Audit Requirements
OFM01	Floor Slabs	<p>D Date stamped photographs of floor slabs taken during or after construction; and</p> <hr/> <p>P Purchase receipt for the specified floor slab material; or</p> <hr/> <p>D Delivery notes.</p>
OFM02	Roof Construction	<p>D Date stamped photograph of the roof taken during or after construction; and</p> <hr/> <p>P Purchase receipt for the building materials used for roof construction; or</p> <hr/> <p>D Delivery note for materials used for roof construction.</p>
OFM03	External Walls	<p>D Date stamped photograph of the wall taken during or after construction; and</p> <hr/> <p>P Purchase receipt for the building materials used for wall construction; or</p> <hr/> <p>D Delivery note for materials used for wall construction.</p>
OFM04	Internal Walls	<p>D Date stamped photograph of the wall taken during or after construction; and</p> <hr/> <p>P Purchase receipt for the building materials used for wall construction; or</p> <hr/> <p>D Delivery note for materials used for wall construction.</p>
OFM05	Flooring	<p>D Date stamped photograph of the flooring once fitted; and</p> <hr/> <p>P Purchase receipt for the specified building materials used as a floor finish; or</p>

OFM05	Flooring		Delivery note for materials used for flooring.
OFM06	Window Frames	✓	Date stamped photograph of the installed windows; and
		✓	Purchase receipt for the specified window; or
		✓	Delivery note for windows.
OFM07	Wall Insulation	✓	Date stamped photograph of the insulation installed during construction; and
		✓	An invoice for the specified insulation; or
		✓	Delivery note for materials used for insulation.
OFM08	Roof Insulation	✓	Date stamped photograph of the insulation installed during construction; and
		✓	An invoice for the specified insulation; or
		✓	Delivery note for materials used for insulation.
		✓	

Appendix E

Baseline Data

	Date	θ_{max} (°C)	θ_{min} (°C)	Woking Days excluding Holidays	θ_b CDD (°C)	θ_b HDD (°C)	Daily Cooling Degree Days	Daily Heating Degree Days	Cooling Degree Days of net working days	Heating Degree days of net working days	Total Cooling Degree Days Bimonthly	Total Heating Degree Days Bimonthly	total kWh
	22/05/2015			1	18	22	0.00	22.00	0.00	22.00			
	23/05/2015			0	18	22	0.00	22.00	0.00	0.00			
	24/05/2015			0	18	22	0.00	22.00	0.00	0.00			
	25/05/2015			1	18	22	0.00	22.00	0.00	22.00			
	26/05/2015			1	18	22	0.00	22.00	0.00	22.00			
	27/05/2015			1	18	22	0.00	22.00	0.00	22.00			
1	28/05/2015	28.3	24.1	1	18	22	8.20	0.00	8.20	0.00			
2	29/05/2015	24.3	22.6	1	18	22	5.45	0.00	5.45	0.00			
3	30/05/2015	22.9	20.7	0	18	22	3.80	0.43	0.00	0.00			
4	31/05/2015	27.1	20.3	0	18	22	5.70	0.43	0.00	0.00			
5	01/06/2015	30.7	22.9	0	18	22	8.80	0.00	0.00	0.00			
6	02/06/2015	33.3	25.7	1	18	22	11.50	0.00	11.50	0.00			
7	03/06/2015	29.6	23.2	1	18	22	8.40	0.00	8.40	0.00			
8	04/06/2015	29	21.4	1	18	22	7.20	0.15	7.20	0.15			
9	05/06/2015	29.3	23.3	1	18	22	8.30	0.00	8.30	0.00			
10	06/06/2015	28.7	22.8	0	18	22	7.75	0.00	0.00	0.00			
11	07/06/2015	29.7	22.8	0	18	22	8.25	0.00	0.00	0.00			
12	08/06/2015	31.7	24.4	1	18	22	10.05	0.00	10.05	0.00			
13	09/06/2015	30.9	26.5	1	18	22	10.70	0.00	10.70	0.00			
14	10/06/2015	28.4	23.4	1	18	22	7.90	0.00	7.90	0.00			
15	11/06/2015	26.4	23.9	1	18	22	7.15	0.00	7.15	0.00			

16	12/06/2015	29.6	23.6	1	18	22	8.60	0.00	8.60	0.00			
17	13/06/2015	31.6	23.5	0	18	22	9.55	0.00	0.00	0.00			
18	14/06/2015	31.9	25.9	0	18	22	10.90	0.00	0.00	0.00			
19	15/06/2015	34.8	28.1	1	18	22	13.45	0.00	13.45	0.00			
20	16/06/2015	35.1	29.9	1	18	22	14.50	0.00	14.50	0.00			
21	17/06/2015	35.3	30.9	1	18	22	15.10	0.00	15.10	0.00			
22	18/06/2015	36.2	28.4	1	18	22	14.30	0.00	14.30	0.00			
23	19/06/2015	30.9	25.3	1	18	22	10.10	0.00	10.10	0.00			
24	20/06/2015	28.6	24.9	0	18	22	8.75	0.00	0.00	0.00			
25	21/06/2015	31.7	25	0	18	22	10.35	0.00	0.00	0.00			
26	22/06/2015	32.1	25.3	1	18	22	10.70	0.00	10.70	0.00			
27	23/06/2015	31	25.1	1	18	22	10.05	0.00	10.05	0.00			
28	24/06/2015	31.5	25	1	18	22	10.25	0.00	10.25	0.00			
29	25/06/2015	34.5	26.6	1	18	22	12.55	0.00	12.55	0.00			
30	26/06/2015	35.4	28.2	1	18	22	13.80	0.00	13.80	0.00			
31	27/06/2015	33.2	26.5	0	18	22	11.85	0.00	0.00	0.00			
32	28/06/2015	29.9	25.9	0	18	22	9.90	0.00	0.00	0.00			
33	29/06/2015	28.2	24.5	1	18	22	8.35	0.00	8.35	0.00			
34	30/06/2015	31.6	24.9	1	18	22	10.25	0.00	10.25	0.00			
35	01/07/2015	34	25.7	1	18	22	11.85	0.00	11.85	0.00			
36	02/07/2015	34	28.7	1	18	22	13.35	0.00	13.35	0.00			
37	03/07/2015	35.2	26.6	1	18	22	12.90	0.00	12.90	0.00			
38	04/07/2015	36.2	28.4	0	18	22	14.30	0.00	0.00	0.00			
39	05/07/2015	35.8	29.9	0	18	22	14.85	0.00	0.00	0.00			
40	06/07/2015	35.2	28.8	1	18	22	14.00	0.00	14.00	0.00			
41	07/07/2015	35.4	26.4	1	18	22	12.90	0.00	12.90	0.00			

42	08/07/2015	36	27.4	1	18	22	13.70	0.00	13.70	0.00			
43	09/07/2015	34.9	27.7	1	18	22	13.30	0.00	13.30	0.00			
44	10/07/2015	34.5	27.1	1	18	22	12.80	0.00	12.80	0.00			
45	11/07/2015	35.1	27.7	0	18	22	13.40	0.00	0.00	0.00			
46	12/07/2015	34.5	26.6	0	18	22	12.55	0.00	0.00	0.00			
47	13/07/2015	35.5	31.5	1	18	22	15.50	0.00	15.50	0.00			
48	14/07/2015	36.2	30.8	1	18	22	15.50	0.00	15.50	0.00			
49	15/07/2015	37.2	30.2	1	18	22	15.70	0.00	15.70	0.00			
50	16/07/2015	38	31.7	1	18	22	16.85	0.00	16.85	0.00			
51	17/07/2015	37.7	33	1	18	22	17.35	0.00	17.35	0.00			
52	18/07/2015	37.8	32.1	0	18	22	16.95	0.00	0.00	0.00			
53	19/07/2015	38.7	32.7	0	18	22	17.70	0.00	0.00	0.00			
54	20/07/2015	39.6	32.3	1	18	22	17.95	0.00	17.95	0.00			
55	21/07/2015	38.5	31.9	1	18	22	17.20	0.00	17.20	0.00			
56	22/07/2015	38.9	30.1	1	18	22	16.50	0.00	16.50	0.00			
57	23/07/2015	38.3	29.7	1	18	22	16.00	0.00	16.00	0.00	490.20	0.15	7621
58	24/07/2015	34.9	25.9	1	18	22	12.40	0.00	12.40	0.00			
59	25/07/2015	34.4	27.4	0	18	22	12.90	0.00	0.00	0.00			
60	26/07/2015	34.9	27.7	0	18	22	13.30	0.00	0.00	0.00			
61	27/07/2015	36.2	27.9	1	18	22	14.05	0.00	14.05	0.00			
62	28/07/2015	37.4	28	1	18	22	14.70	0.00	14.70	0.00			
63	29/07/2015	35.6	29	1	18	22	14.30	0.00	14.30	0.00			
64	30/07/2015	36.1	29.7	1	18	22	14.90	0.00	14.90	0.00			
65	31/07/2015	36.1	28	1	18	22	14.05	0.00	14.05	0.00			
66	01/08/2015	37.8	29.2	0	18	22	15.50	0.00	0.00	0.00			
67	02/08/2015	40.5	32.3	0	18	22	18.40	0.00	0.00	0.00			

68	03/08/2015	42.2	34.9	1	18	22	20.55	0.00	20.55	0.00			
69	04/08/2015	40.9	34.2	1	18	22	19.55	0.00	19.55	0.00			
70	05/08/2015	39.4	30.4	1	18	22	16.90	0.00	16.90	0.00			
71	06/08/2015	36	29.2	1	18	22	14.60	0.00	14.60	0.00			
72	07/08/2015	37.5	28.4	1	18	22	14.95	0.00	14.95	0.00			
73	08/08/2015	37.5	29.7	0	18	22	15.60	0.00	0.00	0.00			
74	09/08/2015	35.1	29.5	0	18	22	14.30	0.00	0.00	0.00			
75	10/08/2015	34.4	28.9	1	18	22	13.65	0.00	13.65	0.00			
76	11/08/2015	34.4	28.7	1	18	22	13.55	0.00	13.55	0.00			
77	12/08/2015	35.5	27.9	1	18	22	13.70	0.00	13.70	0.00			
78	13/08/2015	37.8	28.9	1	18	22	15.35	0.00	15.35	0.00			
79	14/08/2015	37.9	28.4	1	18	22	15.15	0.00	15.15	0.00			
80	15/08/2015	36.3	29.1	0	18	22	14.70	0.00	0.00	0.00			
81	16/08/2015	39.1	32.4	0	18	22	17.75	0.00	0.00	0.00			
82	17/08/2015	39.7	31.8	1	18	22	17.75	0.00	17.75	0.00			
83	18/08/2015	37.5	29.4	1	18	22	15.45	0.00	15.45	0.00			
84	19/08/2015	36.6	29.1	1	18	22	14.85	0.00	14.85	0.00			
85	20/08/2015	36.4	27.9	1	18	22	14.15	0.00	14.15	0.00			
86	21/08/2015	36.1	26.7	1	18	22	13.40	0.00	13.40	0.00			
87	22/08/2015	37.2	27.4	0	18	22	14.30	0.00	0.00	0.00			
88	23/08/2015	36.4	28.3	0	18	22	14.35	0.00	0.00	0.00			
89	24/08/2015	35.6	28.2	1	18	22	13.90	0.00	13.90	0.00			
90	25/08/2015	35.4	27.8	1	18	22	13.60	0.00	13.60	0.00			
91	26/08/2015	34.4	30	1	18	22	14.20	0.00	14.20	0.00			
92	27/08/2015	35.8	29.5	1	18	22	14.65	0.00	14.65	0.00			
93	28/08/2015	35.8	29.6	1	18	22	14.70	0.00	14.70	0.00			

94	29/08/2015	35.7	29.9	0	18	22	14.80	0.00	0.00	0.00			
95	30/08/2015	34.4	29.7	0	18	22	14.05	0.00	0.00	0.00			
96	31/08/2015	36.3	29.8	1	18	22	15.05	0.00	15.05	0.00			
97	01/09/2015	38.5	30.6	1	18	22	16.55	0.00	16.55	0.00			
98	02/09/2015	39.2	28.6	1	18	22	15.90	0.00	15.90	0.00			
99	03/09/2015	36	29.5	1	18	22	14.75	0.00	14.75	0.00			
100	04/09/2015	34.2	26.5	1	18	22	12.35	0.00	12.35	0.00			
101	05/09/2015	35.8	26.3	0	18	22	13.05	0.00	0.00	0.00			
102	06/09/2015	38.6	27.2	0	18	22	14.90	0.00	0.00	0.00			
103	07/09/2015	38.7	29.2	1	18	22	15.95	0.00	15.95	0.00			
104	08/09/2015	40.3	31	1	18	22	17.65	0.00	17.65	0.00			
105	09/09/2015	40.2	28.6	1	18	22	16.40	0.00	16.40	0.00			
106	10/09/2015	39.7	28.5	1	18	22	16.10	0.00	16.10	0.00			
107	11/09/2015	40.6	28.7	1	18	22	16.65	0.00	16.65	0.00			
108	12/09/2015	40.8	30.1	0	18	22	17.45	0.00	0.00	0.00			
109	13/09/2015	35.6	28.3	0	18	22	13.95	0.00	0.00	0.00			
110	14/09/2015	35.8	26.8	1	18	22	13.30	0.00	13.30	0.00			
111	15/09/2015	36.4	26.8	1	18	22	13.60	0.00	13.60	0.00			
112	16/09/2015	35.3	26.8	1	18	22	13.05	0.00	13.05	0.00			
113	17/09/2015	33.4	26.8	1	18	22	12.10	0.00	12.10	0.00			
114	18/09/2015	32.7	26.3	1	18	22	11.50	0.00	11.50	0.00			
115	19/09/2015	31.8	26	0	18	22	10.90	0.00	0.00	0.00			
116	20/09/2015	31.1	26	0	18	22	10.55	0.00	0.00	0.00			
117	21/09/2015	30.1	24.8	1	18	22	9.45	0.00	9.45	0.00			
118	22/09/2015	32.2	25.5	1	18	22	10.85	0.00	10.85	0.00			
119	23/09/2015	30.7	25.6	1	18	22	10.15	0.00	10.15	0.00	688.70	0.00	7683.2

120	24/09/2015	31.4	22.2	1	18	22	8.80	0.00	8.80	0.00			
121	25/09/2015	31.5	25	1	18	22	10.25	0.00	10.25	0.00			
122	26/09/2015	30.1	24.8	0	18	22	9.45	0.00	0.00	0.00			
123	27/09/2015	30.5	24.6	0	18	22	9.55	0.00	0.00	0.00			
124	28/09/2015	32.8	25.1	1	18	22	10.95	0.00	10.95	0.00			
125	29/09/2015	30.9	25.2	1	18	22	10.05	0.00	10.05	0.00			
126	30/09/2015	29.1	23.5	1	18	22	8.30	0.00	8.30	0.00			
127	01/10/2015	29.1	24.6	0	18	22	8.85	0.00	0.00	0.00			
128	02/10/2015	30.8	26.1	1	18	22	10.45	0.00	10.45	0.00			
129	03/10/2015	33.3	25.9	0	18	22	11.60	0.00	0.00	0.00			
130	04/10/2015	31.2	25.2	0	18	22	10.20	0.00	0.00	0.00			
131	05/10/2015	31.4	23.5	1	18	22	9.45	0.00	9.45	0.00			
132	06/10/2015	29.1	23.3	1	18	22	8.20	0.00	8.20	0.00			
133	07/10/2015	28.2	22.5	1	18	22	7.35	0.00	7.35	0.00			
134	08/10/2015	27.7	23.3	1	18	22	7.50	0.00	7.50	0.00			
135	09/10/2015	29.3	22.5	1	18	22	7.90	0.00	7.90	0.00			
136	10/10/2015	30.6	22.9	0	18	22	8.75	0.00	0.00	0.00			
137	11/10/2015	31.4	22.8	0	18	22	9.10	0.00	0.00	0.00			
138	12/10/2015	34.1	24.7	1	18	22	11.40	0.00	11.40	0.00			
139	13/10/2015	29.7	23.5	1	18	22	8.60	0.00	8.60	0.00			
140	14/10/2015	28.3	23.2	1	18	22	7.75	0.00	7.75	0.00			
141	15/10/2015	29.2	23.2	1	18	22	8.20	0.00	8.20	0.00			
142	16/10/2015	31.4	23.8	1	18	22	9.60	0.00	9.60	0.00			
143	17/10/2015	32.5	24.7	0	18	22	10.60	0.00	0.00	0.00			
144	18/10/2015	32.2	23.4	0	18	22	9.80	0.00	0.00	0.00			
145	19/10/2015	31.5	22.2	1	18	22	8.85	0.00	8.85	0.00			

146	20/10/2015	29.8	22.3	1	18	22	8.05	0.00	8.05	0.00			
147	21/10/2015	30.6	21.3	1	18	22	7.95	0.18	7.95	0.18			
148	22/10/2015	25.3	19.3	1	18	22	4.30	0.68	4.30	0.68			
149	23/10/2015	27.2	21.3	1	18	22	6.25	0.18	6.25	0.18			
150	24/10/2015	25.1	19.8	0	18	22	4.45	0.55	0.00	0.00			
151	25/10/2015	24.2	17.3	0	18	22	2.93	1.80	0.00	0.00			
152	26/10/2015	24.3	17.8	1	18	22	3.10	1.53	3.10	1.53			
153	27/10/2015	24.6	20.1	1	18	22	4.35	0.48	4.35	0.48			
154	28/10/2015	23.8	18.5	0	18	22	3.15	1.30	0.00	0.00			
155	29/10/2015	21	15.7	1	18	22	0.93	3.65	0.93	3.65			
156	30/10/2015	24.2	18.8	1	18	22	3.50	1.05	3.50	1.05			
157	31/10/2015	25.2	19.3	0	18	22	4.25	0.68	0.00	0.00			1847.6
158	01/11/2015	24	18.1	0	18	22	3.05	1.45	0.00	0.00			
159	02/11/2015	23	18.6	1	18	22	2.80	1.45	2.80	1.45			
160	03/11/2015	24.2	20.2	1	18	22	4.20	0.45	4.20	0.45			
161	04/11/2015	23	15.8	1	18	22	1.95	2.85	1.95	2.85			
162	05/11/2015	24.2	19.9	1	18	22	4.05	0.53	4.05	0.53			
163	06/11/2015	25.2	17.7	1	18	22	3.53	1.35	3.53	1.35			
164	07/11/2015	26	17.9	0	18	22	3.98	1.05	0.00	0.00			
165	08/11/2015	25.2	18.1	0	18	22	3.65	1.15	0.00	0.00			
166	09/11/2015	23.5	17.9	1	18	22	2.73	1.68	2.73	1.68			
167	10/11/2015	20.1	17.6	1	18	22	0.95	3.15	0.95	3.15			
168	11/11/2015	22	13.7	1	18	22	1.00	4.15	1.00	4.15			
169	12/11/2015	24.9	16.7	1	18	22	3.13	1.93	3.13	1.93			
170	13/11/2015	24.8	18.2	1	18	22	3.50	1.20	3.50	1.20			
171	14/11/2015	26.2	17.4	0	18	22	3.95	1.25	0.00	0.00			

172	15/11/2015	22	13.7	0	18	22	1.00	4.15	0.00	0.00			
173	16/11/2015	24.1	16	1	18	22	2.55	2.48	2.55	2.48			
174	17/11/2015	22.5	15.3	1	18	22	1.58	3.23	1.58	3.23			
175	18/11/2015	23.2	14.6	1	18	22	1.75	3.40	1.75	3.40			
176	19/11/2015	23.7	15.1	1	18	22	2.13	3.03	2.13	3.03			
177	20/11/2015	23.6	13.6	1	18	22	1.70	3.80	1.70	3.80			
178	21/11/2015	21.4	12.4	0	18	22	0.85	5.10	0.00	0.00			
179	22/11/2015	22.1	14	0	18	22	1.05	3.98	0.00	0.00			
180	23/11/2015	22.6	13.7	1	18	22	1.23	4.00	1.23	4.00			
181	24/11/2015	26.9	15	1	18	22	3.70	2.28	3.70	2.28	42.45	40.93	1430.4
182	25/11/2015	22	11.6	1	18	22	1.00	5.20	1.00	5.20			
183	26/11/2015	25.5	13.7	1	18	22	2.68	3.28	2.68	3.28			
184	27/11/2015	22	14.3	1	18	22	1.08	3.85	1.08	3.85			
185	28/11/2015	24.2	13.4	0	18	22	1.95	3.75	0.00	0.00			
186	29/11/2015	22	12.8	0	18	22	1.00	4.60	0.00	0.00			
187	30/11/2015	17.7	10.5	1	18	22	0.00	7.90	0.00	7.90			
188	01/12/2015	18.8	12.1	1	18	22	0.20	6.55	0.20	6.55			
189	02/12/2015	21.2	12.3	1	18	22	0.80	5.25	0.80	5.25			
190	03/12/2015	14.1	10.4	1	18	22	0.00	9.75	0.00	9.75			
191	04/12/2015	14.2	7.3	1	18	22	0.00	11.25	0.00	11.25			
192	05/12/2015	13.5	10.3	0	18	22	0.00	10.10	0.00	0.00			
193	06/12/2015	18	8.7	0	18	22	0.00	8.65	0.00	0.00			
194	07/12/2015	21.5	11.8	1	18	22	0.88	5.35	0.88	5.35			
195	08/12/2015	13.5	8.5	1	18	22	0.00	11.00	0.00	11.00			
196	09/12/2015	21.3	9.7	1	18	22	0.83	6.50	0.83	6.50			
197	10/12/2015	19.5	9.9	1	18	22	0.38	7.30	0.38	7.30			

198	11/12/2015	20.2	8.1	1	18	22	0.55	7.85	0.55	7.85			
199	12/12/2015	12.5	8.8	0	18	22	0.00	11.35	0.00	0.00			
200	13/12/2015	17	10.7	0	18	22	0.00	8.15	0.00	0.00			
201	14/12/2015	18.9	9.2	1	18	22	0.23	7.95	0.23	7.95			
202	15/12/2015	19.1	9	1	18	22	0.28	7.95	0.28	7.95			
203	16/12/2015	18	8.2	1	18	22	0.00	8.90	0.00	8.90			
204	17/12/2015	13.1	11.2	1	18	22	0.00	9.85	0.00	9.85			
205	18/12/2015	13.7	11.7	1	18	22	0.00	9.30	0.00	9.30			
206	19/12/2015	15.6	11.6	0	18	22	0.00	8.40	0.00	0.00			
207	20/12/2015	17.9	8.3	0	18	22	0.00	8.90	0.00	0.00			
208	21/12/2015	18.1	8.7	1	18	22	0.03	8.60	0.03	8.60			
209	22/12/2015	18.7	8.4	1	18	22	0.18	8.45	0.18	8.45			
210	23/12/2015	18	8.7	1	18	22	0.00	8.65	0.00	8.65			
211	24/12/2015	17.9	10.8	0	18	22	0.00	7.65	0.00	0.00			
212	25/12/2015	19.5	9.9	0	18	22	0.38	7.30	0.00	0.00			
213	26/12/2015	19.6	8.1	0	18	22	0.40	8.15	0.00	0.00			
214	27/12/2015	19.6	8.1	0	18	22	0.40	8.15	0.00	0.00			
215	28/12/2015	19.6	8.1	1	18	22	0.40	8.15	0.40	8.15			
216	29/12/2015	18.1	8.1	1	18	22	0.03	8.90	0.03	8.90			
217	30/12/2015	15.7	7.8	1	18	22	0.00	10.25	0.00	10.25			
218	31/12/2015	8	7.3	1	18	22	0.00	14.35	0.00	14.35			

219	01/01/2016	5.6	2.5	0	18	22	0.00	17.95	0.00	0.00			
220	02/01/2016	8.7	1.4	0	18	22	0.00	16.95	0.00	0.00			
221	03/01/2016	11.5	4.6	0	18	22	0.00	13.95	0.00	0.00			
222	04/01/2016	10.8	6.1	1	18	22	0.00	13.55	0.00	13.55			
223	05/01/2016	13	10	1	18	22	0.00	10.50	0.00	10.50			
224	06/01/2016	21.2	10.5	0	18	22	0.80	6.15	0.00	0.00			
225	07/01/2016	17.2	15.7	1	18	22	0.00	5.55	0.00	5.55			
226	08/01/2016	16.4	13.2	1	18	22	0.00	7.20	0.00	7.20			
227	09/01/2016	15.9	8.8	0	18	22	0.00	9.65	0.00	0.00			
228	10/01/2016	17.7	6.4	0	18	22	0.00	9.95	0.00	0.00			
229	11/01/2016	13.6	10.2	1	18	22	0.00	10.10	0.00	10.10			
230	12/01/2016	18	10	1	18	22	0.00	8.00	0.00	8.00			
231	13/01/2016	20.2	7.8	1	18	22	0.55	8.00	0.55	8.00			
232	14/01/2016	18.2	10.3	1	18	22	0.05	7.75	0.05	7.75			
233	15/01/2016	17.8	6.5	1	18	22	0.00	9.85	0.00	9.85			
234	16/01/2016	17.1	5.8	0	18	22	0.00	10.55	0.00	0.00			
235	17/01/2016	18.1	8.3	0	18	22	0.03	8.80	0.00	0.00			
236	18/01/2016	12.1	12.2	1	18	22	0.00	9.85	0.00	9.85			
237	19/01/2016	13.6	7.6	1	18	22	0.00	11.40	0.00	11.40			
238	20/01/2016	13.2	7.2	1	18	22	0.00	11.80	0.00	11.80			
239	21/01/2016	14.5	5	1	18	22	0.00	12.25	0.00	12.25			
240	22/01/2016	16.7	7.2	1	18	22	0.00	10.05	0.00	10.05			
241	23/01/2016	14.3	7.8	0	18	22	0.00	10.95	0.00	0.00			
242	24/01/2016	9.2	6.1	0	18	22	0.00	14.35	0.00	0.00			
243	25/01/2016	5.8	4.1	1	18	22	0.00	17.05	0.00	17.05			
244	26/01/2016	8.9	0.9	1	18	22	0.00	17.10	0.00	17.10			
245	27/01/2016	9.6	0.4	1	18	22	0.00	17.00	0.00	17.00	10.10	389.33	6185
246	28/01/2016	12.2	1.9	1	18	22	0.00	14.95	0.00	14.95			
247	29/01/2016	16.6	10.3	1	18	22	0.00	8.55	0.00	8.55			

248	30/01/2016	18	6.8	0	18	22	0.00	9.60	0.00	0.00			
249	31/01/2016	19.1	8.4	0	18	22	0.28	8.25	0.00	0.00			
250	01/02/2016	17.9	8.3	1	18	22	0.00	8.90	0.00	8.90			
251	02/02/2016	19.1	12	1	18	22	0.28	6.45	0.28	6.45			
252	03/02/2016	20.2	7.8	1	18	22	0.55	8.00	0.55	8.00			
253	04/02/2016	18.8	8	1	18	22	0.20	8.60	0.20	8.60			
254	05/02/2016	19	10.8	1	18	22	0.25	7.10	0.25	7.10			
255	06/02/2016	19	9.9	0	18	22	0.25	7.55	0.00	0.00			
256	07/02/2016	13.8	9	0	18	22	0.00	10.60	0.00	0.00			
257	08/02/2016	15	5.3	1	18	22	0.00	11.85	0.00	11.85			
258	09/02/2016	15.3	5.9	1	18	22	0.00	11.40	0.00	11.40			
259	10/02/2016	14.6	8.7	1	18	22	0.00	10.35	0.00	10.35			
260	11/02/2016	13.5	6.8	1	18	22	0.00	11.85	0.00	11.85			
261	12/02/2016	21	8.1	1	18	22	0.75	7.45	0.75	7.45			
262	13/02/2016	20.1	9.7	0	18	22	0.53	7.10	0.00	0.00			
263	14/02/2016	18.9	9.3	0	18	22	0.23	7.90	0.00	0.00			
264	15/02/2016	21.9	13.7	1	18	22	0.98	4.20	0.98	4.20			
265	16/02/2016	25.6	12.5	1	18	22	2.43	3.85	2.43	3.85			
266	17/02/2016	26	17	1	18	22	3.75	1.50	3.75	1.50			
267	18/02/2016	26	14.5	1	18	22	3.13	2.75	3.13	2.75			
268	19/02/2016	27.3	12.5	1	18	22	3.28	3.43	3.28	3.43			
269	20/02/2016	24.4	15.5	0	18	22	2.58	2.65	0.00	0.00			
270	21/02/2016	10.6	12.7	0	18	22	0.00	10.35	0.00	0.00			
271	22/02/2016	15.3	13.3	1	18	22	0.00	7.70	0.00	7.70			
272	23/02/2016	20.6	11.4	1	18	22	0.65	6.00	0.65	6.00			
273	24/02/2016	21.1	9.7	1	18	22	0.78	6.60	0.78	6.60			
274	25/02/2016	10.6	10.5	1	18	22	0.00	11.45	0.00	11.45			
275	26/02/2016	22.9	13.3	1	18	22	1.28	4.13	1.28	4.13			
276	27/02/2016	23.2	14.7	0	18	22	1.78	3.35	0.00	0.00			
277	28/02/2016	21.9	12.1	0	18	22	0.98	5.00	0.00	0.00			

278	29/02/2016	25.3	11.9	1	18	22	2.13	4.23	2.13	4.23			
279	01/03/2016	27	16.4	1	18	22	4.10	1.55	4.10	1.55			
280	02/03/2016	23	17.1	1	18	22	2.28	2.20	2.28	2.20			
281	03/03/2016	21	16.2	1	18	22	1.05	3.40	1.05	3.40			
282	04/03/2016	19.4	12	1	18	22	0.35	6.30	0.35	6.30			
283	05/03/2016	18.6	16	0	18	22	0.15	4.70	0.00	0.00			
284	06/03/2016	21.1	12.5	0	18	22	0.78	5.20	0.00	0.00			
285	07/03/2016	22.2	12.4	1	18	22	1.05	4.75	1.05	4.75			
286	08/03/2016	24.5	13.5	1	18	22	2.13	3.63	2.13	3.63			
287	09/03/2016	24.5	15.4	1	18	22	2.60	2.68	2.60	2.68			
288	10/03/2016	21.7	16.1	1	18	22	1.38	3.10	1.38	3.10			
289	11/03/2016	20.7	13.9	1	18	22	0.68	4.70	0.68	4.70			
290	12/03/2016	22.4	12.1	0	18	22	1.10	4.85	0.00	0.00			
291	13/03/2016	24.9	16.2	0	18	22	3.00	2.18	0.00	0.00			
292	14/03/2016	19.7	16.2	0	18	22	0.43	4.05	0.00	0.00			
293	15/03/2016	17.7	14.4	1	18	22	0.00	5.95	0.00	5.95			
294	16/03/2016	17.2	13.9	1	18	22	0.00	6.45	0.00	6.45			
295	17/03/2016	17.3	9.3	1	18	22	0.00	8.70	0.00	8.70			
296	18/03/2016	18.7	11.3	1	18	22	0.18	7.00	0.18	7.00			
297	19/03/2016	19.3	11.6	0	18	22	0.33	6.55	0.00	0.00			
298	20/03/2016	19.2	14.8	0	18	22	0.30	5.00	0.00	0.00			
299	21/03/2016	18.3	13.6	1	18	22	0.08	6.05	0.08	6.05			
300	22/03/2016	21.5	14.9	1	18	22	0.98	3.80	0.98	3.80			
301	23/03/2016	22.9	13.3	1	18	22	1.28	4.13	1.28	4.13			
302	24/03/2016	27.2	16.7	1	18	22	4.28	1.35	4.28	1.35	46.55	268.95	6604
303	25/03/2016	20.1	13.5	0	18	22	0.53	5.20	0.00	0.00			
304	26/03/2016	19.6	12.8	0	18	22	0.40	5.80	0.00	0.00			
305	27/03/2016	21.1	13.8	0	18	22	0.78	4.55	0.00	0.00			
306	28/03/2016	16.8	10.8	1	18	22	0.00	8.20	0.00	8.20			
307	29/03/2016	19.3	10.7	1	18	22	0.33	7.00	0.33	7.00			

308	30/03/2016	20.7	14.3	1	18	22	0.68	4.50	0.68	4.50			
309	31/03/2016	24.4	16.3	1	18	22	2.78	2.25	2.78	2.25			
310	01/04/2016	26.5	17.6	0	18	22	4.15	1.10	0.00	0.00			
311	02/04/2016	26.8	17.1	0	18	22	4.18	1.25	0.00	0.00			
312	03/04/2016	28.9	19.1	0	18	22	6.00	0.73	0.00	0.00			
313	04/04/2016	28.8	21.7	1	18	22	7.25	0.08	7.25	0.08			
314	05/04/2016	29.2	21	1	18	22	7.10	0.25	7.10	0.25			
315	06/04/2016	30.2	22.1	1	18	22	8.15	0.00	8.15	0.00			
316	07/04/2016	30.3	20.4	1	18	22	7.35	0.40	7.35	0.40			
317	08/04/2016	28.4	19.7	1	18	22	6.05	0.58	6.05	0.58			
318	09/04/2016	31.4	21.7	0	18	22	8.55	0.08	0.00	0.00			
319	10/04/2016	24.7	18.4	0	18	22	3.55	1.13	0.00	0.00			
320	11/04/2016	23.7	19.9	1	18	22	3.80	0.63	3.80	0.63			
321	12/04/2016	19.1	15.7	1	18	22	0.28	4.60	0.28	4.60			
322	13/04/2016	23	17.1	1	18	22	2.28	2.20	2.28	2.20			
323	14/04/2016	26.5	19.9	1	18	22	5.20	0.53	5.20	0.53			
324	15/04/2016	28.6	19.5	1	18	22	6.05	0.63	6.05	0.63			
325	16/04/2016	28.2	19.6	0	18	22	5.90	0.60	0.00	0.00			
326	17/04/2016	30	18.8	0	18	22	6.40	0.80	0.00	0.00			
327	18/04/2016	30.6	20.6	1	18	22	7.60	0.35	7.60	0.35			
328	19/04/2016	33	22.4	1	18	22	9.70	0.00	9.70	0.00			
329	20/04/2016	34.3	25.7	1	18	22	12.00	0.00	12.00	0.00			
330	21/04/2016	29	24.3	1	18	22	8.65	0.00	8.65	0.00			
331	22/04/2016	27.4	21.9	1	18	22	6.65	0.03	6.65	0.03			
332	23/04/2016	29.9	22.2	0	18	22	8.05	0.00	0.00	0.00			
333	24/04/2016	27.7	20.8	0	18	22	6.25	0.30	0.00	0.00			
334	25/04/2016	26.9	21.4	1	18	22	6.15	0.15	6.15	0.15			
335	26/04/2016	29.5	18.2	1	18	22	5.85	0.95	5.85	0.95			
336	27/04/2016	25.7	20	1	18	22	4.85	0.50	4.85	0.50			
337	28/04/2016	27.2	19.7	1	18	22	5.45	0.58	5.45	0.58			

338	29/04/2016	28.9	20	0	18	22	6.45	0.50	0.00	0.00			
339	30/04/2016	28.4	20.5	0	18	22	6.45	0.38	0.00	0.00			2295
340	01/05/2016	31.8	22.5	0	18	22	9.15	0.00	0.00	0.00			
341	02/05/2016	32.5	24.7	0	18	22	10.60	0.00	0.00	0.00			
342	03/05/2016	26.7	23.7	1	18	22	7.20	0.00	7.20	0.00			
343	04/05/2016	23.6	17.2	1	18	22	2.60	2.00	2.60	2.00			
344	05/05/2016	24.4	20.2	1	18	22	4.30	0.45	4.30	0.45			
345	06/05/2016	21.5	17.1	1	18	22	1.53	2.70	1.53	2.70			
346	07/05/2016	16.3	19.1	0	18	22	0.00	4.30	0.00	0.00			
347	08/05/2016	24	18.1	0	18	22	3.05	1.45	0.00	0.00			
348	09/05/2016	27	20.1	1	18	22	5.55	0.48	5.55	0.48			
349	10/05/2016	29.7	22.6	1	18	22	8.15	0.00	8.15	0.00			
350	11/05/2016	31.2	23.1	1	18	22	9.15	0.00	9.15	0.00			
351	12/05/2016	29.3	22.2	1	18	22	7.75	0.00	7.75	0.00			
352	13/05/2016	31.7	24.8	1	18	22	10.25	0.00	10.25	0.00			
353	14/05/2016	34.1	22.8	0	18	22	10.45	0.00	0.00	0.00			
354	15/05/2016	32	24.5	0	18	22	10.25	0.00	0.00	0.00			
355	16/05/2016	31.2	28.9	1	18	22	12.05	0.00	12.05	0.00			
356	17/05/2016	27.8	24.8	1	18	22	8.30	0.00	8.30	0.00			
357	18/05/2016	26.8	22	1	18	22	6.40	0.00	6.40	0.00			
358	19/05/2016	27.2	22.4	1	18	22	6.80	0.00	6.80	0.00			
359	20/05/2016	28.6	21.1	1	18	22	6.85	0.23	6.85	0.23			
360	21/05/2016	30	22.2	0	18	22	8.10	0.00	0.00	0.00			
361	22/05/2016	33.5	23.2	0	18	22	10.35	0.00	0.00	0.00			
362	23/05/2016	26.1	22	1	18	22	6.05	0.00	6.05	0.00			
363	24/05/2016	27.4	23	1	18	22	7.20	0.00	7.20	0.00			
364	25/05/2016	30.3	22.1	1	18	22	8.20	0.00	8.20	0.00			
365	26/05/2016	26.4	22	1	18	22	6.20	0.00	6.20	0.00	124.53	5.85	1989
366	27/05/2016	19.6	21.6	1	18	22	2.60	1.40	2.60	1.40			
367	28/05/2016	21	21.2	0	18	22	3.10	0.90	0.00	0.00			

368	29/05/2016	28	23.7	0	18	22	7.85	0.00	0.00	0.00			
369	30/05/2016	30.2	25	1	18	22	9.60	0.00	9.60	0.00			
370	31/05/2016	30.7	25.2	1	18	22	9.95	0.00	9.95	0.00			
371	01/06/2016	32.5	25.3	1	18	22	10.90	0.00	10.90	0.00			
372	02/06/2016	35.3	25.2	1	18	22	12.25	0.00	12.25	0.00			
373	03/06/2016	36	25.9	1	18	22	12.95	0.00	12.95	0.00			
374	04/06/2016	33.2	28.1	0	18	22	12.65	0.00	0.00	0.00			
375	05/06/2016	31.3	25	0	18	22	10.15	0.00	0.00	0.00			
376	06/06/2016	32.6	26.5	1	18	22	11.55	0.00	11.55	0.00			
377	07/06/2016	31.6	25.7	1	18	22	10.65	0.00	10.65	0.00			
378	08/06/2016	31.7	25.8	1	18	22	10.75	0.00	10.75	0.00			
379	09/06/2016	28.6	25	1	18	22	8.80	0.00	8.80	0.00			
380	10/06/2016	27.9	24.5	1	18	22	8.20	0.00	8.20	0.00			
381	11/06/2016	27.9	22.9	0	18	22	7.40	0.00	0.00	0.00			
382	12/06/2016	31.5	23.6	0	18	22	9.55	0.00	0.00	0.00			
383	13/06/2016	33.6	24.8	1	18	22	11.20	0.00	11.20	0.00			
384	14/06/2016	35.3	26.9	1	18	22	13.10	0.00	13.10	0.00			
385	15/06/2016	28.8	26.6	1	18	22	9.70	0.00	9.70	0.00			
386	16/06/2016	34.5	29.6	1	18	22	14.05	0.00	14.05	0.00			
387	17/06/2016	34.9	30.7	1	18	22	14.80	0.00	14.80	0.00			
388	18/06/2016	35.6	30.9	0	18	22	15.25	0.00	0.00	0.00			
389	19/06/2016	38.1	33.2	0	18	22	17.65	0.00	0.00	0.00			
390	20/06/2016	39.1	34.2	0	18	22	18.65	0.00	0.00	0.00			
391	21/06/2016	41	35.3	1	18	22	20.15	0.00	20.15	0.00			
392	22/06/2016	40.2	34.4	1	18	22	19.30	0.00	19.30	0.00			
393	23/06/2016	41.4	32.7	1	18	22	19.05	0.00	19.05	0.00			
394	24/06/2016	40.1	31.8	1	18	22	17.95	0.00	17.95	0.00			
395	25/06/2016	37.9	32.2	0	18	22	17.05	0.00	0.00	0.00			
396	26/06/2016	37	31.5	0	18	22	16.25	0.00	0.00	0.00			
397	27/06/2016	31.8	27.5	1	18	22	11.65	0.00	11.65	0.00			

398	28/06/2016	33.9	27.1	1	18	22	12.50	0.00	12.50	0.00			
399	29/06/2016	35.1	28.4	1	18	22	13.75	0.00	13.75	0.00			
400	30/06/2016	34.2	27.4	1	18	22	12.80	0.00	12.80	0.00			
401	01/07/2016	36.6	28.8	1	18	22	14.70	0.00	14.70	0.00			
402	02/07/2016	37.6	31.7	0	18	22	16.65	0.00	0.00	0.00			
403	03/07/2016	38.3	31.6	0	18	22	16.95	0.00	0.00	0.00			
404	04/07/2016	38.1	30.3	1	18	22	16.20	0.00	16.20	0.00			
405	05/07/2016	36.9	32	1	18	22	16.45	0.00	16.45	0.00			
406	06/07/2016	37.4	32.2	1	18	22	16.80	0.00	16.80	0.00			
407	07/07/2016	38.1	32.5	1	18	22	17.30	0.00	17.30	0.00			
408	08/07/2016	36.4	29	1	18	22	14.70	0.00	14.70	0.00			
409	09/07/2016	37.6	30.2	0	18	22	15.90	0.00	0.00	0.00			
410	10/07/2016	38.4	31.3	0	18	22	16.85	0.00	0.00	0.00			
411	11/07/2016	36.6	31.9	1	18	22	16.25	0.00	16.25	0.00			
412	12/07/2016	37.8	31.8	1	18	22	16.80	0.00	16.80	0.00			
413	13/07/2016	39.2	31.9	1	18	22	17.55	0.00	17.55	0.00			
414	14/07/2016	36.1	29.8	1	18	22	14.95	0.00	14.95	0.00			
415	15/07/2016	37.4	29	1	18	22	15.20	0.00	15.20	0.00			
416	16/07/2016	38.1	27.6	0	18	22	14.85	0.00	0.00	0.00			
417	17/07/2016	37.5	29	0	18	22	15.25	0.00	0.00	0.00			
418	18/07/2016	36.3	28.9	1	18	22	14.60	0.00	14.60	0.00			
419	19/07/2016	35.7	27.4	1	18	22	13.55	0.00	13.55	0.00			
420	20/07/2016	34.1	27.9	1	18	22	13.00	0.00	13.00	0.00			
421	21/07/2016	34.3	28.7	1	18	22	13.50	0.00	13.50	0.00			
422	22/07/2016	35.2	27.5	1	18	22	13.35	0.00	13.35	0.00			
423	23/07/2016	36.8	28.9	0	18	22	14.85	0.00	0.00	0.00			
424	24/07/2016	38.4	30.7	0	18	22	16.55	0.00	0.00	0.00			
425	25/07/2016	38.4	32.4	1	18	22	17.40	0.00	17.40	0.00	560.50	1.40	8321
426	26/07/2016	39.3	32.1	1	18	22	17.70	0.00	17.70	0.00			
427	27/07/2016	38.7	28.9	1	18	22	15.80	0.00	15.80	0.00			

428	28/07/2016	37.9	28.9	1	18	22	15.40	0.00	15.40	0.00			
429	29/07/2016	39.7	29.2	1	18	22	16.45	0.00	16.45	0.00			
430	30/07/2016	38.8	32.1	0	18	22	17.45	0.00	0.00	0.00			
431	31/07/2016	38.1	28.9	0	18	22	15.50	0.00	0.00	0.00			
432	01/08/2016	39.7	30.8	1	18	22	17.25	0.00	17.25	0.00			
433	02/08/2016	39.4	30.5	1	18	22	16.95	0.00	16.95	0.00			
434	03/08/2016	39.4	31.1	1	18	22	17.25	0.00	17.25	0.00			
435	04/08/2016	38.4	29.6	1	18	22	16.00	0.00	16.00	0.00			
436	05/08/2016	38.5	29.8	1	18	22	16.15	0.00	16.15	0.00			
437	06/08/2016	37	28.5	0	18	22	14.75	0.00	0.00	0.00			
438	07/08/2016	38.1	30.2	0	18	22	16.15	0.00	0.00	0.00			
439	08/08/2016	39.5	32.4	1	18	22	17.95	0.00	17.95	0.00			
440	09/08/2016	39.4	31	1	18	22	17.20	0.00	17.20	0.00			
441	10/08/2016	37.4	29.2	1	18	22	15.30	0.00	15.30	0.00			
442	11/08/2016	37.5	28.4	1	18	22	14.95	0.00	14.95	0.00			
443	12/08/2016	36.1	27.8	1	18	22	13.95	0.00	13.95	0.00			
444	13/08/2016	37.7	28.3	0	18	22	15.00	0.00	0.00	0.00			
445	14/08/2016	36.6	28.9	0	18	22	14.75	0.00	0.00	0.00			
446	15/08/2016	38.3	29.4	0	18	22	15.85	0.00	0.00	0.00			
447	16/08/2016	34.8	27.2	1	18	22	13.00	0.00	13.00	0.00			
448	17/08/2016	36.1	27.7	1	18	22	13.90	0.00	13.90	0.00			
449	18/08/2016	37.2	29.8	1	18	22	15.50	0.00	15.50	0.00			
450	19/08/2016	38.2	26.7	1	18	22	14.45	0.00	14.45	0.00			
451	20/08/2016	36.8	27.4	0	18	22	14.10	0.00	0.00	0.00			
452	21/08/2016	37.5	28	0	18	22	14.75	0.00	0.00	0.00			
453	22/08/2016	37.3	28.7	1	18	22	15.00	0.00	15.00	0.00			
454	23/08/2016	36.8	28.4	1	18	22	14.60	0.00	14.60	0.00			
455	24/08/2016	37.3	28.7	1	18	22	15.00	0.00	15.00	0.00			
456	25/08/2016	36	27.9	1	18	22	13.95	0.00	13.95	0.00			
457	26/08/2016	35.9	28	1	18	22	13.95	0.00	13.95	0.00			

458	27/08/2016	35	27.6	0	18	22	13.30	0.00	0.00	0.00			
459	28/08/2016	34.3	27.3	0	18	22	12.80	0.00	0.00	0.00			
460	29/08/2016	35.2	27.7	1	18	22	13.45	0.00	13.45	0.00			
461	30/08/2016	35.6	26.9	1	18	22	13.25	0.00	13.25	0.00			
462	31/08/2016	34.1	26.1	1	18	22	12.10	0.00	12.10	0.00			
463	01/09/2016	35.8	27.5	1	18	22	13.65	0.00	13.65	0.00			
464	02/09/2016	36.3	29.4	1	18	22	14.85	0.00	14.85	0.00			
465	03/09/2016	34.5	27.9	0	18	22	13.20	0.00	0.00	0.00			
466	04/09/2016	31.8	26.4	0	18	22	11.10	0.00	0.00	0.00			
467	05/09/2016	34.3	26.4	1	18	22	12.35	0.00	12.35	0.00			
468	06/09/2016	33.7	26.3	1	18	22	12.00	0.00	12.00	0.00			
469	07/09/2016	32.3	26.3	1	18	22	11.30	0.00	11.30	0.00			
470	08/09/2016	36	26.1	1	18	22	13.05	0.00	13.05	0.00			
471	09/09/2016	36.9	26.4	1	18	22	13.65	0.00	13.65	0.00			
472	10/09/2016	37.4	26.5	0	18	22	13.95	0.00	0.00	0.00			
473	11/09/2016	35.4	27.7	0	18	22	13.55	0.00	0.00	0.00			
474	12/09/2016	33	26.4	1	18	22	11.70	0.00	11.70	0.00			
475	13/09/2016	32.5	26	1	18	22	11.25	0.00	11.25	0.00			
476	14/09/2016	31.9	25.8	1	18	22	10.85	0.00	10.85	0.00			
477	15/09/2016	33	25.5	1	18	22	11.25	0.00	11.25	0.00			
478	16/09/2016	31.1	26.2	1	18	22	10.65	0.00	10.65	0.00			
479	17/09/2016	33.3	27.3	0	18	22	12.30	0.00	0.00	0.00			
480	18/09/2016	34.2	27.1	0	18	22	12.65	0.00	0.00	0.00			
481	19/09/2016	34.5	25.9	1	18	22	12.20	0.00	12.20	0.00			
482	20/09/2016	35	26.2	1	18	22	12.60	0.00	12.60	0.00			
483	21/09/2016	31.8	24.8	1	18	22	10.30	0.00	10.30	0.00			
484	22/09/2016	30.4	25.5	1	18	22	9.95	0.00	9.95	0.00			
485	23/09/2016	29.4	25.1	1	18	22	9.25	0.00	9.25	0.00	643.20	0.00	9210.6
486	24/09/2016	26.5	23	0	18	22	6.75	0.00	0.00	0.00			
487	25/09/2016	27.3	23	0	18	22	7.15	0.00	0.00	0.00			

488	26/09/2016	30.1	23.2	1	18	22	8.65	0.00	8.65	0.00			
489	27/09/2016	29.9	22.9	1	18	22	8.40	0.00	8.40	0.00			
490	28/09/2016	30.5	22.9	1	18	22	8.70	0.00	8.70	0.00			
491	29/09/2016	30.9	24.7	1	18	22	9.80	0.00	9.80	0.00			
492	30/09/2016	31.8	24.9	1	18	22	10.35	0.00	10.35	0.00			
493	01/10/2016	31.6	25.2	0	18	22	10.40	0.00	0.00	0.00			
494	02/10/2016	33	25.3	0	18	22	11.15	0.00	0.00	0.00			
495	03/10/2016	35	26.5	1	18	22	12.75	0.00	12.75	0.00			
496	04/10/2016	34.2	26.2	1	18	22	12.20	0.00	12.20	0.00			
497	05/10/2016	32.3	22	1	18	22	9.15	0.00	9.15	0.00			
498	06/10/2016	30.7	22.9	1	18	22	8.80	0.00	8.80	0.00			
499	07/10/2016	30.1	23.3	1	18	22	8.70	0.00	8.70	0.00			
500	08/10/2016	29.8	23.6	0	18	22	8.70	0.00	0.00	0.00			
501	09/10/2016	29.9	22.3	0	18	22	8.10	0.00	0.00	0.00			
502	10/10/2016	30.9	23.4	1	18	22	9.15	0.00	9.15	0.00			
503	11/10/2016	30.9	22.5	1	18	22	8.70	0.00	8.70	0.00			
504	12/10/2016	31.7	22.9	1	18	22	9.30	0.00	9.30	0.00			
505	13/10/2016	32.8	22.8	1	18	22	9.80	0.00	9.80	0.00			
506	14/10/2016	29.9	23.2	1	18	22	8.55	0.00	8.55	0.00			
507	15/10/2016	29.3	22.7	0	18	22	8.00	0.00	0.00	0.00			
508	16/10/2016	28.1	22.3	0	18	22	7.20	0.00	0.00	0.00			
509	17/10/2016	30.4	22.3	1	18	22	8.35	0.00	8.35	0.00			
510	18/10/2016	28.5	21.3	1	18	22	6.90	0.18	6.90	0.18			
511	19/10/2016	28.5	20.6	1	18	22	6.55	0.35	6.55	0.35			
512	20/10/2016	28.2	21.3	1	18	22	6.75	0.18	6.75	0.18			
513	21/10/2016	27.5	20.9	1	18	22	6.20	0.28	6.20	0.28			
514	22/10/2016	28.4	20.5	0	18	22	6.45	0.38	0.00	0.00			
515	23/10/2016	29.2	20.4	0	18	22	6.80	0.40	0.00	0.00			
516	24/10/2016	28.2	20.5	1	18	22	6.35	0.38	6.35	0.38			
517	25/10/2016	27.5	21.9	1	18	22	6.70	0.03	6.70	0.03			

518	26/10/2016	27.7	20.8	1	18	22	6.25	0.30	6.25	0.30			
519	27/10/2016	28.1	19.4	1	18	22	5.75	0.65	5.75	0.65			
520	28/10/2016	29.8	21.4	0	18	22	7.60	0.15	0.00	0.00			
521	29/10/2016	29.6	20.1	0	18	22	6.85	0.48	0.00	0.00			
522	30/10/2016	27.3	20.5	0	18	22	5.90	0.38	0.00	0.00			
523	31/10/2016	26.1	22.6	1	18	22	6.35	0.00	6.35	0.00			2566.8
524	01/11/2016	19.9	16.9	1	18	22	0.67	3.60	0.67	3.60			
525	02/11/2016	19.3	14.8	1	18	22	0.33	4.95	0.33	4.95			
526	03/11/2016	22.4	13.2	1	18	22	1.10	4.30	1.10	4.30			
527	04/11/2016	23.5	14.5	1	18	22	1.88	3.38	1.88	3.38			
528	05/11/2016	24.0	16.2	0	18	22	2.55	2.40	0.00	0.00			
529	06/11/2016	25.1	17.8	0	18	22	3.50	1.33	0.00	0.00			
530	07/11/2016	24.9	14.5	1	18	22	2.58	3.03	2.58	3.03			
531	08/11/2016	25.6	16.4	1	18	22	3.40	1.90	3.40	1.90			
532	09/11/2016	26.4	15.7	1	18	22	3.63	2.05	3.63	2.05			
533	10/11/2016	26.3	18.6	1	18	22	4.45	0.85	4.45	0.85			
534	11/11/2016	24.6	17.2	1	18	22	3.10	1.75	3.10	1.75			
535	12/11/2016	24.7	17.5	0	18	22	3.23	1.58	0.00	0.00			
536	13/11/2016	24.2	16.5	0	18	22	2.73	2.20	0.00	0.00			
537	14/11/2016	25.0	17.8	1	18	22	3.45	1.35	3.45	1.35			
538	15/11/2016	24.3	18.0	1	18	22	3.15	1.43	3.15	1.43			
539	16/11/2016	21.7	15.7	1	18	22	1.28	3.30	1.28	3.30			
540	17/11/2016	19.7	10.1	1	18	22	0.43	7.10	0.43	7.10			
541	18/11/2016	20.2	11.6	1	18	22	0.55	6.10	0.55	6.10			
542	19/11/2016	22.8	13.1	0	18	22	1.20	4.25	0.00	0.00			
543	20/11/2016	23.8	14.3	0	18	22	1.98	3.40	0.00	0.00			
544	21/11/2016	22.3	13.9	1	18	22	1.13	3.98	1.13	3.98			
545	22/11/2016	21.0	14.3	1	18	22	0.75	4.35	0.75	4.35			
546	23/11/2016	20.5	11.8	1	18	22	0.63	5.85	0.63	5.85	32.48	59.25	1904.4
547	24/11/2016	21.6	11.2	1	18	22	0.90	5.60	0.90	5.60			

548	25/11/2016	21.3	9.7	1	18	22	0.83	6.50	0.83	6.50			
549	26/11/2016	20.6	10.7	0	18	22	0.65	6.35	0.00	0.00			
550	27/11/2016	21.0	9.2	0	18	22	0.75	6.90	0.00	0.00			
551	28/11/2016	21.4	9.3	1	18	22	0.85	6.65	0.85	6.65			
552	29/11/2016	17.3	13.8	1	18	22	0.00	6.45	0.00	6.45			
553	30/11/2016	14.6	14.5	1	18	22	0.00	7.45	0.00	7.45			
554	01/12/2016	13.3	11.8	1	18	22	0.00	9.45	0.00	9.45			
555	02/12/2016	14.0	11.6	1	18	22	0.00	9.20	0.00	9.20			
556	03/12/2016	18.7	8.9	0	18	22	0.18	8.20	0.00	0.00			
557	04/12/2016	18.4	10.0	0	18	22	0.10	7.80	0.00	0.00			
558	05/12/2016	18.5	12.2	1	18	22	0.13	6.65	0.13	6.65			
559	06/12/2016	18.1	9.6	1	18	22	0.03	8.15	0.03	8.15			
560	07/12/2016	18.5	8.2	1	18	22	0.13	8.65	0.13	8.65			
561	08/12/2016	14.2	12.3	1	18	22	0.00	8.75	0.00	8.75			
562	09/12/2016	16.3	7.2	1	18	22	0.00	10.25	0.00	10.25			
563	10/12/2016	17.4	9.0	0	18	22	0.00	8.80	0.00	0.00			
564	11/12/2016	19.3	11.9	0	18	22	0.33	6.40	0.00	0.00			
565	12/12/2016	18.7	9.3	1	18	22	0.18	8.00	0.18	8.00			
566	13/12/2016	18.6	11.7	1	18	22	0.15	6.85	0.15	6.85			
567	14/12/2016	10.5	9.5	1	18	22	0.00	12.00	0.00	12.00			
568	15/12/2016	13.1	3.3	1	18	22	0.00	13.80	0.00	13.80			
569	16/12/2016	12.9	5.7	1	18	22	0.00	12.70	0.00	12.70			
570	17/12/2016	8.8	7.0	0	18	22	0.00	14.10	0.00	0.00			
571	18/12/2016	10.5	6.1	0	18	22	0.00	13.70	0.00	0.00			
572	19/12/2016	9.7	2.1	1	18	22	0.00	16.10	0.00	16.10			
573	20/12/2016	13.8	4.4	1	18	22	0.00	12.90	0.00	12.90			
574	21/12/2016	12.5	5.8	1	18	22	0.00	12.85	0.00	12.85			
575	22/12/2016	10.3	7.9	1	18	22	0.00	12.90	0.00	12.90			
576	23/12/2016	11.5	8.7	1	18	22	0.00	11.90	0.00	11.90			
577	24/12/2016	13.6	8.1	0	18	22	0.00	11.15	0.00	0.00			

578	25/12/2016	12.3	9.1	0	18	22	0.00	11.30	0.00	0.00			
579	26/12/2016	12.2	6.3	0	18	22	0.00	12.75	0.00	0.00			
580	27/12/2016	13.1	7.0	1	18	22	0.00	11.95	0.00	11.95			
581	28/12/2016	13.8	5.4	1	18	22	0.00	12.40	0.00	12.40			
582	29/12/2016	15.0	11.7	1	18	22	0.00	8.65	0.00	8.65			
583	30/12/2016	14.6	9.1	1	18	22	0.00	10.15	0.00	10.15			
584	31/12/2016	12.7	6.3	0	18	22	0.00	12.50	0.00	0.00			
585	01/01/2017	13.3	11.8	0	18	22	0.00	9.45	0.00	0.00			
586	02/01/2017	14	11.6	0	18	22	0.00	9.20	0.00	0.00			
587	03/01/2017	18.7	8.9	1	18	22	0.18	8.20	0.18	8.20			
588	04/01/2017	18.4	10	1	18	22	0.10	7.80	0.10	7.80			
589	05/01/2017	18.5	12.2	1	18	22	0.13	6.65	0.13	6.65			
590	06/01/2017	18.1	9.6	0	18	22	0.03	8.15	0.00	0.00			
591	07/01/2017	18.5	8.2	0	18	22	0.13	8.65	0.00	0.00			
592	08/01/2017	14.2	12.3	0	18	22	0.00	8.75	0.00	0.00			
593	09/01/2017	16.3	7.2	1	18	22	0.00	10.25	0.00	10.25			
594	10/01/2017	17.4	9	1	18	22	0.00	8.80	0.00	8.80			
595	11/01/2017	19.3	11.9	1	18	22	0.33	6.40	0.33	6.40			
596	12/01/2017	18.7	9.3	1	18	22	0.18	8.00	0.18	8.00			
597	13/01/2017	18.6	11.7	1	18	22	0.15	6.85	0.15	6.85			
598	14/01/2017	10.5	9.5	0	18	22	0.00	12.00	0.00	0.00			
599	15/01/2017	13.1	3.3	0	18	22	0.00	13.80	0.00	0.00			
600	16/01/2017	12.9	5.7	1	18	22	0.00	12.70	0.00	12.70			
601	17/01/2017	8.8	7	1	18	22	0.00	14.10	0.00	14.10			
602	18/01/2017	10.5	6.1	1	18	22	0.00	13.70	0.00	13.70			
603	19/01/2017	9.7	2.1	1	18	22	0.00	16.10	0.00	16.10			
604	20/01/2017	13.8	4.4	1	18	22	0.00	12.90	0.00	12.90			
605	21/01/2017	12.5	5.8	0	18	22	0.00	12.85	0.00	0.00			
606	22/01/2017	10.3	7.9	0	18	22	0.00	12.90	0.00	0.00			
607	23/01/2017	11.5	8.7	1	18	22	0.00	11.90	0.00	11.90			

608	24/01/2017	13.6	8.1	1	18	22	0.00	11.15	0.00	11.15			
609	25/01/2017	12.3	9.1	1	18	22	0.00	11.30	0.00	11.30	4.23	423.70	7785
610	26/01/2017	12.2	6.3	1	18	22	0.00	12.75	0.00	12.75			
611	27/01/2017	13.1	7	1	18	22	0.00	11.95	0.00	11.95			
612	28/01/2017	13.8	5.4	0	18	22	0.00	12.40	0.00	0.00			
613	29/01/2017	15	11.7	0	18	22	0.00	8.65	0.00	0.00			
614	30/01/2017	14.6	9.1	1	18	22	0.00	10.15	0.00	10.15			
615	31/01/2017	12.7	6.3	1	18	22	0.00	12.50	0.00	12.50			
616	01/02/2017	9.5	2.5	1	18	22	0.00	16.00	0.00	16.00			
617	02/02/2017	14.4	3.3	1	18	22	0.00	13.15	0.00	13.15			
618	03/02/2017	14.7	5.8	1	18	22	0.00	11.75	0.00	11.75			
619	04/02/2017	13.1	6.6	0	18	22	0.00	12.15	0.00	0.00			
620	05/02/2017	16.9	7.2	0	18	22	0.00	9.95	0.00	0.00			
621	06/02/2017	17.4	9.0	1	18	22	0.00	8.80	0.00	8.80			
622	07/02/2017	17.5	9.5	1	18	22	0.00	8.50	0.00	8.50			
623	08/02/2017	18.8	12.6	1	18	22	0.20	6.30	0.20	6.30			
624	09/02/2017	15.7	10.3	1	18	22	0.00	9.00	0.00	9.00			
625	10/02/2017	17.4	9.6	1	18	22	0.00	8.50	0.00	8.50			
626	11/02/2017	14.4	7.6	0	18	22	0.00	11.00	0.00	0.00			
627	12/02/2017	16.2	9.7	0	18	22	0.00	9.05	0.00	0.00			
628	13/02/2017	12.7	7.2	1	18	22	0.00	12.05	0.00	12.05			
629	14/02/2017	10.7	7.7	1	18	22	0.00	12.80	0.00	12.80			
630	15/02/2017	12.0	3.9	1	18	22	0.00	14.05	0.00	14.05			
631	16/02/2017	5.9	6.1	1	18	22	0.00	16.00	0.00	16.00			
632	17/02/2017	12.9	2.6	1	18	22	0.00	14.25	0.00	14.25			
633	18/02/2017	15.1	3.4	0	18	22	0.00	12.75	0.00	0.00			
634	19/02/2017	16.0	5.5	0	18	22	0.00	11.25	0.00	0.00			
635	20/02/2017	16.8	7.1	1	18	22	0.00	10.05	0.00	10.05			
636	21/02/2017	17.1	9.7	1	18	22	0.00	8.60	0.00	8.60			
637	22/02/2017	17.3	9.2	1	18	22	0.00	8.75	0.00	8.75			

638	23/02/2017	19.7	11.2	1	18	22	0.43	6.55	0.43	6.55			
639	24/02/2017	18.3	10.1	1	18	22	0.08	7.80	0.08	7.80			
640	25/02/2017	18.8	9.4	0	18	22	0.20	7.90	0.00	0.00			
641	26/02/2017	19.8	10.1	0	18	22	0.45	7.05	0.00	0.00			
642	27/02/2017	18.3	8.9	0	18	22	0.08	8.40	0.00	0.00			
643	28/02/2017	21.1	12.3	1	18	22	0.78	5.30	0.78	5.30			
644	01/03/2017	21.4	15.1	1	18	22	0.97	3.75	0.97	3.75			
645	02/03/2017	20.9	12.6	1	18	22	0.73	5.25	0.73	5.25			
646	03/03/2017	13.5	10.1	1	18	22	0.00	10.20	0.00	10.20			
647	04/03/2017	20.4	12.3	0	18	22	0.60	5.65	0.00	0.00			
648	05/03/2017	19.6	10.8	0	18	22	0.40	6.80	0.00	0.00			
649	06/03/2017	22.4	12.2	1	18	22	1.10	4.80	1.10	4.80			
650	07/03/2017	21.3	13.7	1	18	22	0.83	4.50	0.83	4.50			
651	08/03/2017	21.4	9.6	1	18	22	0.85	6.50	0.85	6.50			
652	09/03/2017	22.1	13.8	1	18	22	1.03	4.08	1.03	4.08			
653	10/03/2017	16.5	13.3	1	18	22	0.00	7.10	0.00	7.10			
654	11/03/2017	15.3	8.8	0	18	22	0.00	9.95	0.00	0.00			
655	12/03/2017	14.7	15.9	0	18	22	0.00	6.70	0.00	0.00			
656	13/03/2017	17.7	13.7	1	18	22	0.00	6.30	0.00	6.30			
657	14/03/2017	16.7	11.0	1	18	22	0.00	8.15	0.00	8.15			
658	15/03/2017	15.6	11.0	1	18	22	0.00	8.70	0.00	8.70			
659	16/03/2017	16.5	9.9	1	18	22	0.00	8.80	0.00	8.80			
660	17/03/2017	15.6	8.5	1	18	22	0.00	9.95	0.00	9.95			
661	18/03/2017	14.8	10.8	0	18	22	0.00	9.20	0.00	0.00			
662	19/03/2017	18.7	12.6	0	18	22	0.18	6.35	0.00	0.00			
663	20/03/2017	21.3	14.4	1	18	22	0.83	4.15	0.83	4.15			
664	21/03/2017	22.2	14.5	1	18	22	1.23	3.70	1.23	3.70			
665	22/03/2017	17.1	12.9	1	18	22	0.00	7.00	0.00	7.00			
666	23/03/2017	19.2	13.6	1	18	22	0.30	5.60	0.30	5.60	16.45	377.20	6927.5
667	24/03/2017	22.8	15.7	1	18	22	1.83	2.95	1.83	2.95			

668	25/03/2017	24.6	16.5	0	18	22	2.93	2.10	0.00	0.00			
669	26/03/2017	23.9	13.6	0	18	22	1.85	3.73	0.00	0.00			
670	27/03/2017	21.2	14.2	1	18	22	0.80	4.30	0.80	4.30			
671	28/03/2017	21.0	13.9	1	18	22	0.75	4.55	0.75	4.55			
672	29/03/2017	22.6	14.8	1	18	22	1.50	3.45	1.50	3.45			
673	30/03/2017	23.3	16.1	1	18	22	2.18	2.63	2.18	2.63			
674	31/03/2017	18.3	15.2	1	18	22	0.08	5.25	0.08	5.25			
675	01/04/2017	18.3	12.6	0	18	22	0.08	6.55	0.00	0.00			
676	02/04/2017	19.7	15.3	0	18	22	0.43	4.50	0.00	0.00			
677	03/04/2017	24.2	16.1	1	18	22	2.63	2.40	2.63	2.40			
678	04/04/2017	23.7	16.0	1	18	22	2.35	2.58	2.35	2.58			
679	05/04/2017	26.5	19.6	1	18	22	5.05	0.60	5.05	0.60			
680	06/04/2017	26.8	19.2	1	18	22	5.00	0.70	5.00	0.70			
681	07/04/2017	24.0	17.2	1	18	22	2.80	1.90	2.80	1.90			
682	08/04/2017	20.4	14.1	0	18	22	0.60	4.75	0.00	0.00			
683	09/04/2017	20.2	15.7	0	18	22	0.55	4.05	0.00	0.00			
684	10/04/2017	18.6	15.3	1	18	22	0.15	5.05	0.15	5.05			
685	11/04/2017	20.7	16.7	1	18	22	1.03	3.30	1.03	3.30			
686	12/04/2017	22.1	16.8	1	18	22	1.75	2.58	1.75	2.58			
687	13/04/2017	17.4	14.3	1	18	22	0.00	6.15	0.00	6.15			
688	14/04/2017	21.5	17.2	0	18	22	1.55	2.65	0.00	0.00			
689	15/04/2017	21.7	15.3	0	18	22	1.18	3.50	0.00	0.00			
690	16/04/2017	24.1	16.0	0	18	22	2.55	2.48	0.00	0.00			
691	17/04/2017	24.4	16.6	0	18	22	2.85	2.10	0.00	0.00			
692	18/04/2017	23.9	15.7	1	18	22	2.38	2.68	2.38	2.68			
693	19/04/2017	23.1	16.5	1	18	22	2.18	2.48	2.18	2.48			
694	20/04/2017	25.3	16.8	1	18	22	3.35	1.78	3.35	1.78			
695	21/04/2017	26.6	16.3	1	18	22	3.88	1.70	3.88	1.70			
696	22/04/2017	31.6	19.4	0	18	22	7.50	0.65	0.00	0.00			
697	23/04/2017	18.1	17.0	0	18	22	0.03	4.45	0.00	0.00			

698	24/04/2017	23.5	16.5	1	18	22	2.38	2.38	2.38	2.38			
699	25/04/2017	24.0	18.3	1	18	22	3.15	1.35	3.15	1.35			
700	26/04/2017	25.5	19.9	1	18	22	4.70	0.53	4.70	0.53			
701	27/04/2017	29.0	21.3	1	18	22	7.15	0.18	7.15	0.18			
702	28/04/2017	30.6	23.8	1	18	22	9.20	0.00	9.20	0.00			
703	29/04/2017	30.3	23.1	0	18	22	8.70	0.00	0.00	0.00			
704	30/04/2017	30.8	23.7	0	18	22	9.25	0.00	0.00	0.00			2655
705	01/05/2017	26.9	24.0	0	18	22	7.45	0.00	0.00	0.00			
706	02/05/2017	26.9	18.7	1	18	22	4.80	0.83	4.80	0.83			
707	03/05/2017	28.1	20.6	1	18	22	6.35	0.35	6.35	0.35			
708	04/05/2017	28.0	20.0	1	18	22	6.00	0.50	6.00	0.50			
709	05/05/2017	25.2	19.7	1	18	22	4.45	0.58	4.45	0.58			
710	06/05/2017	26.6	19.8	0	18	22	5.20	0.55	0.00	0.00			
711	07/05/2017	26.5	19.6	0	18	22	5.05	0.60	0.00	0.00			
712	08/05/2017	30.7	22.2	1	18	22	8.45	0.00	8.45	0.00			
713	09/05/2017	30.7	21.5	1	18	22	8.10	0.13	8.10	0.13			
714	10/05/2017	34.6	26.0	1	18	22	12.30	0.00	12.30	0.00			
715	11/05/2017	29.3	22.6	1	18	22	7.95	0.00	7.95	0.00			
716	12/05/2017	30.9	24.2	1	18	22	9.55	0.00	9.55	0.00			
717	13/05/2017	35.0	26.4	0	18	22	12.70	0.00	0.00	0.00			
718	14/05/2017	36.5	24.5	0	18	22	12.50	0.00	0.00	0.00			
719	15/05/2017	32.8	26.0	1	18	22	11.40	0.00	11.40	0.00			
720	16/05/2017	29.4	25.9	1	18	22	9.65	0.00	9.65	0.00			
721	17/05/2017	32.1	26.6	1	18	22	11.35	0.00	11.35	0.00			
722	18/05/2017	24.7	22.1	1	18	22	5.40	0.00	5.40	0.00			
723	19/05/2017	25.9	21.7	1	18	22	5.80	0.08	5.80	0.08			
724	20/05/2017	25.3	20.8	0	18	22	5.05	0.30	0.00	0.00			
725	21/05/2017	27.8	22.3	0	18	22	7.05	0.00	0.00	0.00			
726	22/05/2017	23.5	19.4	1	18	22	3.45	0.93	3.45	0.93			
727	23/05/2017	23.8	20.4	1	18	22	4.10	0.40	4.10	0.40			

728	24/05/2017	28.0	24.1	1	18	22	8.05	0.00	8.05	0.00	127.15	3.78	2124
729	25/05/2017	27.5	22.9	1	18	22	7.20	0.00	7.20	0.00			
730	26/05/2017	27.9	22.3	1	18	22	7.10	0.00	7.10	0.00			
731	27/05/2017	28.8	22.9	0	18	22	7.85	0.00	0.00	0.00			
732	28/05/2017	30.1	22.6	0	18	22	8.35	0.00	0.00	0.00			
733	29/05/2017	28.3	22.2	1	18	22	7.25	0.00	7.25	0.00			
734	30/05/2017	27.4	22.2	1	18	22	6.80	0.00	6.80	0.00			
735	31/05/2017	27.5	22.2	1	18	22	6.85	0.00	6.85	0.00			
736	01/06/2017	30.0	24.0	1	18	22	9.00	0.00	9.00	0.00			
737	02/06/2017	32.4	26.9	1	18	22	11.65	0.00	11.65	0.00			
738	03/06/2017	33.8	27.6	0	18	22	12.70	0.00	0.00	0.00			
739	04/06/2017	34.7	26.5	0	18	22	12.60	0.00	0.00	0.00			
740	05/06/2017	33.9	25.5	0	18	22	11.70	0.00	0.00	0.00			
741	06/06/2017	31.8	25.8	1	18	22	10.80	0.00	10.80	0.00			
742	07/06/2017	34.8	25.5	1	18	22	12.15	0.00	12.15	0.00			
743	08/06/2017	36.3	27.4	1	18	22	13.85	0.00	13.85	0.00			
744	09/06/2017	37.5	28.6	1	18	22	15.05	0.00	15.05	0.00			
745	10/06/2017	32.5	26.2	0	18	22	11.35	0.00	0.00	0.00			
746	11/06/2017	32.5	25.3	0	18	22	10.90	0.00	0.00	0.00			
747	12/06/2017	33.2	24.6	1	18	22	10.90	0.00	10.90	0.00			
748	13/06/2017	31.2	25.5	1	18	22	10.35	0.00	10.35	0.00			
749	14/06/2017	30.0	24.7	1	18	22	9.35	0.00	9.35	0.00			
750	15/06/2017	34.6	26.6	1	18	22	12.60	0.00	12.60	0.00			
751	16/06/2017	35.0	29.5	1	18	22	14.25	0.00	14.25	0.00			
752	17/06/2017	34.8	28.4	0	18	22	13.60	0.00	0.00	0.00			
753	18/06/2017	32.2	27.4	0	18	22	11.80	0.00	0.00	0.00			
754	19/06/2017	30.6	26.8	1	18	22	10.70	0.00	10.70	0.00			
755	20/06/2017	30.5	24.9	1	18	22	9.70	0.00	9.70	0.00			
756	21/06/2017	25.4	24.8	1	18	22	7.10	0.00	7.10	0.00			
757	22/06/2017	32.1	27.1	1	18	22	11.60	0.00	11.60	0.00			

758	23/06/2017	34.8	28.6	1	18	22	13.70	0.00	13.70	0.00			
759	24/06/2017	37.5	30.3	0	18	22	15.90	0.00	0.00	0.00			
760	25/06/2017	38.4	32.1	0	18	22	17.25	0.00	0.00	0.00			
761	26/06/2017	29.3	32.4	1	18	22	12.85	0.00	12.85	0.00			
762	27/06/2017	38.8	29.3	1	18	22	16.05	0.00	16.05	0.00			
763	28/06/2017	37.6	29.2	1	18	22	15.40	0.00	15.40	0.00			
764	29/06/2017	38.6	26.8	1	18	22	14.70	0.00	14.70	0.00			
765	30/06/2017	39.9	33.0	1	18	22	18.45	0.00	18.45	0.00			
766	01/07/2017	40.7	36.2	0	18	22	20.45	0.00	0.00	0.00			
767	02/07/2017	44.4	37.4	0	18	22	22.90	0.00	0.00	0.00			
768	03/07/2017	43.8	35.1	1	18	22	21.45	0.00	21.45	0.00			
769	04/07/2017	40.2	31.7	1	18	22	17.95	0.00	17.95	0.00			
770	05/07/2017	38.2	30.0	1	18	22	16.10	0.00	16.10	0.00			
771	06/07/2017	36.3	28.2	1	18	22	14.25	0.00	14.25	0.00			
772	07/07/2017	37.1	30.9	1	18	22	16.00	0.00	16.00	0.00			
773	08/07/2017	36.1	32.0	0	18	22	16.05	0.00	0.00	0.00			
774	09/07/2017	38.0	31.7	0	18	22	16.85	0.00	0.00	0.00			
775	10/07/2017	39.7	32.1	1	18	22	17.90	0.00	17.90	0.00			
776	11/07/2017	40.8	32.1	1	18	22	18.45	0.00	18.45	0.00			
777	12/07/2017	41.0	32.6	1	18	22	18.80	0.00	18.80	0.00			
778	13/07/2017	41.4	32.6	1	18	22	19.00	0.00	19.00	0.00			
779	14/07/2017	39.3	29.2	1	18	22	16.25	0.00	16.25	0.00			
780	15/07/2017	38.8	28.5	0	18	22	15.65	0.00	0.00	0.00			
781	16/07/2017	38.1	28.1	0	18	22	15.10	0.00	0.00	0.00			
782	17/07/2017	36.6	29.6	1	18	22	15.10	0.00	15.10	0.00			
783	18/07/2017	37.0	31.5	1	18	22	16.25	0.00	16.25	0.00			
784	19/07/2017	35.4	29.8	1	18	22	14.60	0.00	14.60	0.00			
785	20/07/2017	36.0	28.4	1	18	22	14.20	0.00	14.20	0.00			
786	21/07/2017	35.4	28.5	1	18	22	13.95	0.00	13.95	0.00			
787	22/07/2017	36.3	28.3	0	18	22	14.30	0.00	0.00	0.00			

788	23/07/2017	37.2	28.9	0	18	22	15.05	0.00	0.00	0.00			
789	24/07/2017	39.9	31.6	1	18	22	17.75	0.00	17.75	0.00			
790	25/07/2017	40.2	32.4	1	18	22	18.30	0.00	18.30	0.00	581.70	0.00	8496
791	26/07/2017	41.4	33.0	1	18	22	19.20	0.00	19.20	0.00			
792	27/07/2017	38.7	32.4	1	18	22	17.55	0.00	17.55	0.00			
793	28/07/2017	33.7	28.1	1	18	22	12.90	0.00	12.90	0.00			
794	29/07/2017	35.5	28.4	0	18	22	13.95	0.00	0.00	0.00			
795	30/07/2017	38.0	31.4	0	18	22	16.70	0.00	0.00	0.00			
796	31/07/2017	39.6	32.1	1	18	22	17.85	0.00	17.85	0.00			
797	01/08/2017	40.2	30.7	1	18	22	17.45	0.00	17.45	0.00			
798	02/08/2017	38.7	30.5	1	18	22	16.60	0.00	16.60	0.00			
799	03/08/2017	37.2	28.5	1	18	22	14.85	0.00	14.85	0.00			
800	04/08/2017	35.2	28.5	1	18	22	13.85	0.00	13.85	0.00			
801	05/08/2017	36.1	28.3	0	18	22	14.20	0.00	0.00	0.00			
802	06/08/2017	32.8	28.1	0	18	22	12.45	0.00	0.00	0.00			
803	07/08/2017	35.3	28.6	1	18	22	13.95	0.00	13.95	0.00			
804	08/08/2017	38.1	28.6	1	18	22	15.35	0.00	15.35	0.00			
805	09/08/2017	38.7	29.4	1	18	22	16.05	0.00	16.05	0.00			
806	10/08/2017	37.3	28.3	1	18	22	14.80	0.00	14.80	0.00			
807	11/08/2017	36.7	27.9	1	18	22	14.30	0.00	14.30	0.00			
808	12/08/2017	36.8	28.6	0	18	22	14.70	0.00	0.00	0.00			
809	13/08/2017	37.3	27.4	0	18	22	14.35	0.00	0.00	0.00			
810	14/08/2017	38.0	28.8	1	18	22	15.40	0.00	15.40	0.00			
811	15/08/2017	37.3	28.2	0	18	22	14.75	0.00	0.00	0.00			
812	16/08/2017	38.3	27.4	1	18	22	14.85	0.00	14.85	0.00			
813	17/08/2017	38.4	28.2	1	18	22	15.30	0.00	15.30	0.00			
814	18/08/2017	34.4	28.0	1	18	22	13.20	0.00	13.20	0.00			
815	19/08/2017	34.7	27.4	0	18	22	13.05	0.00	0.00	0.00			
816	20/08/2017	34.5	27.7	0	18	22	13.10	0.00	0.00	0.00			
817	21/08/2017	33.0	27.1	1	18	22	12.05	0.00	12.05	0.00			

818	22/08/2017	34.6	28.3	1	18	22	13.45	0.00	13.45	0.00			
819	23/08/2017	36.1	27.5	1	18	22	13.80	0.00	13.80	0.00			
820	24/08/2017	37.1	28.2	1	18	22	14.65	0.00	14.65	0.00			
821	25/08/2017	37.9	31.6	1	18	22	16.75	0.00	16.75	0.00			
822	26/08/2017	38.4	31.2	0	18	22	16.80	0.00	0.00	0.00			
823	27/08/2017	38.1	29.7	0	18	22	15.90	0.00	0.00	0.00			
824	28/08/2017	37.1	28.2	1	18	22	14.65	0.00	14.65	0.00			
825	29/08/2017	35.6	27.3	1	18	22	13.45	0.00	13.45	0.00			
826	30/08/2017	35.1	26.4	1	18	22	12.75	0.00	12.75	0.00			
827	31/08/2017	34.3	26.4	1	18	22	12.35	0.00	12.35	0.00			
828	01/09/2017	35.6	28.0	1	18	22	13.80	0.00	13.80	0.00			
829	02/09/2017	36.8	29.3	0	18	22	15.05	0.00	0.00	0.00			
830	03/09/2017	38.7	28.3	0	18	22	15.50	0.00	0.00	0.00			
831	04/09/2017	37.7	30.1	1	18	22	15.90	0.00	15.90	0.00			
832	05/09/2017	37.0	27.6	1	18	22	14.30	0.00	14.30	0.00			
833	06/09/2017	34.0	26.5	1	18	22	12.25	0.00	12.25	0.00			
834	07/09/2017	33.5	27.1	1	18	22	12.30	0.00	12.30	0.00			
835	08/09/2017	34.3	26.2	1	18	22	12.25	0.00	12.25	0.00			
836	09/09/2017	35.7	26.3	0	18	22	13.00	0.00	0.00	0.00			
837	10/09/2017	36.8	26.7	0	18	22	13.75	0.00	0.00	0.00			
838	11/09/2017	37.8	26.0	1	18	22	13.90	0.00	13.90	0.00			
839	12/09/2017	38.9	26.7	1	18	22	14.80	0.00	14.80	0.00			
840	13/09/2017	36.1	27.7	1	18	22	13.90	0.00	13.90	0.00			
841	14/09/2017	36.8	25.4	1	18	22	13.10	0.00	13.10	0.00			
842	15/09/2017	36.3	25.0	1	18	22	12.65	0.00	12.65	0.00			
843	16/09/2017	34.2	26.2	0	18	22	12.20	0.00	0.00	0.00			
844	17/09/2017	32.8	26.5	0	18	22	11.65	0.00	0.00	0.00			
845	18/09/2017	33.4	26.3	1	18	22	11.85	0.00	11.85	0.00			
846	19/09/2017	35.2	25.9	1	18	22	12.55	0.00	12.55	0.00			
847	20/09/2017	33.7	25.6	1	18	22	11.65	0.00	11.65	0.00			

848	21/09/2017	36.2	25.5	1	18	22	12.85	0.00	12.85	0.00			
849	22/09/2017	30.3	25.2	1	18	22	9.75	0.00	9.75	0.00			
850	23/09/2017	30.4	23.4	0	18	22	8.90	0.00	0.00	0.00			
851	24/09/2017	30.9	24.3	0	18	22	9.60	0.00	0.00	0.00			
852	25/09/2017	33.6	25.5	1	18	22	11.55	0.00	11.55	0.00	648.95	0.00	10064.6
853	26/09/2017	30.8	25.8	1	18	22	10.30	0.00	10.30	0.00			
854	27/09/2017	30.3	25.5	1	18	22	9.90	0.00	9.90	0.00			
855	28/09/2017	33.1	25.5	1	18	22	11.30	0.00	11.30	0.00			
856	29/09/2017	31.2	26.3	1	18	22	10.75	0.00	10.75	0.00			
857	30/09/2017	28.0	24.6	0	18	22	8.30	0.00	0.00	0.00			
858	01/10/2017	29.4	24.8	0	18	22	9.10	0.00	0.00	0.00			
859	02/10/2017	31.6	24.9	1	18	22	10.25	0.00	10.25	0.00			
860	03/10/2017	30.5	24.8	1	18	22	9.65	0.00	9.65	0.00			
861	04/10/2017	30.0	25.0	1	18	22	9.50	0.00	9.50	0.00			
862	05/10/2017	29.7	24.5	1	18	22	9.10	0.00	9.10	0.00			
863	06/10/2017	30.9	25.5	1	18	22	10.20	0.00	10.20	0.00			
864	07/10/2017	29.2	25.7	0	18	22	9.45	0.00	0.00	0.00			
865	08/10/2017	30.0	22.2	0	18	22	8.10	0.00	0.00	0.00			
866	09/10/2017	25.8	22.1	1	18	22	5.95	0.00	5.95	0.00			
867	10/10/2017	28.2	23.1	1	18	22	7.65	0.00	7.65	0.00			
868	11/10/2017	27.4	23.0	1	18	22	7.20	0.00	7.20	0.00			
869	12/10/2017	27.0	23.2	1	18	22	7.10	0.00	7.10	0.00			
870	13/10/2017	28.7	23.1	1	18	22	7.90	0.00	7.90	0.00			
871	14/10/2017	30.0	22.7	0	18	22	8.35	0.00	0.00	0.00			
872	15/10/2017	28.7	23.1	0	18	22	7.90	0.00	0.00	0.00			
873	16/10/2017	28.1	23.7	1	18	22	7.90	0.00	7.90	0.00			
874	17/10/2017	28.9	24.6	1	18	22	8.75	0.00	8.75	0.00			
875	18/10/2017	30.8	23.8	1	18	22	9.30	0.00	9.30	0.00			
876	19/10/2017	32.2	24.1	1	18	22	10.15	0.00	10.15	0.00			
877	20/10/2017	33.0	23.3	1	18	22	10.15	0.00	10.15	0.00			

878	21/10/2017	30.5	22.5	0	18	22	8.50	0.00	0.00	0.00			
879	22/10/2017	29.2	21.5	0	18	22	7.35	0.13	0.00	0.00			
880	23/10/2017	28.1	22.3	1	18	22	7.20	0.00	7.20	0.00			
881	24/10/2017	28.5	20.1	1	18	22	6.30	0.48	6.30	0.48			
882	25/10/2017	23.6	17.8	1	18	22	2.75	1.70	2.75	1.70			
883	26/10/2017	26.7	20.1	1	18	22	5.40	0.48	5.40	0.48			
884	27/10/2017	26.3	22.1	1	18	22	6.20	0.00	6.20	0.00			
885	28/10/2017	26.4	18.4	0	18	22	4.40	0.90	0.00	0.00			
886	29/10/2017	26.9	20.3	0	18	22	5.60	0.43	0.00	0.00			
887	30/10/2017	24.9	19.4	1	18	22	4.15	0.65	4.15	0.65			
888	31/10/2017	24.4	20.3	1	18	22	4.35	0.43	4.35	0.43			2934.15
889	01/11/2017	24.0	19.1	1	18	22	3.55	0.95	3.55	0.95			
890	02/11/2017	22.9	19.1	1	18	22	3.00	1.23	3.00	1.23			
891	03/11/2017	23.5	18.3	1	18	22	2.90	1.48	2.90	1.48			
892	04/11/2017	26.3	17.4	0	18	22	4.00	1.23	0.00	0.00			
893	05/11/2017	18.4	14.6	0	18	22	0.10	5.50	0.00	0.00			
894	06/11/2017	24.0	15.8	1	18	22	2.45	2.60	2.45	2.60			
895	07/11/2017	23.8	17.3	1	18	22	2.73	1.90	2.73	1.90			
896	08/11/2017	23.8	18.9	1	18	22	3.35	1.10	3.35	1.10			
897	09/11/2017	25.4	18.1	1	18	22	3.75	1.10	3.75	1.10			
898	10/11/2017	23.0	17.7	1	18	22	2.43	1.90	2.43	1.90			
899	11/11/2017	24.5	17.5	0	18	22	3.13	1.63	0.00	0.00			
900	12/11/2017	23.4	14.7	0	18	22	1.88	3.30	0.00	0.00			
901	13/11/2017	25.3	18.6	1	18	22	3.95	0.87	3.95	0.87			
902	14/11/2017	23.8	18.0	1	18	22	2.90	1.55	2.90	1.55			
903	15/11/2017	26.0	17.7	1	18	22	3.93	1.15	3.93	1.15			
904	16/11/2017	26.3	17.8	1	18	22	4.10	1.05	4.10	1.05			
905	17/11/2017	26.6	16.9	1	18	22	4.03	1.40	4.03	1.40			
906	18/11/2017	25.5	15.5	0	18	22	3.13	2.38	0.00	0.00			
907	19/11/2017	23.0	18.2	0	18	22	2.60	1.65	0.00	0.00			

908	20/11/2017	21.9	13.5	1	18	22	0.98	4.30	0.98	4.30			
909	21/11/2017	16.7	14.8	1	18	22	0.00	6.25	0.00	6.25			
910	22/11/2017	16.1	13.7	1	18	22	0.00	7.10	0.00	7.10			
911	23/11/2017	19.9	10.7	1	18	22	0.48	6.70	0.48	6.70	44.50	42.63	2173.5
912	24/11/2017	21.8	14.4	1	18	22	1.00	3.90	1.00	3.90			
913	25/11/2017	18.1	15.1	0	18	22	0.03	5.40	0.00	0.00			
914	26/11/2017	20.5	15.7	0	18	22	0.68	3.90	0.00	0.00			
915	27/11/2017	21.1	12.8	1	18	22	0.78	5.05	0.78	5.05			
916	28/11/2017	15.0	13.2	1	18	22	0.00	7.90	0.00	7.90			
917	29/11/2017	18.1	13.9	1	18	22	0.03	6.00	0.03	6.00			
918	30/11/2017	20.5	12.4	1	18	22	0.63	5.55	0.63	5.55			
919	01/12/2017	21	13.9	1	18	22	0.75	4.55	0.75	4.55			
920	02/12/2017	21.5	12.2	0	18	22	0.88	5.15	0.00	0.00			
921	03/12/2017	21.9	11.5	0	18	22	0.98	5.30	0.00	0.00			
922	04/12/2017	21.3	11.7	1	18	22	0.83	5.50	0.83	5.50			
923	05/12/2017	22	14.7	1	18	22	1.18	3.65	1.18	3.65			
924	06/12/2017	9	11.1	1	18	22	0.00	11.95	0.00	11.95			
925	07/12/2017	14	9.9	1	18	22	0.00	10.05	0.00	10.05			
926	08/12/2017	18.3	8.7	1	18	22	0.08	8.50	0.08	8.50			
927	09/12/2017	19.5	8.3	0	18	22	0.38	8.10	0.00	0.00			
928	10/12/2017	18.8	8.7	0	18	22	0.20	8.25	0.00	0.00			
929	11/12/2017	20.2	8.8	1	18	22	0.55	7.50	0.55	7.50			
930	12/12/2017	20.9	12.7	1	18	22	0.73	5.20	0.73	5.20			
931	13/12/2017	19.3	13.6	1	18	22	0.33	5.55	0.33	5.55			
932	14/12/2017	20.4	11.2	1	18	22	0.60	6.20	0.60	6.20			
933	15/12/2017	22	12.4	1	18	22	1.00	4.80	1.00	4.80			
934	16/12/2017	22.1	11.1	0	18	22	1.03	5.43	0.00	0.00			
935	17/12/2017	19.7	11.2	0	18	22	0.43	6.55	0.00	0.00			
936	18/12/2017	21.6	11.1	1	18	22	0.90	5.65	0.90	5.65			
937	19/12/2017	18	15.0	1	18	22	0.00	5.50	0.00	5.50			

938	20/12/2017	19.3	11.9	1	18	22	0.33	6.40	0.33	6.40			
939	21/12/2017	21.3	11.0	1	18	22	0.83	5.85	0.83	5.85			
940	22/12/2017	16.8	13.9	1	18	22	0.00	6.65	0.00	6.65			
941	23/12/2017	21.3	17.1	0	18	22	1.43	2.80	0.00	0.00			
942	24/12/2017	16	12.8	0	18	22	0.00	7.60	0.00	0.00			
943	25/12/2017	16.8	10.7	0	18	22	0.00	8.25	0.00	0.00			
944	26/12/2017	19.4	10.3	0	18	22	0.35	7.15	0.00	0.00			
945	27/12/2017	19.2	9.0	1	18	22	0.30	7.90	0.30	7.90			
946	28/12/2017	21.8	11.1	1	18	22	0.95	5.55	0.95	5.55			
947	29/12/2017	18.4	9.5	1	18	22	0.10	8.05	0.10	8.05			
948	30/12/2017	18.4	9.8	0	18	22	0.10	7.90	0.00	0.00			
949	31/12/2017	12.8	11.6	0	18	22	0.00	9.80	0.00	0.00			
950	01/01/2018	16.8	10.4	0	18	22	0.00	8.40	0.00	0.00			
951	02/01/2018	19.1	11.1	0	18	22	0.28	6.90	0.00	0.00			
952	03/01/2018	19.3	10.8	1	18	22	0.33	6.95	0.33	6.95			
953	04/01/2018	14.4	10.2	1	18	22	0.00	9.70	0.00	9.70			
954	05/01/2018	14.3	10.5	1	18	22	0.00	9.60	0.00	9.60			
955	06/01/2018	17.4	10.9	0	18	22	0.00	7.85	0.00	0.00			
956	07/01/2018	20.6	10.5	0	18	22	0.65	6.45	0.00	0.00			
957	08/01/2018	18.7	10.0	1	18	22	0.18	7.65	0.18	7.65			
958	09/01/2018	18.9	12.0	1	18	22	0.23	6.55	0.23	6.55			
959	10/01/2018	18.5	8.1	1	18	22	0.13	8.70	0.13	8.70			
960	11/01/2018	17.7	10.7	1	18	22	0.00	7.80	0.00	7.80			
961	12/01/2018	20.3	10.2	1	18	22	0.58	6.75	0.58	6.75			
962	13/01/2018	18.9	10.5	0	18	22	0.23	7.30	0.00	0.00			
963	14/01/2018	16.7	9.6	0	18	22	0.00	8.85	0.00	0.00			
964	15/01/2018	17.3	10.5	1	18	22	0.00	8.10	0.00	8.10			
965	16/01/2018	18.1	10.7	1	18	22	0.03	7.60	0.03	7.60			
966	17/01/2018	16.3	9.0	1	18	22	0.00	9.35	0.00	9.35			
967	18/01/2018	16.4	14.0	1	18	22	0.00	6.80	0.00	6.80			

968	19/01/2018	14.3	10.6	1	18	22	0.00	9.55	0.00	9.55			
969	20/01/2018	17.5	7.3	0	18	22	0.00	9.60	0.00	0.00			
970	21/01/2018	16.3	7.8	0	18	22	0.00	9.95	0.00	0.00			
971	22/01/2018	19.2	13.2	1	18	22	0.30	5.80	0.30	5.80			
972	23/01/2018	13.7	10.4	1	18	22	0.00	9.95	0.00	9.95			
973	24/01/2018	15.4	9.9	1	18	22	0.00	9.35	0.00	9.35	13.60	283.60	6890
974	25/01/2018	11.6	9.2	1	18	22	0.00	11.60	0.00	11.60			
975	26/01/2018	12.6	8.6	1	18	22	0.00	11.40	0.00	11.40			
976	27/01/2018	14.8	7.7	0	18	22	0.00	10.75	0.00	0.00			
977	28/01/2018	16.7	7.4	0	18	22	0.00	9.95	0.00	0.00			
978	29/01/2018	16.3	7.0	1	18	22	0.00	10.35	0.00	10.35			
979	30/01/2018	19.6	9.4	1	18	22	0.40	7.50	0.40	7.50			
980	31/01/2018	19.1	9.1	1	18	22	0.28	7.90	0.28	7.90			
981	01/02/2018	19.1	8.8	1	18	22	0.28	8.05	0.28	8.05			
982	02/02/2018	19.9	8.5	1	18	22	0.48	7.80	0.48	7.80			
983	03/02/2018	18.7	10.6	0	18	22	0.18	7.35	0.00	0.00			
984	04/02/2018	16.9	10.9	0	18	22	0.00	8.10	0.00	0.00			
985	05/02/2018	18.9	10.8	1	18	22	0.23	7.15	0.23	7.15			
986	06/02/2018	20.5	13.1	1	18	22	0.63	5.20	0.63	5.20			
987	07/02/2018	21.8	10.9	1	18	22	0.95	5.65	0.95	5.65			
988	08/02/2018	19.2	12.2	1	18	22	0.30	6.30	0.30	6.30			
989	09/02/2018	24.2	11.9	1	18	22	1.58	4.50	1.58	4.50			
990	10/02/2018	19.0	11.6	0	18	22	0.25	6.70	0.00	0.00			
991	11/02/2018	18.5	15.2	0	18	22	0.13	5.15	0.00	0.00			
992	12/02/2018	16.5	10.2	1	18	22	0.00	8.65	0.00	8.65			
993	13/02/2018	18.1	11.7	1	18	22	0.03	7.10	0.03	7.10			
994	14/02/2018	19.1	9.9	1	18	22	0.28	7.50	0.28	7.50			
995	15/02/2018	18.3	10.2	1	18	22	0.08	7.75	0.08	7.75			
996	16/02/2018	17.6	14.6	1	18	22	0.00	5.90	0.00	5.90			
997	17/02/2018	12.2	13.6	0	18	22	0.00	9.10	0.00	0.00			

998	18/02/2018	19.6	12.8	0	18	22	0.40	5.80	0.00	0.00			
999	19/02/2018	18.8	12.7	0	18	22	0.20	6.25	0.00	0.00			
1000	20/02/2018	20.2	12.2	1	18	22	0.55	5.80	0.55	5.80			
1001	21/02/2018	21.2	12.7	1	18	22	0.80	5.05	0.80	5.05			
1002	22/02/2018	17.9	12.2	1	18	22	0.00	6.95	0.00	6.95			
1003	23/02/2018	17.4	12.0	1	18	22	0.00	7.30	0.00	7.30			
1004	24/02/2018	18.5	12.9	0	18	22	0.13	6.30	0.00	0.00			
1005	25/02/2018	17.9	12.4	0	18	22	0.00	6.85	0.00	0.00			
1006	26/02/2018	14.5	12.3	1	18	22	0.00	8.60	0.00	8.60			
1007	27/02/2018	18.9	14.1	1	18	22	0.23	5.50	0.23	5.50			
1008	28/02/2018	20.8	10.7	1	18	22	0.70	6.25	0.70	6.25			
1009	01/03/2018	22.0	14.7	1	18	22	1.18	3.65	1.18	3.65			
1010	02/03/2018	21.5	14.3	1	18	22	0.88	4.10	0.88	4.10			
1011	03/03/2018	22.2	12.9	0	18	22	1.05	4.50	0.00	0.00			
1012	04/03/2018	24.1	13.3	0	18	22	1.88	3.83	0.00	0.00			
1013	05/03/2018	25.5	16.0	1	18	22	3.25	2.13	3.25	2.13			
1014	06/03/2018	25.2	15.7	1	18	22	3.03	2.35	3.03	2.35			
1015	07/03/2018	25.5	16.4	1	18	22	3.35	1.93	3.35	1.93			
1016	08/03/2018	25.1	13.9	1	18	22	2.53	3.28	2.53	3.28			
1017	09/03/2018	20.2	16.8	1	18	22	0.80	3.50	0.80	3.50			
1018	10/03/2018	20.7	15.1	0	18	22	0.68	4.10	0.00	0.00			
1019	11/03/2018	22.9	15.5	0	18	22	1.83	3.03	0.00	0.00			
1020	12/03/2018	23.6	16.0	1	18	22	2.30	2.60	2.30	2.60			
1021	13/03/2018	23.1	14.2	1	18	22	1.60	3.63	1.60	3.63			
1022	14/03/2018	24.1	15.9	1	18	22	2.53	2.53	2.53	2.53			
1023	15/03/2018	21.3	17.5	1	18	22	1.53	2.60	1.53	2.60			
1024	16/03/2018	20.6	16.3	1	18	22	0.88	3.55	0.88	3.55			
1025	17/03/2018	24.4	17.4	0	18	22	3.05	1.70	0.00	0.00			
1026	18/03/2018	23.1	14.2	0	18	22	1.60	3.63	0.00	0.00			
1027	19/03/2018	28.0	19.2	1	18	22	5.60	0.70	5.60	0.70			

1028	20/03/2018	25.0	16.5	1	18	22	3.13	2.00	3.13	2.00			
1029	21/03/2018	26.1	19.2	1	18	22	4.65	0.70	4.65	0.70			
1030	22/03/2018	24.3	16.9	1	18	22	2.88	1.98	2.88	1.98	71.05	227.00	5499.95
1031	23/03/2018	31.1	19.5	1	18	22	7.30	0.63	7.30	0.63			
1032	24/03/2018	20.7	16.2	0	18	22	0.90	3.55	0.00	0.00			
1033	25/03/2018	19.6	17.8	0	18	22	0.75	3.30	0.00	0.00			
1034	26/03/2018	24.7	18.0	1	18	22	3.35	1.33	3.35	1.33			
1035	27/03/2018	29.5	20.9	1	18	22	7.20	0.28	7.20	0.28			
1036	28/03/2018	24.2	20.5	1	18	22	4.35	0.38	4.35	0.38			
1037	29/03/2018	18.0	17.8	1	18	22	0.00	4.10	0.00	4.10			
1038	30/03/2018	20.8	16.5	1	18	22	1.03	3.35	1.03	3.35			
1039	31/03/2018	25.7	17.9	0	18	22	3.83	1.13	0.00	0.00			
1040	01/04/2018	26.6	18.5	0	18	22	4.55	0.88	0.00	0.00			
1041	02/04/2018	24.8	18.6	1	18	22	3.70	1.00	3.70	1.00			
1042	03/04/2018	23.5	20.1	1	18	22	3.80	0.57	3.80	0.57			
1043	04/04/2018	24.9	20.1	1	18	22	4.50	0.48	4.50	0.48			
1044	05/04/2018	29.3	22.3	1	18	22	7.80	0.00	7.80	0.00			
1045	06/04/2018	30.7	23.7	0	18	22	9.20	0.00	0.00	0.00			
1046	07/04/2018	32.2	21.3	0	18	22	8.75	0.18	0.00	0.00			
1047	08/04/2018	23.6	18.1	0	18	22	2.85	1.55	0.00	0.00			
1048	09/04/2018	17.4	17.9	0	18	22	0.00	4.35	0.00	0.00			
1049	10/04/2018	16.9	13.1	1	18	22	0.00	7.00	0.00	7.00			
1050	11/04/2018	24.9	17.9	1	18	22	3.43	1.33	3.43	1.33			
1051	12/04/2018	26.3	17.9	1	18	22	4.13	1.03	4.13	1.03			
1052	13/04/2018	28.3	19.4	1	18	22	5.85	0.65	5.85	0.65			
1053	14/04/2018	31.6	22.2	0	18	22	8.90	0.00	0.00	0.00			
1054	15/04/2018	31.5	25.0	0	18	22	10.25	0.00	0.00	0.00			
1055	16/04/2018	29.1	25.0	1	18	22	9.05	0.00	9.05	0.00			
1056	17/04/2018	31.2	23.0	1	18	22	9.10	0.00	9.10	0.00			
1057	18/04/2018	34.0	24.7	1	18	22	11.35	0.00	11.35	0.00			

1058	19/04/2018	27.7	24.3	1	18	22	8.00	0.00	8.00	0.00			
1059	20/04/2018	25.3	22.0	1	18	22	5.65	0.00	5.65	0.00			
1060	21/04/2018	23.1	18.3	0	18	22	2.70	1.58	0.00	0.00			
1061	22/04/2018	23.9	19.1	0	18	22	3.50	0.98	0.00	0.00			
1062	23/04/2018	30.1	22.4	1	18	22	8.25	0.00	8.25	0.00			
1063	24/04/2018	29.4	20.9	1	18	22	7.15	0.28	7.15	0.28			
1064	25/04/2018	30.6	27.7	1	18	22	11.15	0.00	11.15	0.00			
1065	26/04/2018	30.7	26.4	1	18	22	10.55	0.00	10.55	0.00			
1066	27/04/2018	30.2	27.0	1	18	22	10.60	0.00	10.60	0.00			
1067	28/04/2018	30.0	22.3	0	18	22	8.15	0.00	0.00	0.00			
1068	29/04/2018	32.3	22.6	0	18	22	9.45	0.00	0.00	0.00			
1069	30/04/2018	30.6	22.2	1	18	22	8.40	0.00	8.40	0.00			3316.5
1070	01/05/2018	32.8	27.2	0	18	22	12.00	0.00	0.00	0.00			
1071	02/05/2018	32.1	27.0	1	18	22	11.55	0.00	11.55	0.00			
1072	03/05/2018	34.6	28.6	1	18	22	13.60	0.00	13.60	0.00			
1073	04/05/2018	33.7	28.4	1	18	22	13.05	0.00	13.05	0.00			
1074	05/05/2018	34.0	29.4	0	18	22	13.70	0.00	0.00	0.00			
1075	06/05/2018	29.5	24.1	0	18	22	8.80	0.00	0.00	0.00			
1076	07/05/2018	22.4	23.0	1	18	22	4.70	0.00	4.70	0.00			
1077	08/05/2018	25.5	18.7	1	18	22	4.10	0.83	4.10	0.83			
1078	09/05/2018	27.5	22.6	1	18	22	7.05	0.00	7.05	0.00			
1079	10/05/2018	30.3	22.4	1	18	22	8.35	0.00	8.35	0.00			
1080	11/05/2018	24.1	23.2	1	18	22	5.65	0.00	5.65	0.00			
1081	12/05/2018	26.3	24.0	0	18	22	7.15	0.00	0.00	0.00			
1082	13/05/2018	28.4	24.8	0	18	22	8.60	0.00	0.00	0.00			
1083	14/05/2018	29.7	25.6	1	18	22	9.65	0.00	9.65	0.00			
1084	15/05/2018	32.0	26.4	1	18	22	11.20	0.00	11.20	0.00			
1085	16/05/2018	33.3	27.2	1	18	22	12.25	0.00	12.25	0.00			
1086	17/05/2018	35.9	29.2	1	18	22	14.55	0.00	14.55	0.00			
1087	18/05/2018	37.7	31.2	1	18	22	16.45	0.00	16.45	0.00			

1088	19/05/2018	38.6	32.9	0	18	22	17.75	0.00	0.00	0.00			
1089	20/05/2018	37.1	32.2	0	18	22	16.65	0.00	0.00	0.00			
1090	21/05/2018	38.7	30.7	1	18	22	16.70	0.00	16.70	0.00			
1091	22/05/2018	36.4	27.5	1	18	22	13.95	0.00	13.95	0.00			
1092	23/05/2018	35.3	28.1	1	18	22	13.70	0.00	13.70	0.00	176.50	0.83	2542.65
1093	24/05/2018	37.8	30.1	1	18	22	15.95	0.00	15.95	0.00			
1094	25/05/2018	29.8	26.8	1	18	22	10.30	0.00	10.30	0.00			
1095	26/05/2018	28.6	25.6	0	18	22	9.10	0.00	0.00	0.00			
1096	27/05/2018	30.7	26.0	0	18	22	10.35	0.00	0.00	0.00			
1097	28/05/2018	33.9	25.2	0	18	22	11.55	0.00	0.00	0.00			
1098	29/05/2018	28.8	25.8	1	18	22	9.30	0.00	9.30	0.00			
1099	30/05/2018	18.4	26.5	1	18	22	4.45	0.00	4.45	0.00			
1100	31/05/2018	23.7	25.2	1	18	22	6.45	0.00	6.45	0.00			
1101	01/06/2018	19.3	24.0	1	18	22	3.65	0.00	3.65	0.00			
1102	02/06/2018	24.7	25.3	0	18	22	7.00	0.00	0.00	0.00			
1103	03/06/2018	31.6	27.2	0	18	22	11.40	0.00	0.00	0.00			
1104	04/06/2018	28.5	26.2	1	18	22	9.35	0.00	9.35	0.00			
1105	05/06/2018	34.5	27.0	1	18	22	12.75	0.00	12.75	0.00			
1106	06/06/2018	35.2	28.2	1	18	22	13.70	0.00	13.70	0.00			
1107	07/06/2018	37.5	30.0	1	18	22	15.75	0.00	15.75	0.00			
1108	08/06/2018	39.7	33.2	1	18	22	18.45	0.00	18.45	0.00			
1109	09/06/2018	40.0	33.0	0	18	22	18.50	0.00	0.00	0.00			
1110	10/06/2018	34.4	31.6	0	18	22	15.00	0.00	0.00	0.00			
1111	11/06/2018	31.3	27.0	1	18	22	11.15	0.00	11.15	0.00			
1112	12/06/2018	26.8	28.4	1	18	22	9.60	0.00	9.60	0.00			
1113	13/06/2018	34.4	28.2	1	18	22	13.30	0.00	13.30	0.00			
1114	14/06/2018	29.0	25.8	1	18	22	9.40	0.00	9.40	0.00			
1115	15/06/2018	34.3	27.6	1	18	22	12.95	0.00	12.95	0.00			
1116	16/06/2018	36.1	27.5	0	18	22	13.80	0.00	0.00	0.00			
1117	17/06/2018	31.2	27.1	0	18	22	11.15	0.00	0.00	0.00			

1118	18/06/2018	30.9	26.8	1	18	22	10.85	0.00	10.85	0.00			
1119	19/06/2018	28.9	26.8	1	18	22	9.85	0.00	9.85	0.00			
1120	20/06/2018	32.1	26.5	1	18	22	11.30	0.00	11.30	0.00			
1121	21/06/2018	32.2	26.8	1	18	22	11.50	0.00	11.50	0.00			
1122	22/06/2018	31.8	27.5	1	18	22	11.65	0.00	11.65	0.00			
1123	23/06/2018	32.2	28.2	0	18	22	12.20	0.00	0.00	0.00			
1124	24/06/2018	34.2	27.6	0	18	22	12.90	0.00	0.00	0.00			
1125	25/06/2018	34.9	28.2	1	18	22	13.55	0.00	13.55	0.00			
1126	26/06/2018	34.2	28.7	1	18	22	13.45	0.00	13.45	0.00			
1127	27/06/2018	37.5	27.7	1	18	22	14.60	0.00	14.60	0.00			
1128	28/06/2018	31.8	27.8	1	18	22	11.80	0.00	11.80	0.00			
1129	29/06/2018	31.1	25.5	1	18	22	10.30	0.00	10.30	0.00			
1130	30/06/2018	30.7	26.8	0	18	22	10.75	0.00	0.00	0.00			
1131	01/07/2018	33.0	27.0	0	18	22	12.00	0.00	0.00	0.00			
1132	02/07/2018	34.4	27.6	1	18	22	13.00	0.00	13.00	0.00			
1133	03/07/2018	37.8	29.7	1	18	22	15.75	0.00	15.75	0.00			
1134	04/07/2018	39.9	30.2	1	18	22	17.05	0.00	17.05	0.00			
1135	05/07/2018	39.2	34.3	1	18	22	18.75	0.00	18.75	0.00			
1136	06/07/2018	38.8	34.8	1	18	22	18.80	0.00	18.80	0.00			
1137	07/07/2018	39.3	34.4	0	18	22	18.85	0.00	0.00	0.00			
1138	08/07/2018	38.0	30.2	0	18	22	16.10	0.00	0.00	0.00			
1139	09/07/2018	37.3	28.6	1	18	22	14.95	0.00	14.95	0.00			
1140	10/07/2018	35.3	28.9	1	18	22	14.10	0.00	14.10	0.00			
1141	11/07/2018	35.0	29.8	1	18	22	14.40	0.00	14.40	0.00			
1142	12/07/2018	36.8	29.0	1	18	22	14.90	0.00	14.90	0.00			
1143	13/07/2018	39.3	29.5	1	18	22	16.40	0.00	16.40	0.00			
1144	14/07/2018	40.4	32.9	0	18	22	18.65	0.00	0.00	0.00			
1145	15/07/2018	39.0	33.6	0	18	22	18.30	0.00	0.00	0.00			
1146	16/07/2018	35.3	33.9	1	18	22	16.60	0.00	16.60	0.00			
1147	17/07/2018	39.4	34.1	1	18	22	18.75	0.00	18.75	0.00			

1148	18/07/2018	40.6	32.8	1	18	22	18.70	0.00	18.70	0.00			
1149	19/07/2018	36.3	29.1	1	18	22	14.70	0.00	14.70	0.00			
1150	20/07/2018	36.6	29.6	1	18	22	15.10	0.00	15.10	0.00			
1151	21/07/2018	37.6	29.5	0	18	22	15.55	0.00	0.00	0.00			
1152	22/07/2018	40.6	32.0	0	18	22	18.30	0.00	0.00	0.00			
1153	23/07/2018	40.2	34.9	1	18	22	19.55	0.00	19.55	0.00	556.85	0.00	7163
1154	24/07/2018	39.3	31.2	1	18	22	17.25	0.00	17.25	0.00			
1155	25/07/2018	34.0	29.8	1	18	22	13.90	0.00	13.90	0.00			
1156	26/07/2018	32.3	29.1	1	18	22	12.70	0.00	12.70	0.00			
1157	27/07/2018	32.7	28.3	1	18	22	12.50	0.00	12.50	0.00			
1158	28/07/2018	35.0	28.4	0	18	22	13.70	0.00	0.00	0.00			
1159	29/07/2018	37.3	30.2	0	18	22	15.75	0.00	0.00	0.00			
1160	30/07/2018	36.4	29.4	1	18	22	14.90	0.00	14.90	0.00			
1161	31/07/2018	33.9	29.4	1	18	22	13.65	0.00	13.65	0.00			
1162	01/08/2018	34.9	29.1	1	18	22	14.00	0.00	14.00	0.00			
1163	02/08/2018	39.3	30.2	1	18	22	16.75	0.00	16.75	0.00			
1164	03/08/2018	40.6	31.8	1	18	22	18.20	0.00	18.20	0.00			
1165	04/08/2018	36.6	30.2	0	18	22	15.40	0.00	0.00	0.00			
1166	05/08/2018	37.4	30.6	0	18	22	16.00	0.00	0.00	0.00			
1167	06/08/2018	36.7	29.3	1	18	22	15.00	0.00	15.00	0.00			
1168	07/08/2018	36.5	29.2	1	18	22	14.85	0.00	14.85	0.00			
1169	08/08/2018	38.4	31.3	1	18	22	16.85	0.00	16.85	0.00			
1170	09/08/2018	38.5	33.5	1	18	22	18.00	0.00	18.00	0.00			
1171	10/08/2018	38.9	34.0	1	18	22	18.45	0.00	18.45	0.00			
1172	11/08/2018	39.5	32.9	0	18	22	18.20	0.00	0.00	0.00			
1173	12/08/2018	38.4	32.1	0	18	22	17.25	0.00	0.00	0.00			
1174	13/08/2018	38.7	30.5	1	18	22	16.60	0.00	16.60	0.00			
1175	14/08/2018	39.4	30.9	1	18	22	17.15	0.00	17.15	0.00			
1176	15/08/2018	39.6	31.8	0	18	22	17.70	0.00	0.00	0.00			
1177	16/08/2018	38.5	28.8	1	18	22	15.65	0.00	15.65	0.00			

1178	17/08/2018	37.5	28.2	1	18	22	14.85	0.00	14.85	0.00			
1179	18/08/2018	35.3	29.5	0	18	22	14.40	0.00	0.00	0.00			
1180	19/08/2018	37.3	28.3	0	18	22	14.80	0.00	0.00	0.00			
1181	20/08/2018	37.5	29.6	1	18	22	15.55	0.00	15.55	0.00			
1182	21/08/2018	37.9	29.0	1	18	22	15.45	0.00	15.45	0.00			
1183	22/08/2018	37.9	29.8	1	18	22	15.85	0.00	15.85	0.00			
1184	23/08/2018	39.1	30.5	1	18	22	16.80	0.00	16.80	0.00			
1185	24/08/2018	38.7	29.0	1	18	22	15.85	0.00	15.85	0.00			
1186	25/08/2018	34.9	28.0	0	18	22	13.45	0.00	0.00	0.00			
1187	26/08/2018	34.9	28.1	0	18	22	13.50	0.00	0.00	0.00			
1188	27/08/2018	35.6	28.9	1	18	22	14.25	0.00	14.25	0.00			
1189	28/08/2018	36.0	28.8	1	18	22	14.40	0.00	14.40	0.00			
1190	29/08/2018	33.9	28.6	1	18	22	13.25	0.00	13.25	0.00			
1191	30/08/2018	36.3	28.4	1	18	22	14.35	0.00	14.35	0.00			
1192	31/08/2018	37.8	28.8	1	18	22	15.30	0.00	15.30	0.00			
1193	01/09/2018	39.2	29.9	0	18	22	16.55	0.00	0.00	0.00			
1194	02/09/2018	39.3	29.6	0	18	22	16.45	0.00	0.00	0.00			
1195	03/09/2018	40.2	32.2	1	18	22	18.20	0.00	18.20	0.00			
1196	04/09/2018	39.3	31.9	1	18	22	17.60	0.00	17.60	0.00			
1197	05/09/2018	36.6	28.7	1	18	22	14.65	0.00	14.65	0.00			
1198	06/09/2018	33.1	28.2	1	18	22	12.65	0.00	12.65	0.00			
1199	07/09/2018	34.1	28.6	1	18	22	13.35	0.00	13.35	0.00			
1200	08/09/2018	33.2	25.7	0	18	22	11.45	0.00	0.00	0.00			
1201	09/09/2018	30.3	27.7	0	18	22	11.00	0.00	0.00	0.00			
1202	10/09/2018	32.9	27.4	1	18	22	12.15	0.00	12.15	0.00			
1203	11/09/2018	33.5	28.1	1	18	22	12.80	0.00	12.80	0.00			
1204	12/09/2018	32.9	27.9	1	18	22	12.40	0.00	12.40	0.00			
1205	13/09/2018	32.9	27.6	1	18	22	12.25	0.00	12.25	0.00			
1206	14/09/2018	30.7	27.4	1	18	22	11.05	0.00	11.05	0.00			
1207	15/09/2018	31.7	26.2	0	18	22	10.95	0.00	0.00	0.00			

1208	16/09/2018	33.8	27.4	0	18	22	12.60	0.00	0.00	0.00			
1209	17/09/2018	34.4	28.8	1	18	22	13.60	0.00	13.60	0.00			
1210	18/09/2018	35.4	30.0	1	18	22	14.70	0.00	14.70	0.00			
1211	19/09/2018	37.4	29.1	1	18	22	15.25	0.00	15.25	0.00			
1212	20/09/2018	36.9	29.6	1	18	22	15.25	0.00	15.25	0.00			
1213	21/09/2018	34.5	27.6	1	18	22	13.05	0.00	13.05	0.00			
1214	22/09/2018	35.8	27.4	0	18	22	13.60	0.00	0.00	0.00			
1215	23/09/2018	37.2	27.8	0	18	22	14.50	0.00	0.00	0.00			
1216	24/09/2018	36.5	27.3	1	18	22	13.90	0.00	13.90	0.00	704.55	0.00	9749
1217	25/09/2018	34.5	27.5	1	18	22	13.00	0.00	13.00	0.00			
1218	26/09/2018	33.9	25.3	1	18	22	11.60	0.00	11.60	0.00			
1219	27/09/2018	33.6	27.9	1	18	22	12.75	0.00	12.75	0.00			
1220	28/09/2018	33.8	26.3	1	18	22	12.05	0.00	12.05	0.00			
1221	29/09/2018	33.1	28.0	0	18	22	12.55	0.00	0.00	0.00			
1222	30/09/2018	35.0	28.8	0	18	22	13.90	0.00	0.00	0.00			
1223	01/10/2018	31.1	25.3	0	18	22	10.20	0.00	0.00	0.00			
1224	02/10/2018	30.0	25.1	1	18	22	9.55	0.00	9.55	0.00			
1225	03/10/2018	31.9	24.5	1	18	22	10.20	0.00	10.20	0.00			
1226	04/10/2018	32.8	24.2	1	18	22	10.50	0.00	10.50	0.00			
1227	05/10/2018	31.7	27.5	1	18	22	11.60	0.00	11.60	0.00			
1228	06/10/2018	33.1	26.7	0	18	22	11.90	0.00	0.00	0.00			
1229	07/10/2018	32.7	26.1	0	18	22	11.40	0.00	0.00	0.00			
1230	08/10/2018	31.8	26.0	1	18	22	10.90	0.00	10.90	0.00			
1231	09/10/2018	26.3	22.3	1	18	22	6.30	0.00	6.30	0.00			
1232	10/10/2018	28.2	24.7	1	18	22	8.45	0.00	8.45	0.00			
1233	11/10/2018	30.9	23.8	1	18	22	9.35	0.00	9.35	0.00			
1234	12/10/2018	29.2	24.1	1	18	22	8.65	0.00	8.65	0.00			
1235	13/10/2018	25.7	23.2	0	18	22	6.45	0.00	0.00	0.00			
1236	14/10/2018	30.0	23.1	0	18	22	8.55	0.00	0.00	0.00			
1237	15/10/2018	29.6	23.5	1	18	22	8.55	0.00	8.55	0.00			

1238	16/10/2018	30.0	23.8	1	18	22	8.90	0.00	8.90	0.00			
1239	17/10/2018	28.8	23.3	1	18	22	8.05	0.00	8.05	0.00			
1240	18/10/2018	31.4	23.7	1	18	22	9.55	0.00	9.55	0.00			
1241	19/10/2018	32.1	24.2	1	18	22	10.15	0.00	10.15	0.00			
1242	20/10/2018	24.4	23.9	0	18	22	6.15	0.00	0.00	0.00			
1243	21/10/2018	27.1	22.0	0	18	22	6.55	0.00	0.00	0.00			
1244	22/10/2018	27.4	22.6	1	18	22	7.00	0.00	7.00	0.00			
1245	23/10/2018	28.6	23.3	1	18	22	7.95	0.00	7.95	0.00			
1246	24/10/2018	28.9	23.1	1	18	22	8.00	0.00	8.00	0.00			
1247	25/10/2018	23.8	21.1	1	18	22	4.45	0.23	4.45	0.23			
1248	26/10/2018	20.5	17.2	1	18	22	1.05	3.15	1.05	3.15			
1249	27/10/2018	23.3	18.6	0	18	22	2.95	1.38	0.00	0.00			
1250	28/10/2018	26.0	18.3	0	18	22	4.15	0.93	0.00	0.00			
1251	29/10/2018	27.2	18.8	1	18	22	5.00	0.80	5.00	0.80			
1252	30/10/2018	28.6	19.3	1	18	22	5.95	0.68	5.95	0.68			
1253	31/10/2018	30.2	20.4	1	18	22	7.30	0.40	7.30	0.40			2929.5
1254	01/11/2018	30.2	19.9	1	18	22	7.05	0.53	7.05	0.53			
1255	02/11/2018	30.5	21.8	1	18	22	8.15	0.05	8.15	0.05			
1256	03/11/2018	26.9	22.0	0	18	22	6.45	0.00	0.00	0.00			
1257	04/11/2018	22.8	21.8	0	18	22	4.30	0.05	0.00	0.00			
1258	05/11/2018	23.0	20.1	1	18	22	3.55	0.70	3.55	0.70			
1259	06/11/2018	25.9	19.6	1	18	22	4.75	0.60	4.75	0.60			
1260	07/11/2018	26.4	19.3	1	18	22	4.85	0.68	4.85	0.68			
1261	08/11/2018	21.3	17.9	1	18	22	1.63	2.40	1.63	2.40			
1262	09/11/2018	23.0	14.9	1	18	22	1.73	3.30	1.73	3.30			
1263	10/11/2018	22.2	17.6	0	18	22	2.00	2.15	0.00	0.00			
1264	11/11/2018	22.9	16.3	0	18	22	2.03	2.63	0.00	0.00			
1265	12/11/2018	23.2	17.6	1	18	22	2.50	1.90	2.50	1.90			
1266	13/11/2018	19.6	17.0	1	18	22	0.55	3.70	0.55	3.70			
1267	14/11/2018	22.1	19.0	1	18	22	2.55	1.48	2.55	1.48			

1268	15/11/2018	19.3	13.7	1	18	22	0.33	5.50	0.33	5.50			
1269	16/11/2018	19.4	15.1	1	18	22	0.35	4.75	0.35	4.75			
1270	17/11/2018	20.7	12.6	0	18	22	0.68	5.35	0.00	0.00			
1271	18/11/2018	22.9	15.1	0	18	22	1.73	3.23	0.00	0.00			
1272	19/11/2018	24.4	14.3	1	18	22	2.28	3.25	2.28	3.25			
1273	20/11/2018	24.6	14.9	1	18	22	2.53	2.90	2.53	2.90			
1274	21/11/2018	22.2	15.6	1	18	22	1.50	3.15	1.50	3.15			
1275	22/11/2018	22.9	17.1	1	18	22	2.23	2.23	2.23	2.23	46.50	37.10	2079
1276	23/11/2018	19.9	11.5	1	18	22	0.48	6.30	0.48	6.30			
1277	24/11/2018	17.6	15.5	0	18	22	0.00	5.45	0.00	0.00			
1278	25/11/2018	21.5	14.4	0	18	22	0.88	4.05	0.00	0.00			
1279	26/11/2018	22.1	13.8	1	18	22	1.03	4.08	1.03	4.08			
1280	27/11/2018	22.8	15.1	1	18	22	1.68	3.25	1.68	3.25			
1281	28/11/2018	22.8	14.1	1	18	22	1.43	3.75	1.43	3.75			
1282	29/11/2018	20.6	16.9	1	18	22	1.03	3.25	1.03	3.25			
1283	30/11/2018	17.2	14.7	1	18	22	0.00	6.05	0.00	6.05			
1284	01/12/2018	21.3	13.2	0	18	22	0.83	4.75	0.00	0.00			
1285	02/12/2018	19.5	12.9	0	18	22	0.38	5.80	0.00	0.00			
1286	03/12/2018	19.6	15.5	1	18	22	0.40	4.45	0.40	4.45			
1287	04/12/2018	17.6	12.6	1	18	22	0.00	6.90	0.00	6.90			
1288	05/12/2018	19.6	13.1	1	18	22	0.40	5.65	0.40	5.65			
1289	06/12/2018	17.7	13.2	1	18	22	0.00	6.55	0.00	6.55			
1290	07/12/2018	15.4	11.8	1	18	22	0.00	8.40	0.00	8.40			
1291	08/12/2018	18.7	10.9	0	18	22	0.18	7.20	0.00	0.00			
1292	09/12/2018	20.2	11.9	0	18	22	0.55	5.95	0.00	0.00			
1293	10/12/2018	21.1	13.5	1	18	22	0.78	4.70	0.78	4.70			
1294	11/12/2018	19.4	12.4	1	18	22	0.35	6.10	0.35	6.10			
1295	12/12/2018	17.2	15.7	1	18	22	0.00	5.55	0.00	5.55			
1296	13/12/2018	15.9	11.1	1	18	22	0.00	8.50	0.00	8.50			
1297	14/12/2018	18.7	9.2	1	18	22	0.18	8.05	0.18	8.05			

1298	15/12/2018	19.7	13.1	0	18	22	0.43	5.60	0.00	0.00			
1299	16/12/2018	17.9	13.7	0	18	22	0.00	6.20	0.00	0.00			
1300	17/12/2018	17.9	12.7	1	18	22	0.00	6.70	0.00	6.70			
1301	18/12/2018	19.0	13.9	1	18	22	0.25	5.55	0.25	5.55			
1302	19/12/2018	13.5	10.9	1	18	22	0.00	9.80	0.00	9.80			
1303	20/12/2018	18.2	12.3	1	18	22	0.05	6.75	0.05	6.75			
1304	21/12/2018	19.1	11.5	1	18	22	0.28	6.70	0.28	6.70			
1305	22/12/2018	18.0	10.1	0	18	22	0.00	7.95	0.00	0.00			
1306	23/12/2018	18.8	9.9	0	18	22	0.20	7.65	0.00	0.00			
1307	24/12/2018	20.5	13.4	0	18	22	0.63	5.05	0.00	0.00			
1308	25/12/2018	20.0	9.9	0	18	22	0.50	7.05	0.00	0.00			
1309	26/12/2018	16.1	14.1	0	18	22	0.00	6.90	0.00	0.00			
1310	27/12/2018	12.4	8.1	1	18	22	0.00	11.75	0.00	11.75			
1311	28/12/2018	13.9	6.8	1	18	22	0.00	11.65	0.00	11.65			
1312	29/12/2018	12.4	5.6	0	18	22	0.00	13.00	0.00	0.00			
1313	30/12/2018	12.1	10.4	0	18	22	0.00	10.75	0.00	0.00			
1314	31/12/2018	17.0	5.6	1	18	22	0.00	10.70	0.00	10.70			
1315	01/01/2019	16.5	10.1	0	18	22	0.00	8.70	0.00	0.00			
1316	02/01/2019	13.0	9.6	0	18	22	0.00	10.70	0.00	0.00			
1317	03/01/2019	18.0	7.4	1	18	22	0.00	9.30	0.00	9.30			
1318	04/01/2019	15.5	13.8	1	18	22	0.00	7.35	0.00	7.35			
1319	05/01/2019	16.5	10.8	0	18	22	0.00	8.35	0.00	0.00			
1320	06/01/2019	11.5	8.8	0	18	22	0.00	11.85	0.00	0.00			
1321	07/01/2019	12.4	7.3	1	18	22	0.00	12.15	0.00	12.15			
1322	08/01/2019	11.7	6.6	1	18	22	0.00	12.85	0.00	12.85			
1323	09/01/2019	11.8	7.1	1	18	22	0.00	12.55	0.00	12.55			
1324	10/01/2019	15.2	3.8	1	18	22	0.00	12.50	0.00	12.50			
1325	11/01/2019	15.3	5.2	1	18	22	0.00	11.75	0.00	11.75			
1326	12/01/2019	14.2	6.9	0	18	22	0.00	11.45	0.00	0.00			
1327	13/01/2019	13.5	8.8	0	18	22	0.00	10.85	0.00	0.00			

1328	14/01/2019	15.0	6.9	1	18	22	0.00	11.05	0.00	11.05			
1329	15/01/2019	16.2	12.2	1	18	22	0.00	7.80	0.00	7.80			
1330	16/01/2019	10.9	9.3	1	18	22	0.00	11.90	0.00	11.90			
1331	17/01/2019	13.4	6.8	1	18	22	0.00	11.90	0.00	11.90			
1332	18/01/2019	15.1	6.1	1	18	22	0.00	11.40	0.00	11.40			
1333	19/01/2019	16.9	8.0	0	18	22	0.00	9.55	0.00	0.00			
1334	20/01/2019	13.8	9.9	0	18	22	0.00	10.15	0.00	0.00			
1335	21/01/2019	16.2	10.0	1	18	22	0.00	8.90	0.00	8.90			
1336	22/01/2019	17.4	8.1	1	18	22	0.00	9.25	0.00	9.25			
1337	23/01/2019	17.5	7.1	1	18	22	0.00	9.70	0.00	9.70	8.30	321.48	7116
1338	24/01/2019	16.1	9.7	1	18	22	0.00	9.10	0.00	9.10			
1339	25/01/2019	19.6	7	1	18	22	0.40	8.70	0.40	8.70			
1340	26/01/2019	19.6	8.5	0	18	22	0.40	7.95	0.00	0.00			
1341	27/01/2019	16.2	10	0	18	22	0.00	8.90	0.00	0.00			
1342	28/01/2019	14.8	9.7	1	18	22	0.00	9.75	0.00	9.75			
1343	29/01/2019	19.2	9	1	18	22	0.30	7.90	0.30	7.90			
1344	30/01/2019	17.5	10.6	1	18	22	0.00	7.95	0.00	7.95			
1345	31/01/2019	14.6	8.4	1	18	22	0.00	10.50	0.00	10.50			
1346	01/02/2019	16.9	9.8	1	18	22	0.00	8.65	0.00	8.65			
1347	02/02/2019	18.3	10.1	0	18	22	0.08	7.80	0.00	0.00			
1348	03/02/2019	18.5	7.9	0	18	22	0.13	8.80	0.00	0.00			
1349	04/02/2019	19.7	9	1	18	22	0.43	7.65	0.43	7.65			
1350	05/02/2019	18.4	12.8	1	18	22	0.10	6.40	0.10	6.40			
1351	06/02/2019	11.5	11.4	1	18	22	0.00	10.55	0.00	10.55			
1352	07/02/2019	14.4	11.3	1	18	22	0.00	9.15	0.00	9.15			
1353	08/02/2019	13.2	8.9	1	18	22	0.00	10.95	0.00	10.95			
1354	09/02/2019	15.8	10.7	0	18	22	0.00	8.75	0.00	0.00			
1355	10/02/2019	12.8	10.2	0	18	22	0.00	10.50	0.00	0.00			
1356	11/02/2019	18.3	8.5	1	18	22	0.08	8.60	0.08	8.60			
1357	12/02/2019	17.1	8.9	1	18	22	0.00	9.00	0.00	9.00			

1358	13/02/2019	17.6	10.6	1	18	22	0.00	7.90	0.00	7.90		
1359	14/02/2019	17	11.8	1	18	22	0.00	7.60	0.00	7.60		
1360	15/02/2019	10.4	7.8	1	18	22	0.00	12.90	0.00	12.90		
1361	16/02/2019	11.6	10.8	0	18	22	0.00	10.80	0.00	0.00		
1362	17/02/2019	16.5	10.5	0	18	22	0.00	8.50	0.00	0.00		
1363	18/02/2019	17.8	10.7	1	18	22	0.00	7.75	0.00	7.75		
1364	19/02/2019	18.8	12.7	1	18	22	0.20	6.25	0.20	6.25		
1365	20/02/2019	19	13	1	18	22	0.25	6.00	0.25	6.00		
1366	21/02/2019	15.3	12.1	1	18	22	0.00	8.30	0.00	8.30		
1367	22/02/2019	18	11.4	1	18	22	0.00	7.30	0.00	7.30		
1368	23/02/2019	15.8	9.2	0	18	22	0.00	9.50	0.00	0.00		
1369	24/02/2019	18	8.8	0	18	22	0.00	8.60	0.00	0.00		
1370	25/02/2019	18.4	11.7	1	18	22	0.10	6.95	0.10	6.95		
1371	26/02/2019	18.5	16.4	1	18	22	0.13	4.55	0.13	4.55		
1372	27/02/2019	17.9	11.3	1	18	22	0.00	7.40	0.00	7.40		
1373	28/02/2019	11.6	7.5	1	18	22	0.00	12.45	0.00	12.45		
1374	01/03/2019	16	10	1	18	22	0.00	9.00	0.00	9.00		
1375	02/03/2019	17.2	11.8	0	18	22	0.00	7.50	0.00	0.00		
1376	03/03/2019	16.1	10.6	0	18	22	0.00	8.65	0.00	0.00		
1377	04/03/2019	16.2	11.9	1	18	22	0.00	7.95	0.00	7.95		
1378	05/03/2019	18.8	9.1	1	18	22	0.20	8.05	0.20	8.05		
1379	06/03/2019	17.3	12.2	1	18	22	0.00	7.25	0.00	7.25		
1380	07/03/2019	19.4	13.8	1	18	22	0.35	5.40	0.35	5.40		
1381	08/03/2019	20.4	14.6	1	18	22	0.60	4.50	0.60	4.50		
1382	09/03/2019	21.9	13.6	0	18	22	0.98	4.25	0.00	0.00		
1383	10/03/2019	18.5	13.2	0	18	22	0.13	6.15	0.00	0.00		
1384	11/03/2019	20.9	13.8	0	18	22	0.73	4.65	0.00	0.00		
1385	12/03/2019	20.8	11.5	1	18	22	0.70	5.85	0.70	5.85		
1386	13/03/2019	20.4	14.4	1	18	22	0.60	4.60	0.60	4.60		
1387	14/03/2019	19.1	12.7	1	18	22	0.28	6.10	0.28	6.10		

1388	15/03/2019	19.5	14.3	1	18	22	0.38	5.10	0.38	5.10			
1389	16/03/2019	15	12.4	0	18	22	0.00	8.30	0.00	0.00			
1390	17/03/2019	18.9	13.6	0	18	22	0.23	5.75	0.00	0.00			
1391	18/03/2019	22.8	16.6	1	18	22	2.05	2.50	2.05	2.50			
1392	19/03/2019	22.4	16.3	1	18	22	1.78	2.75	1.78	2.75			
1393	20/03/2019	22.6	15.9	1	18	22	1.78	2.90	1.78	2.90			
1394	21/03/2019	24.9	16.9	1	18	22	3.18	1.83	3.18	1.83			
1395	22/03/2019	24.2	19.2	1	18	22	3.70	0.85	3.70	0.85			
1396	23/03/2019	23.7	18.4	0	18	22	3.05	1.38	0.00	0.00			
1397	24/03/2019	16.2	15.1	0	18	22	0.00	6.35	0.00	0.00			
1398	25/03/2019	17.3	13.2	0	18	22	0.00	6.75	0.00	0.00			
1399	26/03/2019	20.7	15.1	1	18	22	0.68	4.10	0.68	4.10			
1400	27/03/2019	20	15.2	1	18	22	0.50	4.40	0.50	4.40	20.20	315.73	5527.8
1401	28/03/2019	21.6	16.7	1	18	22	1.48	2.85	1.48	2.85			
1402	29/03/2019	12.9	12	1	18	22	0.00	9.55	0.00	9.55			
1403	30/03/2019	14.1	12.7	0	18	22	0.00	8.60	0.00	0.00			
1404	31/03/2019	18.2	12	0	18	22	0.05	6.90	0.00	0.00			
1405	01/04/2019	16.2	15.7	0	18	22	0.00	6.05	0.00	0.00			
1406	02/04/2019	17.5	15.9	1	18	22	0.00	5.30	0.00	5.30			
1407	03/04/2019	17.7	15.8	1	18	22	0.00	5.25	0.00	5.25			
1408	04/04/2019	21	16.3	1	18	22	1.08	3.35	1.08	3.35			
1409	05/04/2019	15.7	16.5	1	18	22	0.00	5.90	0.00	5.90			
1410	06/04/2019	19	16.1	0	18	22	0.25	4.45	0.00	0.00			
1411	07/04/2019	21.1	18.4	0	18	22	1.75	2.25	0.00	0.00			
1412	08/04/2019	24.6	20	1	18	22	4.30	0.50	4.30	0.50			
1413	09/04/2019	21.2	17.3	1	18	22	1.43	2.75	1.43	2.75			
1414	10/04/2019	19.3	16.6	1	18	22	0.33	4.05	0.33	4.05			
1415	11/04/2019	20.3	16	1	18	22	0.65	3.85	0.65	3.85			
1416	12/04/2019	24.2	17	1	18	22	2.85	1.95	2.85	1.95			
1417	13/04/2019	24.9	19.4	0	18	22	4.15	0.65	0.00	0.00			

1418	14/04/2019	25.5	20.4	0	18	22	4.95	0.40	0.00	0.00			
1419	15/04/2019	19.8	16.9	1	18	22	0.63	3.65	0.63	3.65			
1420	16/04/2019	17.2	16.4	1	18	22	0.00	5.20	0.00	5.20			
1421	17/04/2019	21.7	17.1	1	18	22	1.63	2.60	1.63	2.60			
1422	18/04/2019	21.3	16.6	1	18	22	1.30	3.05	1.30	3.05			
1423	19/04/2019	15.9	16.2	1	18	22	0.00	5.95	0.00	5.95			
1424	20/04/2019	17.5	15.5	0	18	22	0.00	5.50	0.00	0.00			
1425	21/04/2019	17.4	13.4	0	18	22	0.00	6.60	0.00	0.00			
1426	22/04/2019	20.4	16.2	1	18	22	0.75	3.70	0.75	3.70			
1427	23/04/2019	22.4	17	1	18	22	1.95	2.40	1.95	2.40			
1428	24/04/2019	25	17.8	1	18	22	3.45	1.35	3.45	1.35			
1429	25/04/2019	26.6	22.2	1	18	22	6.40	0.00	6.40	0.00			
1430	26/04/2019	27.9	19.6	0	18	22	5.75	0.60	0.00	0.00			
1431	27/04/2019	26.4	20.1	0	18	22	5.25	0.48	0.00	0.00			
1432	28/04/2019	29.2	22.8	0	18	22	8.00	0.00	0.00	0.00			
1433	29/04/2019	30.4	23.6	0	18	22	9.00	0.00	0.00	0.00			
1434	30/04/2019	31.5	23	1	18	22	9.25	0.00	9.25	0.00			2766
1435	01/05/2019	26.9	21.5	0	18	22	6.20	0.13	0.00	0.00			
1436	02/05/2019	28.8	22.3	1	18	22	7.55	0.00	7.55	0.00			
1437	03/05/2019	25.1	19.8	1	18	22	4.45	0.55	4.45	0.55			
1438	04/05/2019	28.6	22.4	0	18	22	7.50	0.00	0.00	0.00			
1439	05/05/2019	28	20.1	0	18	22	6.05	0.48	0.00	0.00			
1440	06/05/2019	26	25	1	18	22	7.50	0.00	7.50	0.00			
1441	07/05/2019	24	20.5	1	18	22	4.25	0.38	4.25	0.38			
1442	08/05/2019	23	18.9	1	18	22	2.95	1.30	2.95	1.30			
1443	09/05/2019	24.7	19.8	1	18	22	4.25	0.55	4.25	0.55			
1444	10/05/2019	22.3	19.3	1	18	22	2.80	1.28	2.80	1.28			
1445	11/05/2019	25.4	18.5	0	18	22	3.95	0.90	0.00	0.00			
1446	12/05/2019	29.4	22.6	0	18	22	8.00	0.00	0.00	0.00			
1447	13/05/2019	31.6	25.8	1	18	22	10.70	0.00	10.70	0.00			

1448	14/05/2019	34.7	27	1	18	22	12.85	0.00	12.85	0.00			
1449	15/05/2019	37.5	28.6	1	18	22	15.05	0.00	15.05	0.00			
1450	16/05/2019	35	31.2	1	18	22	15.10	0.00	15.10	0.00			
1451	17/05/2019	37.9	28	1	18	22	14.95	0.00	14.95	0.00			
1452	18/05/2019	27.8	23	0	18	22	7.40	0.00	0.00	0.00			
1453	19/05/2019	30.5	22.6	0	18	22	8.55	0.00	0.00	0.00			
1454	20/05/2019	34.4	23.6	1	18	22	11.00	0.00	11.00	0.00			
1455	21/05/2019	32.8	27.7	1	18	22	12.25	0.00	12.25	0.00			
1456	22/05/2019	37.2	26.4	1	18	22	13.80	0.00	13.80	0.00			
1457	23/05/2019	39.5	27	1	18	22	15.25	0.00	15.25	0.00			
1458	24/05/2019	37.2	30.1	1	18	22	15.65	0.00	15.65	0.00	170.35	4.05	2212.8
1459	25/05/2019	30	24.5	0	18	22	9.25	0.00	0.00	0.00			
1460	26/05/2019	31	23.8	0	18	22	9.40	0.00	0.00	0.00			
1461	27/05/2019	34.3	25.1	1	18	22	11.70	0.00	11.70	0.00			
1462	28/05/2019	38	30.6	1	18	22	16.30	0.00	16.30	0.00			
1463	29/05/2019	41.7	32.8	1	18	22	19.25	0.00	19.25	0.00			
1464	30/05/2019	41.1	35.2	1	18	22	20.15	0.00	20.15	0.00			
1465	31/05/2019	39.9	32.4	1	18	22	18.15	0.00	18.15	0.00			
1466	01/06/2019	36	28.4	0	18	22	14.20	0.00	0.00	0.00			
1467	02/06/2019	35.2	27.9	0	18	22	13.55	0.00	0.00	0.00			
1468	03/06/2019	35.7	30.6	1	18	22	15.15	0.00	15.15	0.00			
1469	04/06/2019	30.4	28.4	1	18	22	11.40	0.00	11.40	0.00			
1470	05/06/2019	27.4	28	1	18	22	9.70	0.00	9.70	0.00			
1471	06/06/2019	33	26.8	1	18	22	11.90	0.00	11.90	0.00			
1472	07/06/2019	32.7	26.2	1	18	22	11.45	0.00	11.45	0.00			
1473	08/06/2019	36.3	29.7	0	18	22	15.00	0.00	0.00	0.00			
1474	09/06/2019	34.4	24	0	18	22	11.20	0.00	0.00	0.00			
1475	10/06/2019	35	27.4	1	18	22	13.20	0.00	13.20	0.00			
1476	11/06/2019	33.1	26.3	1	18	22	11.70	0.00	11.70	0.00			
1477	12/06/2019	28.3	26.5	1	18	22	9.40	0.00	9.40	0.00			

1478	13/06/2019	24.2	25.1	1	18	22	6.65	0.00	6.65	0.00		
1479	14/06/2019	31.3	27.9	1	18	22	11.60	0.00	11.60	0.00		
1480	15/06/2019	31.5	27.4	0	18	22	11.45	0.00	0.00	0.00		
1481	16/06/2019	31	27.2	0	18	22	11.10	0.00	0.00	0.00		
1482	17/06/2019	29.1	26.6	0	18	22	9.85	0.00	0.00	0.00		
1483	18/06/2019	32.6	27.4	1	18	22	12.00	0.00	12.00	0.00		
1484	19/06/2019	33.4	27.2	1	18	22	12.30	0.00	12.30	0.00		
1485	20/06/2019	33.6	27.1	1	18	22	12.35	0.00	12.35	0.00		
1486	21/06/2019	33.2	29	1	18	22	13.10	0.00	13.10	0.00		
1487	22/06/2019	36.4	29	0	18	22	14.70	0.00	0.00	0.00		
1488	23/06/2019	36.3	29.6	0	18	22	14.95	0.00	0.00	0.00		
1489	24/06/2019	39.5	32.7	1	18	22	18.10	0.00	18.10	0.00		
1490	25/06/2019	41.3	33.9	1	18	22	19.60	0.00	19.60	0.00		
1491	26/06/2019	40.3	32.5	1	18	22	18.40	0.00	18.40	0.00		
1492	27/06/2019	38.9	29.9	1	18	22	16.40	0.00	16.40	0.00		
1493	28/06/2019	37.6	29.6	1	18	22	15.60	0.00	15.60	0.00		
1494	29/06/2019	36.4	30	0	18	22	15.20	0.00	0.00	0.00		
1495	30/06/2019	34.8	32.4	0	18	22	15.60	0.00	0.00	0.00		
1496	01/07/2019	34.2	29.3	1	18	22	13.75	0.00	13.75	0.00		
1497	02/07/2019	34.7	29.9	1	18	22	14.30	0.00	14.30	0.00		
1498	03/07/2019	35.9	29.9	1	18	22	14.90	0.00	14.90	0.00		
1499	04/07/2019	37.0	28.9	1	18	22	14.95	0.00	14.95	0.00		
1500	05/07/2019	38.1	29.5	1	18	22	15.80	0.00	15.80	0.00		
1501	06/07/2019	38.7	33.6	0	18	22	18.15	0.00	0.00	0.00		
1502	07/07/2019	37.9	32.9	0	18	22	17.40	0.00	0.00	0.00		
1503	08/07/2019	39.9	33.5	1	18	22	18.70	0.00	18.70	0.00		
1504	09/07/2019	38.9	32.0	1	18	22	17.45	0.00	17.45	0.00		
1505	10/07/2019	39.9	30.6	1	18	22	17.25	0.00	17.25	0.00		
1506	11/07/2019	39.8	30.3	1	18	22	17.05	0.00	17.05	0.00		
1507	12/07/2019	34.2	30.2	1	18	22	14.20	0.00	14.20	0.00		

1508	13/07/2019	35.9	29.4	0	18	22	14.65	0.00	0.00	0.00			
1509	14/07/2019	31.8	28.7	0	18	22	12.25	0.00	0.00	0.00			
1510	15/07/2019	33.2	28.0	1	18	22	12.60	0.00	12.60	0.00			
1511	16/07/2019	34.5	30.2	1	18	22	14.35	0.00	14.35	0.00			
1512	17/07/2019	35.4	28.2	1	18	22	13.80	0.00	13.80	0.00			
1513	18/07/2019	32.4	28.6	1	18	22	12.50	0.00	12.50	0.00			
1514	19/07/2019	36.3	28.6	1	18	22	14.45	0.00	14.45	0.00			
1515	20/07/2019	37.2	30.3	0	18	22	15.75	0.00	0.00	0.00			
1516	21/07/2019	39.2	32.6	0	18	22	17.90	0.00	0.00	0.00			
1517	22/07/2019	38.8	32.9	1	18	22	17.85	0.00	17.85	0.00			
1518	23/07/2019	36.6	33.0	1	18	22	16.80	0.00	16.80	0.00	596.25	0.00	7874
1519	24/07/2019	37.1	32.8	1	18	22	16.95	0.00	16.95	0.00			
1520	25/07/2019	38.6	31.2	1	18	22	16.90	0.00	16.90	0.00			
1521	26/07/2019	38.4	30.9	1	18	22	16.65	0.00	16.65	0.00			
1522	27/07/2019	39.0	32.6	0	18	22	17.80	0.00	0.00	0.00			
1523	28/07/2019	39.4	30.3	0	18	22	16.85	0.00	0.00	0.00			
1524	29/07/2019	39.2	28.7	1	18	22	15.95	0.00	15.95	0.00			
1525	30/07/2019	37.3	29.3	1	18	22	15.30	0.00	15.30	0.00			
1526	31/07/2019	38.6	29.7	1	18	22	16.15	0.00	16.15	0.00			
1527	01/08/2019	38.1	28.6	1	18	22	15.35	0.00	15.35	0.00			
1528	02/08/2019	36.5	29.1	1	18	22	14.80	0.00	14.80	0.00			
1529	03/08/2019	38.2	28.9	0	18	22	15.55	0.00	0.00	0.00			
1530	04/08/2019	38.3	29.3	0	18	22	15.80	0.00	0.00	0.00			
1531	05/08/2019	36.4	30.0	1	18	22	15.20	0.00	15.20	0.00			
1532	06/08/2019	35.8	29.5	1	18	22	14.65	0.00	14.65	0.00			
1533	07/08/2019	37.1	30.9	1	18	22	16.00	0.00	16.00	0.00			
1534	08/08/2019	39.2	32.2	1	18	22	17.70	0.00	17.70	0.00			
1535	09/08/2019	40	31.8	1	18	22	17.90	0.00	17.90	0.00			
1536	10/08/2019	39.5	31.4	0	18	22	17.45	0.00	0.00	0.00			
1537	11/08/2019	39.8	34.6	0	18	22	19.20	0.00	0.00	0.00			

1538	12/08/2019	40.5	34.0	1	18	22	19.25	0.00	19.25	0.00			
1539	13/08/2019	40.3	31.9	1	18	22	18.10	0.00	18.10	0.00			
1540	14/08/2019	37.4	30.0	1	18	22	15.70	0.00	15.70	0.00			
1541	15/08/2019	35.2	28.4	0	18	22	13.80	0.00	0.00	0.00			
1542	16/08/2019	35.2	28.2	1	18	22	13.70	0.00	13.70	0.00			
1543	17/08/2019	36.1	28.8	0	18	22	14.45	0.00	0.00	0.00			
1544	18/08/2019	36.4	28.8	0	18	22	14.60	0.00	0.00	0.00			
1545	19/08/2019	32.6	28.9	1	18	22	12.75	0.00	12.75	0.00			
1546	20/08/2019	31.8	29.0	1	18	22	12.40	0.00	12.40	0.00			
1547	21/08/2019	35.6	29.1	1	18	22	14.35	0.00	14.35	0.00			
1548	22/08/2019	37.3	29.9	1	18	22	15.60	0.00	15.60	0.00			
1549	23/08/2019	38.4	31.9	1	18	22	17.15	0.00	17.15	0.00			
1550	24/08/2019	37.9	33.1	0	18	22	17.50	0.00	0.00	0.00			
1551	25/08/2019	37.5	33.2	0	18	22	17.35	0.00	0.00	0.00			
1552	26/08/2019	39.4	32.1	1	18	22	17.75	0.00	17.75	0.00			
1553	27/08/2019	38	30.2	1	18	22	16.10	0.00	16.10	0.00			
1554	28/08/2019	38.9	31.0	1	18	22	16.95	0.00	16.95	0.00			
1555	29/08/2019	38.6	30.3	1	18	22	16.45	0.00	16.45	0.00			
1556	30/08/2019	38.2	30.1	1	18	22	16.15	0.00	16.15	0.00			
1557	31/08/2019	38.2	31.4	0	18	22	16.80	0.00	0.00	0.00			
1558	01/09/2019	36.9	30.4	0	18	22	15.65	0.00	0.00	0.00			
1559	02/09/2019	37.5	28.4	1	18	22	14.95	0.00	14.95	0.00			
1560	03/09/2019	35	27.8	1	18	22	13.40	0.00	13.40	0.00			
1561	04/09/2019	34.6	28.9	1	18	22	13.75	0.00	13.75	0.00			
1562	05/09/2019	35.6	28.5	1	18	22	14.05	0.00	14.05	0.00			
1563	06/09/2019	34.6	29.2	1	18	22	13.90	0.00	13.90	0.00			
1564	07/09/2019	35.5	27.9	0	18	22	13.70	0.00	0.00	0.00			
1565	08/09/2019	36.5	29.2	0	18	22	14.85	0.00	0.00	0.00			
1566	09/09/2019	36.5	30.5	1	18	22	15.50	0.00	15.50	0.00			
1567	10/09/2019	36	29.4	1	18	22	14.70	0.00	14.70	0.00			

1568	11/09/2019	35.3	27.8	1	18	22	13.55	0.00	13.55	0.00			
1569	12/09/2019	36.1	29.1	1	18	22	14.60	0.00	14.60	0.00			
1570	13/09/2019	35.7	29.7	1	18	22	14.70	0.00	14.70	0.00			
1571	14/09/2019	33.9	28.2	0	18	22	13.05	0.00	0.00	0.00			
1572	15/09/2019	28.5	26.8	0	18	22	9.65	0.00	0.00	0.00			
1573	16/09/2019	33.1	28.3	1	18	22	12.70	0.00	12.70	0.00			
1574	17/09/2019	33.9	26.7	1	18	22	12.30	0.00	12.30	0.00			
1575	18/09/2019	35.1	27.9	1	18	22	13.50	0.00	13.50	0.00			
1576	19/09/2019	35.1	27.4	1	18	22	13.25	0.00	13.25	0.00			
1577	20/09/2019	35.4	26.5	1	18	22	12.95	0.00	12.95	0.00			
1578	21/09/2019	33.7	25.9	0	18	22	11.80	0.00	0.00	0.00			
1579	22/09/2019	31.1	26.4	0	18	22	10.75	0.00	0.00	0.00			
1580	23/09/2019	32.2	25.7	1	18	22	10.95	0.00	10.95	0.00			
1581	24/09/2019	33.4	25.5	1	18	22	11.45	0.00	11.45	0.00	707.65	0.00	8803.2
1582	25/09/2019	32.8	25.2	1	18	22	11.00	0.00	11.00	0.00			
1583	26/09/2019	30.5	27.3	1	18	22	10.90	0.00	10.90	0.00			
1584	27/09/2019	32.1	25.7	1	18	22	10.90	0.00	10.90	0.00			
1585	28/09/2019	32.9	25.7	0	18	22	11.30	0.00	0.00	0.00			
1586	29/09/2019	34.4	27.5	0	18	22	12.95	0.00	0.00	0.00			
1587	30/09/2019	34.4	27.1	1	18	22	12.75	0.00	12.75	0.00			
1588	01/10/2019	34.1	26.6	0	18	22	12.35	0.00	0.00	0.00			
1589	02/10/2019	34.2	26.6	1	18	22	12.40	0.00	12.40	0.00			
1590	03/10/2019	30.8	24.6	1	18	22	9.70	0.00	9.70	0.00			
1591	04/10/2019	32.5	24.9	1	18	22	10.70	0.00	10.70	0.00			
1592	05/10/2019	32.9	25.6	0	18	22	11.25	0.00	0.00	0.00			
1593	06/10/2019	28.5	24.9	0	18	22	8.70	0.00	0.00	0.00			
1594	07/10/2019	31.4	25.4	1	18	22	10.40	0.00	10.40	0.00			
1595	08/10/2019	29.1	25	1	18	22	9.05	0.00	9.05	0.00			
1596	09/10/2019	32.4	24.8	1	18	22	10.60	0.00	10.60	0.00			
1597	10/10/2019	33.6	24.7	1	18	22	11.15	0.00	11.15	0.00			

1598	11/10/2019	33	22.9	1	18	22	9.95	0.00	9.95	0.00			
1599	12/10/2019	35.1	28.9	0	18	22	14.00	0.00	0.00	0.00			
1600	13/10/2019	34.5	27.8	0	18	22	13.15	0.00	0.00	0.00			
1601	14/10/2019	32	27.5	1	18	22	11.75	0.00	11.75	0.00			
1602	15/10/2019	30.3	27.8	1	18	22	11.05	0.00	11.05	0.00			
1603	16/10/2019	33.6	25.6	1	18	22	11.60	0.00	11.60	0.00			
1604	17/10/2019	32.2	25.7	1	18	22	10.95	0.00	10.95	0.00			
1605	18/10/2019	26.8	23.9	1	18	22	7.35	0.00	7.35	0.00			
1606	19/10/2019	30.8	22.7	0	18	22	8.75	0.00	0.00	0.00			
1607	20/10/2019	26.9	22.9	0	18	22	6.90	0.00	0.00	0.00			
1608	21/10/2019	29.9	21.8	1	18	22	7.85	0.05	7.85	0.05			
1609	22/10/2019	19.9	23.6	1	18	22	3.75	0.00	3.75	0.00			
1610	23/10/2019	24.7	21.8	1	18	22	5.25	0.05	5.25	0.05			
1611	24/10/2019	24.8	19.5	1	18	22	4.15	0.63	4.15	0.63			
1612	25/10/2019	26.6	17.6	1	18	22	4.20	1.10	4.20	1.10			
1613	26/10/2019	29.3	21.9	0	18	22	7.60	0.03	0.00	0.00			
1614	27/10/2019	29.4	21.4	0	18	22	7.40	0.15	0.00	0.00			
1615	28/10/2019	20.1	15.5	0	18	22	0.53	4.20	0.00	0.00			
1616	29/10/2019	25.3	18.8	1	18	22	4.05	0.80	4.05	0.80			
1617	30/10/2019	26.2	20.4	1	18	22	5.30	0.40	5.30	0.40			
1618	31/10/2019	26.8	20.3	1	18	22	5.55	0.43	5.55	0.43			2563.7
1619	01/11/2019	24.6	19.5	1	18	22	4.05	0.63	4.05	0.63			
1620	02/11/2019	24.6	18.5	0	18	22	3.55	1.10	0.00	0.00			
1621	03/11/2019	25.6	16.6	0	18	22	3.45	1.80	0.00	0.00			
1622	04/11/2019	26.2	19.3	1	18	22	4.75	0.68	4.75	0.68			
1623	05/11/2019	26.4	19	1	18	22	4.70	0.75	4.70	0.75			
1624	06/11/2019	27.7	20	1	18	22	5.85	0.50	5.85	0.50			
1625	07/11/2019	29	20	1	18	22	6.50	0.50	6.50	0.50			
1626	08/11/2019	27.9	19.6	1	18	22	5.75	0.60	5.75	0.60			
1627	09/11/2019	29.3	20.2	0	18	22	6.75	0.45	0.00	0.00			

1628	10/11/2019	29.4	20.8	0	18	22	7.10	0.30	0.00	0.00			
1629	11/11/2019	29.4	19.7	1	18	22	6.55	0.58	6.55	0.58			
1630	12/11/2019	27.9	19	1	18	22	5.45	0.75	5.45	0.75			
1631	13/11/2019	27.2	18.6	1	18	22	4.90	0.85	4.90	0.85			
1632	14/11/2019	27.6	19.6	1	18	22	5.60	0.60	5.60	0.60			
1633	15/11/2019	22.3	20.7	1	18	22	3.50	0.58	3.50	0.58			
1634	16/11/2019	25	17.6	0	18	22	3.40	1.45	0.00	0.00			
1635	17/11/2019	25.9	16.3	0	18	22	3.53	1.88	0.00	0.00			
1636	18/11/2019	23.4	14.9	1	18	22	1.93	3.20	1.93	3.20			
1637	19/11/2019	24.8	14.3	1	18	22	2.48	3.15	2.48	3.15			
1638	20/11/2019	25	16.5	1	18	22	3.13	2.00	3.13	2.00			
1639	21/11/2019	23.1	15.4	1	18	22	1.90	3.03	1.90	3.03			
1640	22/11/2019	23.1	13	1	18	22	1.30	4.23	1.30	4.23			
1641	23/11/2019	22.2	12.9	0	18	22	1.05	4.50	0.00	0.00			
1642	24/11/2019	23	13.7	0	18	22	1.43	3.90	0.00	0.00			
1643	25/11/2019	20.4	12.2	1	18	22	0.60	5.70	0.60	5.70	68.93	28.30	2067.5
1644	26/11/2019	25.2	14.4	1	18	22	2.70	3.00	2.70	3.00			
1645	27/11/2019	18.5	13	1	18	22	0.13	6.25	0.13	6.25			
1646	28/11/2019	23.3	13.9	1	18	22	1.63	3.73	1.63	3.73			
1647	29/11/2019	24.7	13.4	1	18	22	2.20	3.63	2.20	3.63			
1648	30/11/2019	24.8	17.1	0	18	22	3.18	1.75	0.00	0.00			
1649	01/12/2019	24.9	15.4	0	18	22	2.80	2.58	0.00	0.00			
1650	02/12/2019	19.3	16.3	1	18	22	0.33	4.20	0.33	4.20			
1651	03/12/2019	21	12.7	1	18	22	0.75	5.15	0.75	5.15			
1652	04/12/2019	22.3	14	1	18	22	1.15	3.93	1.15	3.93			
1653	05/12/2019	17.2	15	1	18	22	0.00	5.90	0.00	5.90			
1654	06/12/2019	18.9	10.2	1	18	22	0.23	7.45	0.23	7.45			
1655	07/12/2019	20	11.3	0	18	22	0.50	6.35	0.00	0.00			
1656	08/12/2019	20.3	11.1	0	18	22	0.58	6.30	0.00	0.00			
1657	09/12/2019	16	11	1	18	22	0.00	8.50	0.00	8.50			

1658	10/12/2019	17.1	10	1	18	22	0.00	8.45	0.00	8.45			
1659	11/12/2019	14	12.8	1	18	22	0.00	8.60	0.00	8.60			
1660	12/12/2019	13.7	12.8	1	18	22	0.00	8.75	0.00	8.75			
1661	13/12/2019	18.1	10.5	1	18	22	0.03	7.70	0.03	7.70			
1662	14/12/2019	15.7	11.9	0	18	22	0.00	8.20	0.00	0.00			
1663	15/12/2019	16.4	10.4	0	18	22	0.00	8.60	0.00	0.00			
1664	16/12/2019	20.1	12.7	1	18	22	0.53	5.60	0.53	5.60			
1665	17/12/2019	21.2	12	1	18	22	0.80	5.40	0.80	5.40			
1666	18/12/2019	22.8	12.1	1	18	22	1.20	4.75	1.20	4.75			
1667	19/12/2019	22.2	10.4	1	18	22	1.05	5.75	1.05	5.75			
1668	20/12/2019	21	8.7	1	18	22	0.75	7.15	0.75	7.15			
1669	21/12/2019	20.6	9.2	0	18	22	0.65	7.10	0.00	0.00			
1670	22/12/2019	20.9	11.3	0	18	22	0.73	5.90	0.00	0.00			
1671	23/12/2019	20.7	10.9	1	18	22	0.68	6.20	0.68	6.20			
1672	24/12/2019	17.5	13.2	0	18	22	0.00	6.65	0.00	0.00			
1673	25/12/2019	14.6	8.1	0	18	22	0.00	10.65	0.00	0.00			
1674	26/12/2019	16.3	7.5	0	18	22	0.00	10.10	0.00	0.00			
1675	27/12/2019	17.1	9.5	1	18	22	0.00	8.70	0.00	8.70			
1676	28/12/2019	16.2	7.9	0	18	22	0.00	9.95	0.00	0.00			
1677	29/12/2019	16.3	9.7	0	18	22	0.00	9.00	0.00	0.00			
1678	30/12/2019	11.2	10	1	18	22	0.00	11.40	0.00	11.40			
1679	31/12/2019	16.8	9.1	1	18	22	0.00	9.05	0.00	9.05			
1680	01/01/2020	15.6	9.8	0	18	22	0.00	9.30	0.00	0.00			
1681	02/01/2020	15.4	9.3	0	18	22	0.00	9.65	0.00	0.00			
1682	03/01/2020	11.4	9.2	1	18	22	0.00	11.70	0.00	11.70			
1683	04/01/2020	15.1	8.7	0	18	22	0.00	10.10	0.00	0.00			
1684	05/01/2020	17	8.7	0	18	22	0.00	9.15	0.00	0.00			
1685	06/01/2020	15.3	12.6	0	18	22	0.00	8.05	0.00	0.00			
1686	07/01/2020	13	10.1	1	18	22	0.00	10.45	0.00	10.45			
1687	08/01/2020	8.8	8.5	1	18	22	0.00	13.35	0.00	13.35			

1688	09/01/2020	13.5	9.3	1	18	22	0.00	10.60	0.00	10.60			
1689	10/01/2020	15.1	7.7	1	18	22	0.00	10.60	0.00	10.60			
1690	11/01/2020	17.1	6.4	0	18	22	0.00	10.25	0.00	0.00			
1691	12/01/2020	15.4	7.4	0	18	22	0.00	10.60	0.00	0.00			
1692	13/01/2020	18.3	8.2	1	18	22	0.08	8.75	0.08	8.75			
1693	14/01/2020	16.7	8.7	1	18	22	0.00	9.30	0.00	9.30			
1694	15/01/2020	15.6	7.8	1	18	22	0.00	10.30	0.00	10.30			
1695	16/01/2020	13.7	9.2	1	18	22	0.00	10.55	0.00	10.55			
1696	17/01/2020	9.9	9.8	1	18	22	0.00	12.15	0.00	12.15			
1697	18/01/2020	12.4	7.9	0	18	22	0.00	11.85	0.00	0.00			
1698	19/01/2020	12.9	8.4	0	18	22	0.00	11.35	0.00	0.00			
1699	20/01/2020	11.5	7.4	1	18	22	0.00	12.55	0.00	12.55			
1700	21/01/2020	13.6	10.1	1	18	22	0.00	10.15	0.00	10.15			
1701	22/01/2020	14.7	6.4	1	18	22	0.00	11.45	0.00	11.45			
1702	23/01/2020	18.2	6.8	1	18	22	0.05	9.50	0.05	9.50			
1703	24/01/2020	11.4	8.2	1	18	22	0.00	12.20	0.00	12.20			
1704	25/01/2020	15.6	3.8	0	18	22	0.00	12.30	0.00	0.00			
1705	26/01/2020	17	6.4	0	18	22	0.00	10.30	0.00	0.00			
1706	27/01/2020	17.7	8.4	1	18	22	0.00	8.95	0.00	8.95	14.25	321.78	6981

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