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Implementing Energy Efficiency Standard in Buildings: Occupants Awareness and Challenges

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Abstract

There is an urgent need for the Malaysian building sector to reduce its energy consumption and greenhouse gases (GHG) emissions, in reaching Malaysia's target in the reduction of 45% carbon emission by 2030 pledged to the United Nations Framework Convention for Climate Change (UNFCCC). In proving Malaysia's commitment to the United Nations, the 3rd biennial report to the UNFCCC has indicated several mitigation actions including executing the National Energy Efficiency Action Plan (NEEAP), among others. NEEAP has targeted 5 key initiatives in which one of them identifies incorporating energy efficiency (EE) strategies in new buildings. Malaysian Standard MS 1525: 2019 for energy efficiency and use of renewable energy for non-residential buildings is a voluntary standard, providing the criteria and minimum standards for EE in the design of new buildings and retrofit of existing buildings. Recommended as a reference for stakeholders concerning EE in buildings, this study focuses on identifying the occupants' awareness level and further elaborates on the challenges and strategies when the standard is imposed within their premises. The methodology applied was a quantitative study targeting employees as respondents in a city council. The findings from the questionnaire survey distributed will ascertain how the MS 1525: 2019 can help increase the level of awareness as well as identify the challenges and issues pertaining to the EE agenda and strategize the effective implementation of the standard. At the moment, EE regulation is limited and focuses on consumer consumption. Therefore, this study will propose recommendations extracted from the findings which would mainly focus on consumer awareness, towards the betterment of EE regulations in Malaysian buildings.

Keywords: Awareness, building, challenges, energy efficiency, MS 1525: 2019

1.0 INTRODUCTION

Despite significant progress over the past decade on improving access to electricity, the world is still falling short in providing affordable, reliable, sustainable, and modern energy for all (United Nations, 2021). In 2020, the United Nations Environment Programme (UNEP) reported that global electricity consumption increased to 55% compared to 51% in the year 2018 (Allen et al., 2018; UNEP, 2020). Electricity consumption in building operations alone represents nearly 55% of the overall global electricity consumption (UNEP, 2020). During the 21st Conference of the Parties (COP-21) 2015, held in Paris, France, Malaysia pledged to target the reduction of 45% carbon emission by 2030, reporting to UNFCCC (MITI, 2017).

Policies and programmes were crucial in the efforts towards addressing the energy sector. With the establishment of NEEAP in 2015, one of its aims was promoting EE within all premises encompassing managing electricity on the demand-side efficiently to improving EE by pursuing identified implementation measures (KETTHA, 2015). Whilst the action plan would take 10 years to realize, the main objective was to reduce energy and electricity consumption by 8% by 2025 whilst incorporating EE as part of the strategy (KETTHA, 2015).

As one of the guiding principles of the NEEAP, the plan was also to increase the participation of stakeholders for more effective implementation of the EE initiatives. This, in turn, suggested awareness and knowledge be a crucial part of the promotion. Therefore, for purposes of designing EE in buildings, the Malaysian Standard MS 1525: 2019 for energy efficiency and use of renewable energy for non-residential buildings is currently referred to in Malaysia as a guide for stakeholders (KETTHA, 2015). Stakeholders would need to be more aware of the standard for effective implementation within their premises. Hence, the objective of this study is to obtain data on the level of awareness of the respondents working within an office environment whilst implementing the MS 1525: 2019 within their premises. Identifying the challenges and issues pertaining to and strategizing effective implementation of the standard would also contribute to the subsequent EE regulation for buildings in Malaysia.

2.0 LITERATURE REVIEW

In Malaysia's 3rd biennial report to the UNFCCC, several mitigation actions were implemented including the NEEAP in its efforts to impose certain standards on appliances as well as enhance EE implementation in buildings (UNFCCC, 2020). The NEEAP 2016-2025 was also launched due to Malaysia's inability to show any improvements in terms of energy consumption and conservation as well as lower than anticipated results under previous energy efficiency initiatives (Rahman et al., 2019). Hence, NEEAP identified the 5th key initiative that is by applying Malaysian Standard MS 1525: 2019 which is called Code of Practice on Energy Efficiency and Use of Renewable Energy for Non-Residential Buildings. Introduced in 2001, this MS is used as a guide in designing EE buildings incorporating the latest in technological development (KETTHA, 2015). However, in 2012, the promotion of EE in new commercial buildings was incorporated in the amendment to the Uniform Building By-Laws (UBBL) by Section 38A (Warta Kerajaan Persekutuan, 2021). In this section, overall thermal transfer value, roof thermal transfer value, and energy management system were mentioned. The section addressed only for new or renovated non-residential buildings and only certain aspects referring mainly to MS 1525: 2019. It is also noted that Building Energy Index (BEI) by the Energy Commission (EC) was introduced as a benchmarking tool in monitoring building energy performance mainly for government buildings.

According to Suruhanjaya Tenaga (2019), the challenge with the current situation is that while demand will keep on rising as the economy grows, supply in generating the electricity is depleting. Therefore, implementing action plans and standards are major steps toward addressing the EE agenda with strategic plans followed through. It is also equally important to manifest environmental awareness amongst Malaysians, more holistically. This includes improving policymaking by blending awareness and behaviour performance into the Malaysian culture (Neo et al., 2016). According to Salvia et al. (2021), in terms of policy implications, capacity building is an effective means of increasing EE and should be strengthened among professionals and staff and applied amongst public authorities as well. This was also addressed by the EC in the efforts to enhance the consumers' awareness of energy efficiency such as continuous campaigns, encouraging energy-saving measures, managing practises, purchasing MEPS equipment, energy auditing amongst others (Suruhanjaya Tenaga, 2019). Determining the level of awareness and adoption of factors contributing to sustainable construction by practitioners will serve as a guide to industry practitioners regarding issues to integrate into design and construction projects from inception to completion (Amuda-Yusuf et al., 2020).

Changes in human behavior can increase the efficiency of the energy used in the building (Paone & Bacher, 2018). Habitual actions in energy-saving practices were found to have a great effect on a buildings' energy performance when the buildings management team also practices the same (Azizi et al., 2019). The management can examine the occupants' energy-saving behaviour and consider intervention strategies in changing the occupants' habits.

In Malaysia, there are many other possible intervening factors such as social-psychological reasons affecting the environmental intentional behaviour (Neo et al., 2016). Energy awareness towards energy saving requires an appropriate attitude and human behaviour of the inhabitants (Rahman et al., 2016). Furthermore, the recommendation for empowering energy conservation as part of employees' responsibility regarding energy conservation will be more effective by spreading conservation messages and information, taking part in energy reduction plans as well as establishing energy usage data (Baharum et al., 2016). It is believed that by teaching users good practices as well as by increasing public awareness in this matter, potential energy savings can be achieved (Herrando et al., 2016).

In a study concerning green building, taking the levels of building stakeholders' motivation into account introduces more structure and accountability into the design of policies aimed at motivating the adoption of green buildings (Olanipekun, 2016). Olanipekun (2016) further elaborated that intrinsic motivation goes with environmental activism which would lead to a feeling of satisfaction. Whereas, organizational support, stakeholder, and regulatory pressure also have a positive impact on the implementation of any environmental practice when established within an organization (Yusof et al., 2016).

Lack of proper leadership in government or political parties is a barrier in EE programs. Perceived lack of empowerment or decision making in an organization, insufficient and inefficient approach of top management, fear of losing support by leadership or top management, and differences in perception of managers among others are priorities in the decision-making approach to overcome the challenges (Gupta et al., 2017). This includes a lack of coordination among different departments or agencies and stakeholders which can be overcome by the governments' role in promoting environmental integration with EE (Gupta et al., 2017). Encouragement from the top-down administration, as well as the bottom-up citizen participation, might be a perspective that can ensure directives be efficiently promoted and fulfilled (Ouyang et al., 2020). In the aspect of awareness of sustainable practices within the industry, stakeholders should direct efforts towards organizing seminars, conferences, and workshops centred on sustainability in the built environment through the various professional bodies at state and local government levels (Amuda-Yusuf et al., 2020). Therefore, with the stakeholders in mind, there is a need to measure the level of awareness on EE and the standard applied in Malaysian buildings.

3.0 METHODOLOGY

From past studies shown, the level of awareness of EE standards in Malaysia is determined by the implementation of policies and the spreading of knowledge. Malaysia refers mainly to MS 1525: 2019 guideline when it concerns EE policies in buildings. The occupant's awareness on the subject of MS 1525: 2019 may bring impact to implementing the standard effectively. Therefore, the knowledge pertaining to the EE standard as well as the implementation of the EE guideline and policies within the building sector would contribute to the level of awareness on the subject matter. Thus, this gives a major impact on the stakeholders' awareness of EE. The scope of this study targeted a city council providing public service to the local community. With 183 buildings and facilities owned by the organization, it has begun implementing a programme incorporating the implementation of MS 1525: 2019 as part of its efforts in reducing GHG emissions. The methodology adopted was a quantitative approach using descriptive analysis. Though the questionnaires were for measuring their level

of awareness, the questions posed in the survey were mainly to gain responses concerning the standard. Due to the Covid-19 pandemic, this research applies the questionnaire survey using the online method. Malaysia's lockdown was enforced and respondents who had access to a computer and internet were attending online from home. Therefore, this became a limitation to the study.

The targeted respondents for this study were the employees attached to the city council with the majority of the targeted attendees from the technical field. The questionnaire survey was distributed to employees from all levels of position, directed specifically from the technical departments within the organization. Receiving 53 responses out of 80 attendees, this constituted 66.2% of respondents from the overall attendees of the online seminar.

In this survey, the questionnaire featured 24 short questions. From the overall 3 sections, the first section comprised demographic information covering gender, age, education qualification, and years of working experience. The next section delved into the level of awareness on energy management and implementation of MS 1525: 2019 applying the 5-point Likert scale, followed by the challenges faced by the respondents in implementing MS 1525: 2019. Finally, the recommendation for strategies in effectively implementing the standard concluded the survey. Different types of closed-ended questions were applied, from ticking the appropriate response to an agreement scale from “strongly disagree”, “disagree”, “do not agree or disagree”, “agree” to “strongly agree”. The questionnaire also contained a few open-ended questions so that the respondents were able to express beyond the responses to the closed-ended questions thus allowing the respondents to express their current needs and experiences.

The findings would be able to indicate their awareness as well as issues and challenges faced in implementing the standard within their organization. It is suggested that such study on awareness amongst stakeholders especially in organizations, were needed to be ascertained.

4.0 FINDINGS

The questionnaires were divided into 3 main sections in relation to the aim as well as objectives and the findings were revealed as the following.

4.1 Level of Awareness on Energy Management and Implementation of MS 1525: 2019 in Buildings

In the first section of the questionnaire survey, it addressed the level of awareness on energy management and the implementation of the EE standard in buildings. Four questions were posed such as importance in practicing energy management, exposure to EE standards and policies, the importance of implementing EE standards, and practicing good energy use in an organization. Figure 1 shows the importance of practicing energy management in the organization in which the majority constituting N= 39 (73.6%) respondents strongly agree with the suggestion. As many as N=34 (64.2%) respondents strongly agreed to the exposure and knowledge on EE standards. This indicated that the majority of the respondents acknowledged acquiring additional knowledge on the standard. Another aspect that seemed to be acceptable by the respondents was the importance of implementing the standard and policy within the organization as many as N=38 (71.7%). This indicated that respondents were very much in agreement with implementing the standard and imposing EE policies as guidance to the organization. In fact, imposing a well thought or strategic plan would assist in implementing knowledge, competence, and finally expertise in stages to identified individuals in managing energy well within the building. Whereas practicing good energy use in the building is strongly agreed upon in the majority N=41 (77.4%) of the respondents. This indicated that the respondents concurred with the execution of good energy usage by applying the EE standard.

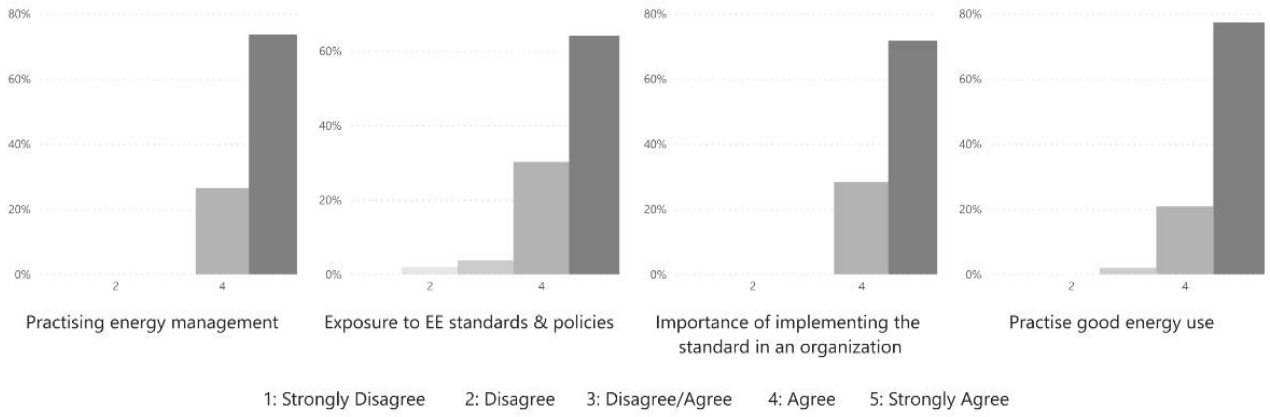

Figure 1 Findings on practising energy management, exposure to EE standards and policies, importance of implementing the standard and practising good energy use

Referring to Table 1, it is found that nearly half of the respondents N=26 (48.88%) concurred in practising good energy consumption with several recommendations suggesting basic action-oriented such as switching off lights, equipment, and limiting usage of components as the main recommendation to saving and good energy consumption. Office equipment such as computers or printers were not switched

off when not in use and the users confirmed that computers were usually not disconnected overnight. It is found that when the office equipment is not switched off or disconnected over time, there would be a significant indication of energy consumption amongst the electrical equipment. The respondents indicated the realization of the lack of monitoring and practise which needs to be part of their daily practise within their organization which may contribute to a reduction in energy consumption and subsequently electricity bills.

Table 1 Suggestions by the respondents on methods on good energy usage

Nos.	Responses received	%
1.	Switching off lights, equipment, sockets and limit usage of electricity	48.88
2.	Use green technology (energy saving) with energy-saving rating and specification	20.00
3.	Behavioural change and sense of responsibility	8.88
4.	Awareness campaign & enforcement	6.66
5.	Use more natural lighting in consideration of the environment.	6.66
6.	Other recommendations such as attending seminars and talks to acquire knowledge, installing photovoltaic as alternative energy and additional income to the organization, methods in savings, and avoiding wastage	8.88

As part of supporting energy-saving measures, the administration of the organization has imposed minimum energy performance standard (MEPS) using star ratings in equipment such as in air conditioning. Applying energy saving requirement have been indicated to assist in the reduction of GHG emission as well as energy consumption and costs as mentioned in NEEAP in the long run. Respondents as many as N=11 (20%) agreed with the introduction of green technology, which also included the use of LED lightings or others that can preserve the resources and reduce the negative impact to the environment.

As many as N=5 (8.88%) respondents mentioned the need for behavioural change and inculcating good habits. With the knowledge gained through seminars and awareness programmes, the feeling for a sense of responsibility would be instilled within the employees and may be shared amongst others outside the working environment. As recorded N=4 (6.66%) respondents suggested awareness campaigns. This is possible through the spread via social media and even advertising campaigns through posters or magazines in the attempt to gain attention in spreading information. Respondents as many as N=4 (6.66%) suggested natural lighting and reducing the use of artificial lighting as part of their efforts in saving the environment. Other less mentioned suggestions were such as installing photovoltaic as an alternative energy source as additional income to the organization as well as applying methods in savings and avoiding wastage.

4.2 Issues and Challenges in Implementing MS 1525: 2019 in an Organization

The next section addressed the current issues and challenges that the employees faced in the organization with regards to implementing MS 1525: 2019 as well as EE policies. This section posed four questions comprising of top management support to applying EE standard, lack of staff and focus, ignorance and disobedience to adhering to the standard, and priorities on other issues. In Figure 2, the majority of the respondents N=34 (63.5%) strongly agreed in receiving support from top management implying that continuous support from the top tier management is very important in ensuring the success in implementing the EE standard. Strong support and leadership from the top management would empower the employees at all levels to push the agenda of EE in the organization.

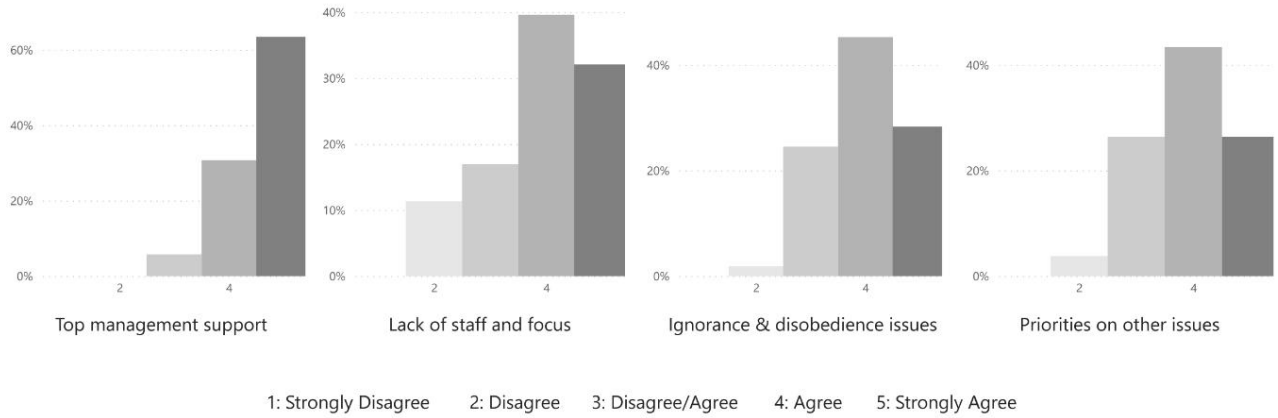

Figure 2 Findings on top management support, lack of staff and focus, ignorance and disobedience, and priorities on other issues

Whereas the majority of the respondents N=21 (39.6%) also agreed that lack of focus as well as identifying employees specializing in the EE field were amongst the main challenges in successfully implementing the standards in an organization. Also, it is found that nearly half of the respondents N=24 (45.3%) agreed that both ignorance and disobedience were issues that hindered the implementation of MS 1525: 2019 in an organization. The majority of the respondents N=23 (43.4%) also concurred in their view that EE implementation was

lacking in prioritization. It may also be due to the fact that other responsibilities in their job scope required the respondents to concentrate on other more pertinent matters.

From Table 2, several main issues were highlighted in identifying challenges and difficulties in implementing the standard. A majority of the respondents N=20 (37.77%) perceived attitude as a problem amongst staff. Sense of responsibility, realization and not adhering to instructions constituted an attitude problem.

Understanding how important EE awareness and applying the standards contribute to the well-being of the organization and the need for change in behavioural mannerism and mindset in implementing the standard needed to be addressed (Baharum et al., 2016). This common factor constituted N=13 (24.44%) responding to the lack of awareness and knowledge as well as understanding in the application of the standard within the working and built environment. This suggested that educating the stakeholders as a prime activity amongst employees who are the main stakeholders in an organization would be mutually beneficial for the stakeholders in an organization and the environment.

Table 2 Responses on challenges and difficulties faced by the respondents in implementing MS 1525: 2019

Nos.	Response received	%
1.	Attitude problem, sense of responsibility & realization	37.77
2.	Lack of awareness, knowledge, understanding, and practise amongst staff	24.44
3.	Lack of cooperation or teamwork in the organization	11.11
4.	Other challenges such as high capital investment, lack of prioritization, motivation by recognition or incentive, lack of focus and monitoring by management, lack of understanding good maintenance and schedule energy audit, seminars and workshops as well as campaigns using social media platforms	26.68

Referring to Table 2, N=6 (11.11%) of the respondents suggested lack of teamwork and cooperation amongst members of staff were identified as equally highlighted as a major challenge to this issue. Participatory approaches are very effective means of promoting the active involvement of users by increasing their motivation and promoting a lasting change in habits that leads to energy savings (Graves & Sarkis, 2018). However, the respondents also suggested several other challenges such as the need to address initial capital investment for improvements towards the EE exercise as well the lack of focus due to having existing job scope which also constituted as an issue amongst the employees.

4.3 Expectation of the Organization

Figure 3 shows four questions comprising on whether MS 1525: 2019 can assist in the long-term objective in reducing CO2 emission, policies assisting EE management, strategic partnership with stakeholders, and establishing a data collection centre for monitoring energy consumption. The majority of the respondents N=40 (75%) strongly agree that MS 1525: 2019 can assist on the long-term objective in reducing carbon emission. This indicated that a majority of the respondents understood the aim and objective of the standard and supported it. When implementing standards or policies concerning energy consumption or management in buildings, it would include good practises, awareness-raising measures, hands-on sessions of energy management which may include management software programmes, and selected good practises promoting behavioural changes towards the targets (Salvia et al., 2021). Also, as many as N=33 (62.3%) respondents strongly agreed that the proposal of imposing policies would improve EE management in buildings.

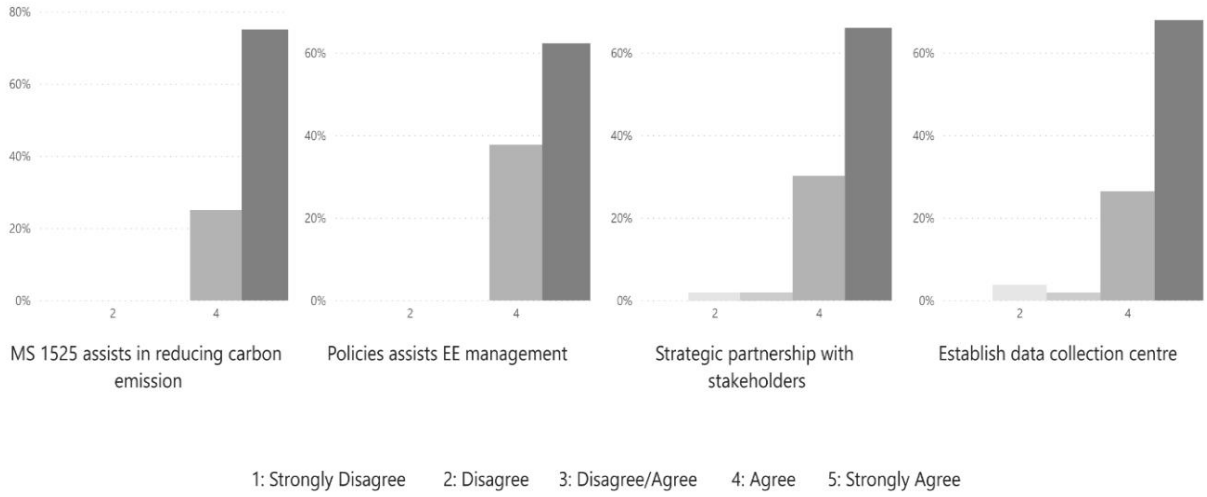

Figure 3 Findings on MS 1525: 2019 assist in reducing CO2 emission, policies assist EE management, strategic partnership with stakeholders, and establishing data collection centre

Whereas N=35 (66%) of the respondents agreed that strategic partnership with stakeholders is one example of a pilot project in supporting the standard imposed in buildings, as many as N=36 (67.9%) responses concurred in establishing a data collection centre. The purpose is to monitor data collection of energy consumption during the lifetime of the built structure. In the long term, the data can become a useful reference in the monitoring of the building's energy consumption and identifying ways in improving energy usage.

Referring to Table 3, in their proposal for effective implementation of the standard, respondents proposed methods on distribution information and knowledge. Spreading awareness by campaigning and promotion was the most popular suggestion by the respondents N=38 (17%). Using social media platforms such as Facebook, Instagram, or any other popular platforms, sustainability awareness including green, and EE can be taken advantage of in spreading information, messages, and up-to-date news.

As many as N=7 (13.20%) responded by suggesting educating employees through organized seminars and workshops established within a programme that can be planned at either short or long periods of time (ESMAP, 2019). As proposed by respondents N=5 (9.43%), this will further be enhanced with efforts by in-house experts or employees that are within the field of knowledge or employees who have basic knowledge but are willing to learn.

Table 3 Strategies in effective implementation of MS 1525: 2019 in an organization

Nos	Responses received	%
1.	More effective distribution of information such as promotion, campaigns, and social media to spread information	17.00
2.	Educate, understand MS 1525: 2019 and exposure as well as organize talks, seminars, workshops, and Programs	13.20
3.	Identify "persons -in-charge" (PIC) within departments as well as person(s) in leading the agenda or ambassador	9.43
4.	Integration of expertise and efforts within the organization and appoint 3rd party if required	9.43
5.	Incentives, rewards, recognition as motivation	9.43
6.	Establish a main and working committee as well as top management to drive and lead the agenda	7.55
7.	Inculcate green habits and culture within the organization	5.66
8.	Enforcement and penalty as punitive action	5.66
9.	Other factors are to provide digital platform or systems for monitoring purposes, consider natural environment and introduce alternatives (solar), identify pilot projects, energy audit, change equipment to energy/star rated, follow procedures as instructed	22.64

As many as N=5 (9.43%) respondents also suggested identifying persons in charge within each department, believing that this will assist in the process of speeding up the implementation of the standard and policy. Another recommendation is by way of incentivizing staff members. It is found to be a motivational factor when recognizing efforts by individuals or groups in an organization. Support by the management, punitive actions against those not practising the policy, and recognizing those by way of rewards or monetary incentives play important roles in strengthening the organizational climate towards environmental awareness (Xu et al., 2017). Another suggestion that could also support the agenda is to identify pilot projects to act as a showcase, incorporating a more detailed strategic plan such as an action plan, energy-saving measures, timeline as well as financial and human resources allocation.

5.0 DISCUSSION

This paper presented a study conducted on the building users towards MS 1525: 2019 implementation, in order to provide the research community with a better understanding of the impact it has on energy consumption, management, practices, and future potential research activities. The central focus here is to identify the occupants' awareness level and further elaborate on the challenges and strategies when the standard is imposed within an organization.

Ideally, establishing a planned roadmap with action plans for EE would be a good guide to assist in monitoring as well as steering the course for the EE practises in an organization. Though the NEEAP constituted a more holistic plan on a national level, referring to it as a guide may have assisted stakeholders in implementing the plan in a more strategic way forward.

In the section on level of awareness, the respondents strongly concurred with practising and implementing energy management in their organization. This indicates that with the exposure to knowledge concerning managing energy, the employees were willing to practise implementing it. In fact, knowledge gained through attending seminars and workshops would present a better understanding of the goal for EE. With the standard and policies in place, this would further enhance its presence in the working environment. Parallel to that, behavioural habits such as switching off lights and other electrical equipment when not in use constituted a sense of responsibility towards energy management. Prior to the execution of this study, the literature review revealed that good habits in energy management enhanced the energy performance of a building and in turn, allowed the owners to reap rewards from the savings gained. However, the respondents highlighted that attitude problem and sense of responsibility was an issue amongst the employees. As mentioned, human behaviour especially in enhancing positive attitude is a grave challenge to overcome by the employees to ensure its success.

Further motivation is when top management shows their support. Leadership by example in governing and leading this agenda would be an important factor in assisting to push the agenda forward. This translates to overseeing through a top-down administration as well as an inter-departmental coordinated effort. Good coordination such as teamwork between different departments, agencies, and stakeholders led by a definitive and strong leader upholding the EE agenda would be exemplary. In the NEEAP, the suggestion between the government and public agency through a smart partnership collaboration as well as identifying a pilot project would be a step forward towards EE.

Though there is a lack of focus when given the task due to other priorities, the employees can overcome this by taking the opportunity of concentrated efforts in moving the EE agenda. Involving the employees in programmes such as energy reduction plans and sharing information would ensure its success with their engagement and involvement.

By applying this standard, Malaysia's target in the reduction of carbon may be reached as the standard addressed buildings which are the major contributors to carbon and GHG emission. Therefore, imposing the standard alongside policies is the correct path towards EE. Information and data on energy usage should be collected and analysed for the betterment of the building's energy consumption. Application using a tool such as software programmes in the collection of energy data would assist in monitoring a building's efficiency. However, the management would need to identify a strategy in data collection especially when there are cross-references in different departments and buildings.

Finally, in encouraging employees practising EE and good energy management in their organization, it would be motivational to recognize employees through awards or by incentivizing the employees. By recognizing their efforts, it would be a boon for the employee and also exemplary to others in the organization.

The standard MS 1525: 2019 is meant only as a guide for stakeholders and especially those in the building sector. Stakeholders are not obligated in applying the standard mainly because it is non-mandatory. The most important fact which remains is that Malaysia has yet to establish any legislation that addresses EE in buildings. Even with the UBBL, NEEAP, and the MS 1525: 2019 as the main referral to stakeholders especially in the building sector, Malaysia would have to push for the agenda to establish the EE legislation specifically for buildings to ensure meeting the government's goal in the reduction of carbon emission.

6.0 CONCLUSION AND WAY FORWARD

Malaysia has made a strong commitment to UNFCCC in its reduction of GHG. Due to this obligation to the UN, Malaysia has taken several mitigation actions in addressing the GHG emission which included waste, forestry as well as the energy sector. In enhancing the EE action plans for buildings, under the NEEAP, it is noted that within 10 years from 2016, this action plan is expected to assist in the reduction of carbon and GHG emission. One of the plans is to enforce several provisions in MS 1525: 2019 by the introduction of Section 38A in the UBBL. However, the UBBL also recognizes only a few aspects from MS 1525: 2019 with regards to both new buildings and retrofitted buildings. Nevertheless, Malaysia currently still lacks an EE legislation and instead refers to MS 1525: 2019 only as a guideline to EE in buildings. Without the EE law in place, Malaysia's target of reducing carbon emission in the building sector will be hindered indefinitely. Therefore, it is pertinent that the EE legislation is to be established for that purpose.

Alternatively, in a long-term action plan, the most effective strategy is to provide a complete roadmap that should include activities such as capacity building as well as enhancement of knowledge and awareness amongst the stakeholders. This is indicated in the UNFCCC biennial report to the UN. Leading by example, especially involving top management would also indicate the commitment of the organization to the agenda. This would motivate them further towards the EE agenda. It is pertinent that through communication and coordination inter-departmental or inter-governmental, this plays an important role as to spread awareness in the promotion of environmental integration involving EE especially in buildings. With the basis on addressing the stakeholder's awareness on MS 1525: 2019 as crucial, therefore its implementation plays a salient role in the reduction of the building sector's energy usage and eventually, GHG emissions.

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