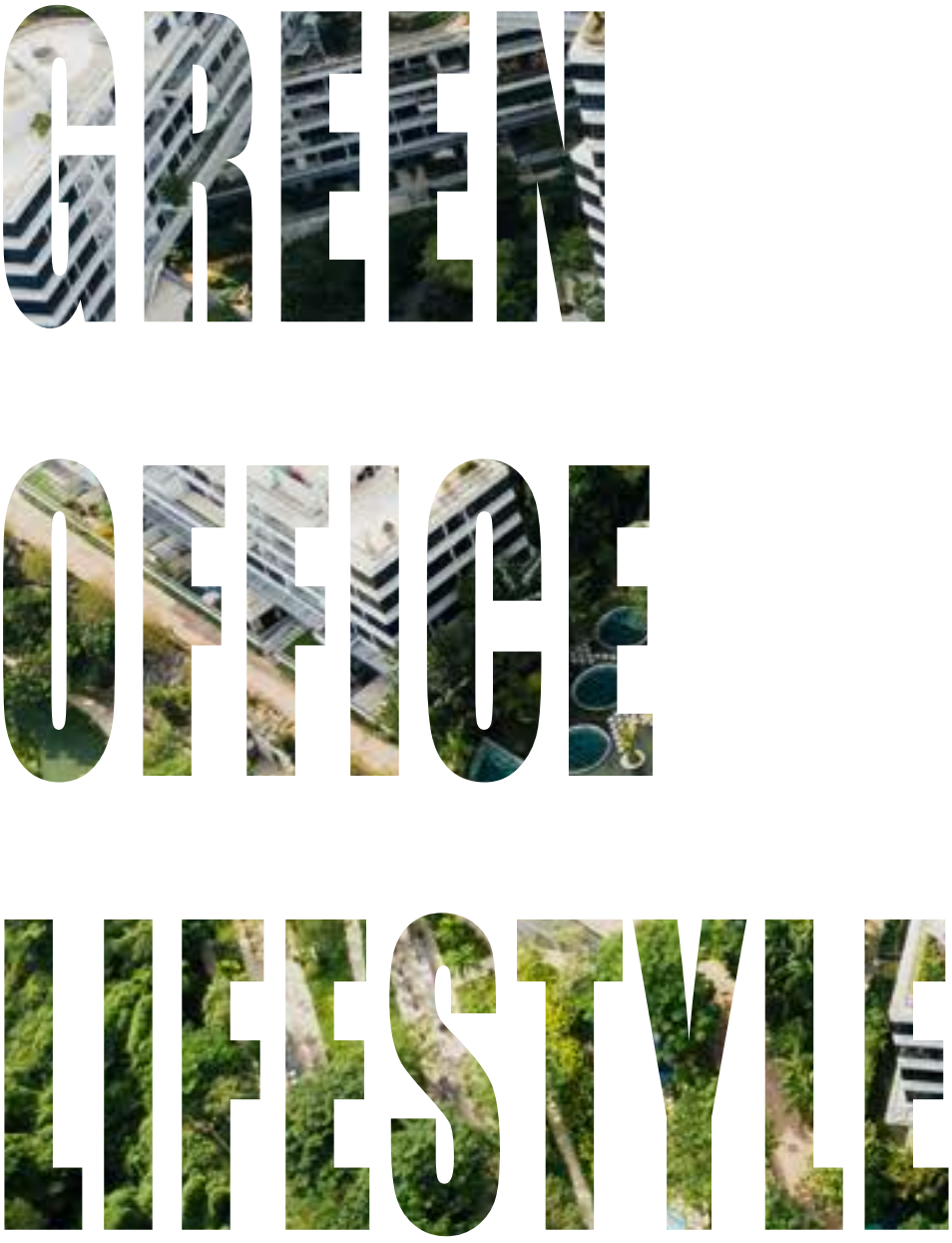
Guideline on Green Office Criteria & Lifestyle



The Initiative "Upscale and Mainstream Green Office Lifestyles in Vietnam"

10YFP Sustainable Lifestyles & Education Programme | One planet live with care | AIT-VN Asian Institute of Technology in Vietnam | GO green office

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APPENDIX

Abbreviation

AIT-VN (AITCV)	Asian Institute Of Technology Center In Viet Nam
GO	Green Office
CC	Climate Change
CO_2	Carbon Dioxide
GJ	Giga Joules (equivalent to 109 joules)
Gg	Giga grams (tương đương 10^9 grams hay 1000 tấn)
INDC	Intended Nationally Determined Contributions
IPCC	Intergovernmental Pannel on Climate Change
GHG	Greenhouse Gas
SD	Sustainable Development
tCO_2	Ton carbon dioxide
tCO_{2e}	Ton carbon dioxide equivalent
TJ	Tetra Joules (equivalent to 10^{12} joules)
WRI	World Resources Institute
WBCSD	World Business Council for Sustainable Development

I INTRODUCTION

I.1 Global issues and Sustainable Development

Since United Nations Conference on the Human Environment held in Stockholm in 1972, environmental problems have become one of the key themes to be discussed at a variety of international conferences. Human being has faced different global environmental challenges at different stages of socio-economic development. In the period of 1970 – 1980, industrial pollution was the key challenge to be addressed; and during 1990 – 2010, the issues were biodiversity degradation, climate change and desertification.

In recent years, due to globalization, the increasing population, the rapid urbanization and the growing middle class, global environmental issues are changing in a complicating way, which has created new challenges for mankind.

Climate change (CC)

The increase in human activities generating greenhouse gas (GHG), over-exploitation of GHG tanks (such as biomass, forests, coastal ecosystems…) and other human activities play major roles to the global climate change.

The most obvious effects of climate change are global warming, melting ice, rising sea levels, extreme weather causing natural disasters and calamities, especially storms, floods and droughts, prolonged cold, earthquake and tsunami. These are increasing and seriously affecting the economy, society and life of humans, animals and plants.

Climate change causes global environmetal impacts, especially on human life, agricutural production, biodiversity and water resource. According to the 4th report of Intergovernmental Panel on Climate Change (IPCC), extreme weather is likely to increase significantly in both intensity and frequency, which has caused severe threats to most of countries, including their prosperity, livelihoods of the poor and developing countries. Climate change is not only threatening lives of the present generations but its long-term implications can potentially destroy lives of the future generations.

BOX 1: CLIMATE CHANGE HAS DRIVEN THE STRENGTH OF STORMS

The emergence of Typhoon Maria shortly after Hurricane Irma and Hurricane Harvey raised a concern over the relationship between the rise of storms with increasingly intense and frequency with climate change and global warming.

Hurricane and consecutive storms occurred continuously, resulting in massive destructive impact in the Caribbean area and the Gulf of Mexico in a short time. Just a few weeks after Hurricane Harvey hit Texas, Hurricane Irma again formed and swept the Caribbean countries before landing in Florida. Both of them were Category 5 hurricanes which were the most severe throughout the history in the area. As a consequence, dozens of people were killed and damage of more than $ 200 billion was caused. Meanwhile, India and South Asian countries also experienced severe floods. The worst flooding disaster out of many years took away more than 1,400 lives and homes of million people.

According to experts, climate change, in particular global warming, can affect storms by factors such as warmer sea surface accumulates more energy, warmer air holds more moisture. Like in the Gulf of Mexico, where two hurricanes Harvey and Irma have just passed, the weather temperature was 2-4oC higher than the same period in history. The difference in temperature affected the speed of the winds, making them stronger than ever.

Although climate change is controverisal, the general consensus among scientists is that climate change and global warming are making storms stronger and more frequent.

Source: https://vtv.vn/the-gioi/bien-doi-khi-hau-dang-khien-cac-con-bao-manh-len-20170920181435574.htm

Sustainable Development (SD)

The concept of "sustainable development" has emerged in the environmental movement since the early 70s of the 20th century. In 1987, in the report "Our Common Future" by the World Council on Environment and Development (WCED) of the United Nations, Sustainable Development (SD) was defined as " Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

The sustainable development concept was reaffirmed at the Earth Summit on Environment and Development held in Rio de Janeiro (Brazil) in 1992 and further amended at the World Summit on Sustainable Development in Johannesburg, South Africa 2002: Sustainable development is a combination of 3 aspects, including economic development (especially economic growth), social development (especially progress, social justice, poverty reduction and job creation) and environmental protection (especially mitigation, remediation, rehabilitation and improvement environmental quality, forest fire prevention and deforestation, effective exploitation and use of natural resources).

Indicators for SD are decent economic growth; good imlementation of social progress and justice; effective exploitation and use of natural resources; preservation and enhancement of environment quality. SD is now agreed by all countries to become strategic orientation to address global challenges.

I.2 Efforts to promote Sustainable Development and Adaptation to Climate Change

a. International efforts

Since the UN Conference on Environment and Development in Rio de Janeiro in 1992, the world has been aware that unsustainable production and consumption patterns are main causes of environmental degradation. In the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002, the Plan of Implementation was approved with a call for action to “encourage and promote the development of a ten-year framework of programmes in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production to promote social and economic development within the carrying capacity of ecosystems by addressing and, where appropriate, decoupling economic growth and environmental degradation”.

On January 1st 2016, 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development — adopted by world leaders in September 2015 at an historic UN Summit — officially came into force. Over the next fifteen years, with these new goals that universally apply to all, countries will mobilize efforts to end all forms of poverty, fight inequalities and tackle climate change, while ensuring that no one is left behind. While the SDGs are not legally binding , governments are expected to take ownership and establish national frameworks for the achievement of the 17 Goals.

Figure 1. 17 Sustainable Development Goals

Countries have the primary responsibility for follow-up and review of the progress made in implementing the Goals, which will require quality, accessible and timely data collection. Regional follow-up and review will be based on national-level analyses and contribute to follow-up and review at the global level.

The 21st United Nations Framework Convention on Climate Change (COP 21) in Paris succeeded and approved the Paris Agreement on Climate Change. This is a historic agreement because for the first time all 196 participating countries in the United Nations Framework Convention on Climate Change (UNFCCC) have agreed to cut carbon emissions in order to hold the increase in the global average temperature this century "well below 2° C", and as close to 1.5° C as possible compared to pre-industrial levels [1].

b. Vietnam's efforts

In 2011, the Prime Minister of Vietnam approved the Vietnam National Strategy for Climate Change with four specific objectives as follows:

- To assure food security, energy security, water source security, hunger eradication and poverty reduction, gender equality, social security, community health, improve living standards and protect natural resources in the context of climate change;
- A low-carbon economy and green growth will become a primary trend in sustainable development; GHG emission reduction and absorptivity increase will gradually become a mandatory indicator in socio-economic development;
- To raise climate change awareness, responsibility and response capacity of stakeholders; to develop scientific and technological potential and human resource quality; to perfect institutions and policies, and develop and effectively use financial resources, contributing to enhancing the economic competitiveness and status of Vietnam; to take advantage of climate change opportunities for socio-economic development; to develop and widely multiply climate system-friendly ways of life and consumption patterns;
- To actively join international communities in responding to climate change; to increase Vietnam's international cooperation for effective climate change response.

Participating in the 21st Conference of Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) in Paris, Vietnam announced the Intended Nationally Determined Contributions report, which identified "*With domestic resources, GHG emissions will be reduced by 8% by 2030 compared to the Business as Usual scenario (BAU). The above-mentioned contribution could be increased up to 25% with international support*".

Besides, the Government of Vietnam approved National Strategy on Green Growth during 2011 – 2020, with vision to 2050. The objectives of this strategy are to develop a low-carbon economy, enrich the national capital and develop sustainable economy. These objectives will be achieved through fostering economic reform towards resource efficiency, GHG emission reduction by research and technology application, infrastructure development to improve economic effectiveness, climate change adaptation, contribution to poverty reduction and sustainable economic growth.

To promote SCP activities, in 2016, the Government issued National Action Plan on SCP up to 2020, with a vision to 2030. In this plan, consumption behaviour change is put forward through encouraging environmentally-friendly lifestyles, products and services via communication channels and knowledge transfer.

In May 2017, the Prime Minister of Vietnam issued National Action Plan on the implementation of Agenda 2030 for Sustainable Development with 17 goals (equivalent to 17 global goals) and 115 specific objectives, including Goal 12 – **Responsible Consumption and Production**.

I.3 Sustainable Consumption and Green Lifestyle

Due to the human consumption patterns, the Earth's natural resources have been exhausted, especially non-renewable resources. More than one third of the natural resources were exploited over the past four decades. Cities in the world used 75% of the natural resources, disposed of 50% of the waste and 60 – 80% of the GHG emissions [2]. It is predicted that until 2050, urban population accounts for two thirds of the world population. Consumption habits of individuals and the whole society in general have an enormous impact on the sustainability of human being.

1 UNFCCC, 2015
2 Report by UNEP, 2012

Sustainable Lifestyle is expressed in the way resources are consumed when acknowledging the limitation of the ecosystem and natural resources, and being aware of the responsibility of each individual to protect the Earth for today and tomorrow .

A "sustainable lifestyle" is a cluster of habits and patterns of behaviour embedded in a society and facilitated by institutions, norms and infrastructures that frame individual choice, in order to minimize the use of natural resources and generation of wastes, while supporting fairness and prosperity for all [3].

What is Low-carbon Sustainable Lifestyle?

"A "sustainable lifestyle" is a cluster of habits and patterns of behaviour embedded in a society and facilitated by institutions, norms and infrastructures that frame individual choice, in order to minimize the use of natural resources and generation of wastes, while supporting fairness and prosperity for all." (According to "A framework for shaping sustainable lifestyles" report by UN Environment).

BOX 2: FACTS AND FIGURES

1.3 BILLION OF FOOD equivalent to an estimated one third of all food produced that is worth around $1 trillion - ends up totting in the bins of cónusmers and retailers, or spoiling due to poor transportation and harvesting practices

120 BILLION USD will be saved annually by the world if people worldwide switch to energy effiencient lightbulbs

3 PLANETS as the equivalence could be required to provide the natural resources to sustain current lifestyles should the global population reach 9.6 billion by 2050.

WATER

_Less than 3 per cent of the world's water is fresh (drinkable), 2.5 per cent of which is frozen in the Antarctica, Arctic and glaciers. Humanity must therefore rely on 0.5 per cent for all of man's ecosystem's and fresh water needs.

_Man is polluting water faster than the natural capability of recycling and purifying water in rivers and lakes.

_More than 1 billion people still do not have access to fresh water.

_Excessive use of water contributes to the global water stress.

_ Water is free from nature but it requires expensive infrastructure to deliver to end-users.

ENERGY

_Despite technology advances have promoted energy efficiency gains, energy use in OECD countries will continue to grow another 35 per cent by 2020.

_Commercial and residential energy use is the second rapidly growing area of global energy use after transportation.

_In 2002, the motor vehicle stock in OECD countries was 550 million vehicles (75 per cent of which were personal cars). A 32 per cent increase in vehicle ownership is expected by 2020. At the same time, motor vehicle kilometres are projected to increase by 40 per cent and global air travel is projected to triple in the same period.

_Households consume 29 per cent of global energy and consequently contribute to 21 per cent of resultant CO_2 emissions.

_One-fifth of the world's final energy consumption in 2013 was from renewables

FOOD

_While substantial environmental impacts from food occur in the production phase (agriculture, food processing), households influence these impacts through their dietary choices and habits. This consequently affects the environment through food-related energy consumption and waste generation.

_1.3 billion tonnes of food is wasted every year while almost 1 billion people go undernourished and another 1 billion hungry.

_Overconsumption of food is detrimental to our health and the environment.

_2 billion people globally are overweight or obese

_Land degradation, declining soil fertility, unsustainable water use, overfishing and marine environment degradation are all lessening the ability of the natural resource base to supply food.

_The food sector accounts for around 30 per cent of the world's total energy consumption and accounts for around 22 per cent of total GHG emissions.

Source: http://www.un.org/sustainabledevelopment/sustainable-consumption-production/

3 Updated definition based on UNEP (2010), the Taskforce on Sustainable Lifestyle

I.4 Green Office and Green Office Lifestyle

What is Green Office (GO)?

Green Office is an environmental management system for offices, focusing on raising awareness and driving behaviours of office workers towards sustainable consumption practices. This is a continuous process to improve existing/emerging issues in order to reduce operating costs and environmental impacts of the organisations, resulting in benefits and healthy and friendly working environment.

In Vietnam, there were several Green Office programs such as Green Office Program by WWF Finland (2007), in which five offices of Vietnam were supported to achieve the Green Office WWF Certificates [4]. This program closed and no further support by WWF is available except sharing materials.

Besides, there are some certifications and lables for green buidling such as LEEDs certification (for buildings) and Green Lotus label (for hospitality); however, these are suitable for big companies because it requires invesment in reconstruction/renovations.

Consequently, at this moment, sustainable consumption programs should be developed with focus on offices and white-collar employment to promote a low-carbon lifestyle and contribute to the target of cutting GHG emissions established by the goverment.

What are benefits of Green Office?

Green Office (GO) focuses on behavioural change of individual employee and plays as a simple but effective model for individuals and organizations to participate in. Through the implementation of GO, each employee will be encouraged to do their responsibility for the common goal of community.

GO is an office that is clean and clear and friendly to environment and health of staff. The employees will be proud and close to the working environment, resulting in working effectiveness.

GO has a procedure of operations in order to control and reduce key domains of consumption in office, consequently, helps save operational costs.

Implementing GO contributes to corporate culture because the staff are aware of applying sustainable practices into daily works and caring about the enviroment and health.

GO is also a trendy approach for many organizations to make a difference in the eye of public audience with showing their efforts towards community, enhancing their reputation and corporate social responsibility.

Potential to cut GHG emissions with the implementation of Green Office

According to the lastest statistic of 2016, Vietnam has 2.8 million employees and the number of small-medium sized enterprises accounts for 98 percent of the total number, service industry is growing in recent years with aproximately 300,768 service providers.

Consequently, behaviour change of employees focusing on consumption of electricity, water, paper and creation of green working environment could contribute to the goal of GHG reduction of Vietnam.

Behaviour changes towards sustainable consumption amongst employees is considered as an effective and easy method with low financial investment to reduce consumption and emissions of organizations in comparison with other technical options with high costs.

According to "Exploring the potential contribution from behaviour change" (TRANSrisk, 2017), the amount of GHG savings is as below:

Table 1: Lifestyle profiles and Impact on GHG emission by behavior change

Lifestyle profile	Description	GHG emission savings
Enthusiastic	Behavioural options are applied as much as possible	16.2%
Conscious	Behaviour changes at average level	12%
Convinient	Behaviour change at low and passive level but still keep consumers convienient	5.9%

4 http://www.ngocentre.org.vn/content/wwf-grants-green-offce-certifcates-3-british-agencies-vietnam

Potential to cut GHG emissions on avarage as follows:

Table 2: Emission reduction potential

No.	Behavioural option for GHG reduction	Total GHG reduction in % from 2011 to 2050
1	Avoiding consumer food waste	2.4%
2	Public transport commuting	0.7%
3	Tele-working	0.3%
4	Urban cycling	0.6%
5	Car sharing/ Car club	1.1%
6	Avoid short flights	0.5%
7	Closer holidays	0.5%
8	Reduce home heating / cooling	0.6%
9	Organic waste recycling	1.1%
10	Paper waste recycling	0.6%
11	Plastic – metal – glass waste recycling	1.7%

I.5. Project "Upscale and Mainstream Green Office Lifestyles in Vietnam"

The project "Upscale and Mainstream Green Office Lifestyles in Vietnam" (GO project) with an innovative approach aims to promote and deploy GO in Vietnam through shift to sustainability-driven behaviours amongst office employees, formulation of office's sustainable consumption policy, policy dialogue on the promulgation of GO standard, and capacity building on GO for trainers and auditors.

Overall objectives: To upscale and mainstream Low-Carbon Sustainable Lifestyles patterns and behaviours amongst consumer groups of employees in offices, focusing on three key domains of consumption (energy, waste, water) in order to reduce impact on the environment and mitigate climate, consequently contributing to the implementation of the Master Action Plan of Vietnam's Green Growth Strategy, National road map to reduction of GHG emission and other related SCP strategies and action plans.

Figure 2. Logo of the project

Specific objectives: (1) To promote and implement Green Office Lifestyles for consumer groups of employees in 3 of most relevant areas (i.e. service providers, manufacturing and civil/public organizations) in Vietnam; (2) To develop the Green Office Lifestyles Toolkit and Green Office Standards as standardized materials for the use of public audience; (3) To contribute to the development of the policies in (i) GO certification; (ii) Sustainable Procurement; and (iii) Sustainable Consumption and Production; and (4) To contribute to Sustainable lifestyle training in Vietnam.

Based on methodology of project "GetGreen Vietnam"[5] and pilot implementation of GO at 11 participating offices in the project, this guideline has been revised and completed for public use.

I.6. Guideline on Green Office Criteria and Lifestyle

The guideline provides definitions, methods, step-by-step guidance to implement a Green Ofice program as well as criteria of green office. Users will know how to conduct GO program, from collecting data, establishing a team, training, applying practices to reporting GHG emissions. By reading thoroughly the guideline, organizations can do-it-yourself conduct a green office program with external or/and internal resources. Furthermore, an online database is provided for technical supports to implement GO programs.

The GO program presented in this guideline is suitable for all types and sizes of offices, from large business to SME enterprises, from public to private sectors, from administration, service providers to manufacturer); however, it is the most applicable for offices that meet requirements as follows:

- To have defined physical boundary (emission boundary), in detail, it can calculate the amount of consumed electricity, water, paper, office equipment and generated waste to conduct GHG reporting.
- To provide training on sustainable consumption and practices to the whole employees.

The guideline also can be refered by experts who desire to be GO trainers, GHG experts as a guidance on methodology and tools for training and assessment of GO program.

5 Project GetGreen Vietnam – Sustainable Living and Working in Vietnam was funded by SWITCH-Asia program, the European Union and implemented by the Delft University of Technology (the Netherlands), Vietnam Cleaner prodcution Centre and Asian Institute of Technology in Vietnam in the period from 2012 to 2015

II GREEN OFFICE AIT-VN CRITERIA

In order to quantify, calculate and manage GHG emissions, one of the most prestigious standards in the world is the GHG Protocol developed by the World Resources Institute (WRI) World Business for Sustainable Development (WBCSD). This standard has been widely adopted by companies, NGOs and governments worldwide as the international standard for the development and reporting of GHG emissions inventories. According to a list of Fortune 500 companies, by 2014, 86% of businesses used the GHG Protocol standard in their GHG emissions reports. The first version of the GHG emission assessment and reporting standard was issued in 2001. Along with other guidelines developed later, companies can evaluate and quantify emissions from energy consumption and other resources in their operations.

Based on the GHG protocol, the Green Office AIT-VN (GO AIT-VN) criteria have been developed and dedicated criteria for the offices' operation in Vietnam.

The GO AIT-VN criteria comprises of a guidance for organizations to report on GHG emission from office activities and GO management system.

i. The GHG emission report requirements include: identification of emission boundary, selection of base year, selection of reporting periods, selection of emission sources, calculation of GHG emission from emission sources.

ii. The GO management system includes: sustainable consumption policy, resources, training on behavior change for employees, emission reduction action plan, data collection and reporting system.

These are the two levels of GO certification: (1) Standard Green Office certificate and (2) Advance Green Office certificate.

II.1. GHG emission reporting

II.1.1. Emission boundary

Emission boundary in the criteria is defined as the physical boundary of the office of an organization or an enterprise not including the manufacturing department, where the organization/enterprise intends to apply GO AIT-VN criteria for the purposes of inventory and reporting of GHG.

II.1.2. Base year

Base year is a selected year in the past by the organization to compare GHG emissions data and determine the increase or decrease in GHG emissions for the operation of the office.

The organization shall establish a historical base year that can be representative for GHG emissions for the purpose of GHG emissions comparison or in accordance with other intended purpose. If sufficient information on GHG emissions is not available, the organization should consider the first GHG inventory period as the base year.

II.1.3. Reporting period

Reporting period is the period that organization applies the GO AIT-VN criteria for GHG inventory and reporting. The recommended duration for reporting period is 01 year that can reflect all activities of the organization.

II.1.4. Emission sources

Within the GO AIT-VN criteria, emission sources shall comprise of mandatory and recommended (optional) reporting sources.

Mandatory emission sources

Mandatory emission sources (which all offices might have) are:

- Emission from electricity consumption
- Emission from water consumption
- Emission from paper consumption
- Emission from consumption (purchasing) of other office equipment (appliances and furniture)

- Emission from generation of wastes
- Emission from business trips
    - o From transportation means
    - o From hotel accommodation

Recommended emission sources

Offices are recommended for monitoring and reporting the following emission sources:

- Emission from petroleum, diesel as fuel combustion
- Emission from LPG consumption (for kitchen, etc.)
- Emission from leakage of refrigerants
    - o During installation
    - o From annual operation
- Emission from employee commuting
- Others

II.1.5. GHG emission calculation

Direct measurement of GHG emissions based on gas concentration and air flow measurement is not feasible for enterprise-scale emissions calculations. Instead, emission factors are used as an alternative for mass balance calculation.

The emission factor of an emission source is defined as the amount of GHGs produced when consuming a certain unit of that emission source. In many cases, suppliers will have specific information about types of fuel they sell (for example coal suppliers for power plants will have the exact carbon component and calorific values for the coal they supply). However, in most cases, the enterprise will not have information on this specific emission factor so they need to use the default emission factor.

The default emission factor (or default factor) of a source of emission is the mean value calculated from the most common equivalent sources used by the Intergovernmental Panel on Climate (IPCC) or other prestigious organizations such as the GHG Protocol or the Department for Environment, Food & Rural Affairs (DEFRA). For example, in case of LPG gas as a source of emissions, measuring the actual amount of CO_2 emitted when burning the same amount of LPG gas from different mines results in variation of GHG emissions because of the different composition of the fuel across regions. For businesses, they will not be able to know exactly what their emissions are, so they can use the default value for gas emissions based on the IPCC study of average emissions from different sources.

In order to calculate the GHG emission, it is required to collect the activities data on consumption of emission sources and applying the emission factors, which represents a specific amount of GHG generated from consuming one unit of resources.

The common equation for calculating GHG emission is as below:

GHG Emission = Activity data* Emission factor (Equation 1)

The more detail and accurate of activity data, the more accurate of GHG emission estimation. For most of activities data, offices could collect the exact amount of consumption (such as electricity, office appliances, etc.).

Electricity consumption

Equation for calculating the emission from electricity consumption is presented as below:

$$Emission = \frac{C_{electricity} * EF_{grid}}{1000} \quad (Equation\ 2)$$

In which

Parameter	Explanation	Unit
$C_{electricity}$	Amount of electricity consumtion	kWh
EF_{grid}	Parameter Emission grid	tCO_{2e}/MWh

(Within the criteria, CO_{2e} is applied as unit for calculation and guidance because each of GHG has its own global warming potential.)

Grid emssion factor

Electricity grid for estimating the grid emission factor is the whole electricity generation system including the transmission and distribution lines and the existing grid-connected power plants. The methodology for calculating the emission factor is the "Tool to calculate the emission factor for an electricity system" which is developed by the United Nations Framework Convention on Climate Change (UNFCCC). Vietnam grid emission factor is published in Department of hydro-meteorology and climate change's website: www.noccop.org.vn.

Table 3: Vietnam grid emission factor

Parameter	Value	Unit
EF_{grid} [6]	0.8154	tCO_{2e}/MWh

6 The latest updated EF at time of releasing GO VN standard was 0.8154 tCO_2/MWh according to Documentary No. 315/KT-TVBĐKH-GSPT, dated March 17th 2017. Look up the most updated EF at the time of calculating the GHG emission.

Water consumption

Piped water consumption

Electricity is used in the water processing from treatment to pumping from water facility to end users. Therefore, consuming water also emits GHG. Equation for calculating the emission from water consumption is as below:

$$Emission = \frac{C_{water} * K_{water} * EF_{grid}}{1000} \quad (Equation\ 3)$$

In which

Parameter	Explanation	Unit
C_{water}	Amount of water consumttion	m^3
K_{water}	Amount of electricity consumption for water treatment	kWh/m^3
EF_{grid}	Grid emission factor	tCO_{2e}/MWh

Values of parameters in the above equation as follow:

Table 4: Emission factor of water consumption

Parameter	Value	Unit
K_{water} [7]	0.36	kWh/m^3
EF_{grid} [8]	0.8154	tCO_{2e}/MWh

Within the GO AIT-VN criteria, grid emission factor is the latest Vietnam grid emission factor.

Bottle water consumption

Equation for calculating the emission from bottle water consumption is as below:

$$Emission = \frac{C_{water} * EF_{bottle\ water}}{1000} \quad (Equation\ 4)$$

In which

Parameter	Explanation	Unit
C_{water}	Amount of water bottle consumption	littre
$EF_{bottle\ water}$	Emission factor of bottle water	tCO_{2e}/m^3

Values of parameters in the above equation as follow:

Table 5: Emission factor of water consumption

Parameter	Value	Unit
$EF_{bottle\ water}$ [9]	0.293544	tCO_{2e}/m^3

Paper consumption

Equation for calculating GHG emission from paper consumption as below:

$$Emission = \frac{C_{paper} * EF_{paper}}{1000} \quad (Equation\ 5)$$

In which

Hệ số	Explanation	Unit
C_{paper}	Amount of paper consumption	kg
EF_{paper} [10]	Emission factor of paper	tCO_{2e}/kg

Values of parameters in the above equation as follow:

Table 6: Emission factor of paper consumption

Parameter	Value	Unit
$EF_{printing\ paper}$	1.09	$kgCO_{2e}$/kg printing paper[11]
$EF_{toilet\ paper}$	0.93	$kgCO_{2e}$/kg toilet paper

7 Source: Ministry of construction: water and waste water database

8 Vietnam grid emission factor is published in Department of hydro-meteorology and climate change's website: www.noccop.org.vn. The latest updated EF at time of releasing GO AIT-VN criteria was 0.6612 tons CO_2/MWh according to the document number 605/KTTVBĐKH-GSPT, dated 19/05/2016. When calculating the emisison, office could look for the updated value.

9 Source: Table 3-5, page 186, "Life cycle assessment of drinking water systems: bottle water, tap water and Home/office delivery water".

10 Source: https://www3.epa.gov/warm/pdfs/Paper_Products.pdf

11 Office printing paper is also defined as paper from books, printing paper, note book other commercial publication, cardboard, paper bag or other wrapping paper.

Office appliances and furniture

Office appliances

Equation for calculating GHG emission from office appliances (OA) as below:

$$Emission = \sum \frac{N_{OA,x} * EF_{OA,x}}{1000} \quad (Equation\ 6)$$

Para	Explanation	Unit
$N_{OA,x}$	Amount of OA type x	Pieces
$EF_{OA,x}$	Emission factor of OA type x including	tCO_{2e}/1000 pieces
$EF_{ĐTDĐ}$	Emission factor of producing mobile phone	tCO_{2e}/1000 pieces
EF_{MTXT}	Emission factor of producing laptop	tCO_{2e}/1000 pieces
EF_{MTB}	Emission factor of producing tablet	tCO_{2e}/1000 pieces
$EF_{MTĐB}$	Emission factor of producing desktop	tCO_{2e}/1000 pieces
EF_{LCDMT}	Emission factor of producing LCD screen	tCO_{2e}/1000 pieces
EF_{LCDTV}	Emission factor of producing LCD/LED TV	tCO_{2e}/1000 pieces
$EF_{TBĐCN}$	Emission factor of producing multifuntional appliances	tCO_{2e}/1000 pieces
EF_{MI}	Emission factor of producing printer	tCO_{2e}/1000 pieces

Values of parameters in the above equation as follow:

Table 7: Emission factor of office appliances [12]

Parameter	Value	Unit
$EF_{ĐTDĐ}$	55	tCO_{2e}/1000 pieces
EF_{MTXT}	156	tCO_{2e}/1000 pieces
EF_{MTB}	162	tCO_{2e}/1000 pieces
$EF_{MTĐB}$	198	tCO_{2e}/1000 pieces
EF_{LCDMT}	326	tCO_{2e}/1000 pieces
EF_{LCDTV}	208	tCO_{2e}/1000 pieces
$EF_{TBĐCN}$	401	tCO_{2e}/1000 pieces
EF_{MI}	78	tCO_{2e}/1000 pieces

Office furniture

Equation for calculating GHG emission from office furniture (OF) as below:

$$Emission = \sum \frac{N_{OF,x} * EF_{OF,x}}{1000} \quad (Equation\ 7)$$

Para	Explanation	Unit
$N_{OF,x}$	Number of used furniture type x	Pieces
$EF_{OF,x}$	Emission factor of office furniture type x	tCO_{2e}/1000 pieces
EF_{B}	Emission factor of producing table	tCO_{2e}/1000 pieces
EF_{GG}	Emission factor of producing wooden chair	tCO_{2e}/1000 pieces
EF_{GX}	Emission factor of producing office chair with wheel	tCO_{2e}/1000 pieces
EF_{GK}	Emission factor of producing other chair	tCO_{2e}/1000 pieces
EF_{GC}	Emission factor of producing high storage	tCO_{2e}/1000 pieces
EF_{GT}	Emission factor of producing low storage	tCO_{2e}/1000 pieces
EF_{TTL}	Emission factor of producing filing cabinet	tCO_{2e}/1000 pieces

Values of parameters in the above equation as follow:

Table 8: Emission factor of office furniture [13]

Parameter	Value	Unit
EF_{B}	218	tCO_{2e}/1000 pieces
EF_{GG}	3	tCO_{2e}/1000 pieces
EF_{GX}	34	tCO_{2e}/1000 pieces
EF_{GK}	9	tCO_{2e}/1000 pieces
EF_{GC}	70	tCO_{2e}/1000 pieces
EF_{GT}	46	tCO_{2e}/1000 pieces
EF_{TTL}	23	tCO_{2e}/1000 pieces

12 Source: http://www.climatecalculator.net/en/office-appliances
13 Source: http://www.climatecalculator.net/en/office-appliances

Generation of wastes

Wastewater

Almost offices do not have their separated wastewater treatment for measuring emission from wastewater. Therefore, in order to simplify the calculation, the amount of wastewater is assumed as equal to the amount of consumed clean water from office. Equation for calculating GHG emission from waste water as below:

$$Emission = \frac{C_{water} * EF_{wastewater}}{1000} \quad (Equation\ 8)$$

In which

Parameter	Explanation	Unit
C_{water}	Amount of clean water consumption	m^3
$EF_{wastewater}$	Emission factor of wastewater	$kgCO_{2e}/m^3$

Values of parameters in the above equation as follow:

Table 9: Emission factor of wastewater [14]

Parameter	Value	Unit
$EF_{wastewater}$	0.71	$kgCO_{2e}/m^3$

Solid waste

Equation for calculating GHG emission from solid waste (SW) as below:

$$Emission = \sum \frac{Q_{SW,x} * EF_{SW,x}}{1000} \quad (Equation\ 9)$$

In which

Parameter	Explanation	Unit
$Q_{solid\ waste,\ x}$	Amount of solid waste type x	kg
$EF_{Solid\ waste,\ x}$	Emission factor of solid waste including	$kgCO_{2e}$/ton
$EF_{disposal\ paper,\ x}$	Emission factor of disposal paper	$kgCO_{2e}$/ton
$EF_{Cardboard,\ x}$	Emission factor of discharge cardboard	$kgCO_{2e}$/ton
$EF_{waste\ food,\ x}$	Emission factor of waste food	$kgCO_{2e}$/ton
$EF_{glass\ waste,\ x}$	Emission factor of glass waste	$kgCO_{2e}$/ton
$EF_{plastic\ waste,\ x}$	Emission factor of plastic waste	$kgCO_{2e}$/ton

14 Source: DEFRA, 2016

15 Source: DEFRA, 2016

Table 10: Emission factor of solid waste [15]

Parameter	Value	Unit
$EF_{disposal\ paper,\ x}$	314.00	$kgCO_{2e}$/ton
$EF_{cardboard,\ x}$	314.00	$kgCO_{2e}$/ton
$EF_{waste\ food,\ x}$	680.00	$kgCO_{2e}$/ton
$EF_{glass\ waste,\ x}$	25.78	$kgCO_{2e}$/ton
$EF_{plastic\ waste,\ x}$	34.08	$kgCO_{2e}$/ton

Note: For some offices, the monitoring of the solid waste amount for each type in the reporting period is impossible. Therefore, the GO AIT-VN criteria allow office to make sample of 5 working days (a week) of each quarter to estimate the amount of wastes for the whole period. Equation for estimating the amount of solid waste type x is presented as below:

$$Q_{solid\ waste,\ x} = Q_{total} * F_{solid\ waste,\ x} \quad (Equation\ 10)$$

In which

Parameter	Explanation	Unit
Q_{total}	Total amount of solid waste in the sampled days	Ton
$F_{solid\ waste,\ x}$	Fraction of solid waste type x	

Business trip (transportation and hotel accommodation)

Emission from transportation means (TM)

Equation for calculating GHG emission from transporation during business trip as below:

$$Emission = \sum \frac{KC_{CT,x} * EF_{transportation,\ x}}{1000} \quad (Equation\ 11)$$

In which

Para	Explanation	Unit
$KC_{CT, x}$	Travel distance with transportation means x	Km
$EF_{TM, x}$	Emission factor of transportation means type x including	$kgCO_{2e}$/km /person
EF_{OT}	Emission factor when travelling by car	$kgCO_{2e}$/km /person
EF_{TX}	Emission factor when travelling by taxi	$kgCO_{2e}$/km /person
EF_{TH}	Emission factor when travelling by train	$kgCO_{2e}$/km /person
EF_{MBPT}	Emission factor when travelling by economic class flight	$kgCO_{2e}$/km /person
EF_{MBTG}	Emission factor when travelling by business class flight	$kgCO_{2e}$/km /person
EF_{XB}	Emission factor when travelling by bus	$kgCO_{2e}$/km /person

Values of parameters in the above equation as follow:

Table 11: Emission factor of transportation means [16]

Parameter	Value	Unit
EF_{OT}	0.19184	$kgCO_{2e}$/km/person
EF_{TX}	0.16286	$kgCO_{2e}$/km/person
EF_{TH}	0.04885	$kgCO_{2e}$/km/person
EF_{MBPT}	0.13712	$kgCO_{2e}$/km/person
EF_{MBTG}	0.39764	$kgCO_{2e}$/km/person
EF_{XB}	0.10172	$kgCO_{2e}$/km/person

Emission from hotel accommodation

Equation for calculating GHG emission from hotel accommodation during business trip as below:

$$Emission = \frac{N_{night} * EF_{hotel}}{1000} \quad (Equation\ 12)$$

In which

Parameter	Explanation	Unit
N_{night}	Number of nights	Night
EF_{hotel}	Emission factor of hotel accommodation	

Values of parameters in the above equation as follow:

Table 12: Emission factor of hotel accommodation [17]

Parameter	Value	Unit
EF_{hotel}	15.13	$kgCO_{2e}$/night

Examples of GHG calculation are described in ***Appendix "D-1. Additional guidelines for GHG calculation"***.

Guideline for calculation of the recommended GHG emission sources is described in ***Appendix "D-2. Additional guidelines for GHG calculation"***.

II.1.6 Intensity emission

In the above calculations, the GHG emissions are calculated as the absolute amount of emissions generated by the office from the selected sources. Absolute emissions help the office identify and set certain reductions in GHG emissions in its emission reduction strategy, but it is not convenient to compare emission levels or their effectiveness between reporting year and base year.

Therefore, offices have to calculate and report the intensity of emissions to one or more specific units, including but not limited to:

- per service unit provided (e.g. number of tourists)
- per revenue unit
- per average number of staffs during the reporting period.

16 Source: DEFRA, 2016

17 Source: https://carbonfund.org/, calculated from source: Environmental Protection Agency, CHP Potential in the Hotel and Casino Market Sectors

II.2. Green Office management system

The Green Office management system is a part of an organization's environmental management system that is designed to manage and reduce GHG emissions from the organization's activities through changing consumer behavior and continuously innovative actions. Similar to other management system, GO management system includes policy, target, action plans, procedures for practicing, managing, auditing and reporting.

II.2.1. Sustainable consumption policy

Environmental policy on GHG emission reduction, or referred as environmental policy in the GO AIT-VN criteria, is an official statement by top management on the intent and general direction of the GHG reduction target of the office.

The office sustainable consumption policy shall:

- Be in accordance with the nature, size and impact of office's activities, products and services;
- Commit to continuous improvement and GHG emissions reduction;
- Have a specific goal of reducing resource consumption and GHG emissions from mandatory and recommended emission sources;
- Be documented, announced by the top management;
- Be communicated to all employees who are working full time or part time; and
- Be outreach to stakeholders (e.g. partners, suppliers, etc.).

II.2.2. Resources

The organization should have a management structure for the Green Office program, including the implementation team with the team leader, with specific responsibilities, authority, and scope of work. Staff in this team should have the appropriate management capacity.

The organization should specify the level of initial financial investment for improvement activities.

Resource arrangements should be documented and communicated to all staffs to facilitate efficient and effective management of the GO program.

II.2.3. Training on behavior change for employees

The organization have to provide training on awareness on GHG emission reduction at the office and green lifestyle for employees and record all documents and files relating to the training.

The organization have to provide training on awareness on GHG emission reduction at the office and green lifestyle for employees and record all documents and files relating to the training.

In addition, the office have to develop tools to implement green lifestyles such as instruction manuals, regulations or other stickers, posters or other guidelines. These tools should be available and accessible to all employees through communication channels.

II.2.4. GHG reduction activities

Direct actions

The office should plan and implement direct actions to reduce or prevent GHG emissions or enhance GHG removal for the implementing period (reporting period). Action plans and sustainable initiatives must address the current situation, improvement objectives (reduction of consumption and GHG emission), implementation methods, specific actions, time, human and necessary resources. The action plan must be approved by the top management of the organization.

Regulations, procedures for implementation or improvement must be promulgated, action initiatives should be periodically checked and recognized as a basis for evaluating as GO management system.

Carbon offset

If the office has plans to purchase carbon credits to offset the emissions from its operations, the office should report the amount, the original source of the credits that was or will be purchased.

II.2.5. Data collection system and regularly reporting

The organization shall establish forms and collect data as instructed in ***Part IV.1 Monitoring parameters and frequency***.

The organization must report on GHG emissions for the base year (baseline assessment report) and regular report (GHG monitoring report) according to the enclosed templates of this Guideline [18].

18 For report templates and document: bit.ly/TailieuVanphongXanh

II.3. Procedure of GO AIT-VN certification

II.3.1. Criteria of GO AIT-VN certification

GO AIT-VN certification comprises of two levels as follows:

Standard Level: to offices that meet a set of criteria on GO management system and GHG reporting of base year and reporting period, in detail:

- A commitment of top management to setup GO and issuance of sustainable consumption policy with specific targets of GHG reduction;
- Selection of base year, emission boundary, reporting period and sources of emissions according to the GO AIT-VN criteria;
- Proof of data collection method on monitoring parameters and frequency, precedure of information management, records of related documents and files for parameter of GO AIT-VN;
- Deployment of communications and practice guidelines for employees;
- Implementation of training on green lifestyles and reporting following the GO AIT-VN templates;
- Action plan for GHG reduction, periodical reports and action plan of the following year;
- Calculation of GHG emission of base year and reporting period following the guideline.

Advance Level: to offices that meet criteria of Standard Level and achieve at least of 6% GHG emission reduction according to GHG monitoring report in comparision to GHG emission report of base year for one of the following indicators:

- Total emission from mandatory sources of emission; or
- Emssion intensity of mandatory sources of mission

II.3.2. Procedure

Organization that want to be certified as Standard Green Office or Advance Green Office must filling the required application forms (including baseline assessment report, GHG emission report and excel calculation tool) [19] which provided by AIT-VN, then submit and wait for feedback.

AIT-VN will guide the implementation of the evaluation process including:

- Carry out an audit at the office, send an auditing checklist report requesting modifications or explanations (if any);
- Organize update and send feedback to the requested corrective actions in the auditing report;

AIT-VN checks consistency and complies with GO AIT-VN criteria to decide:

- Reject issuing GO certificate for office
- Issue Standard GO certificate
- Issue Advance GO certificate

19 Access: bit.ly/TailieuVanphongXanh

III GREEN OFFICE – IMPLEMENTATION GUIDELINE

III.1. Activity 1: Preparation

III.1.1. Organization's commitment

The success of a GO program fundamentally depends on organization's commitment and supports during the program implementation. Therefore, the prerequisite of GO program is commitment from top management of organization. In addition, the active involvement of lower management is also very important.

Commitment needs to be documented, signed by top management and published to all staffs, suppliers and investors (if any). Publication could be on the internal communication channels, even on organization's website.

The commitment of top management also confirms the arrangement of project's manpower from very beginning steps, supports for implementing phases and maintaining GO program.

Implementation process usually lasts for relatively long time with unexpected difficulties, therefore, remaining implementation motivation is also a challenge. It is vital that the top management stays committed and supporting in order to ensure the GO program run smoothly as well as sustain staff's participation. It also helps lower the risk of distraction caused by other higher priority activities of the organization.

Commitment could be revised yearly basing on organization development strategy.

III.1.2. Establish the GO team

Implementing GO requires building a GO team who are responsible for the whole program. GO team's members could be employees of different departments and need not to work relating to environment issues. These members should have experience in organizational activities, be willing to learn and commit to continuous improvement. The GO team members need to be empowered as well as approved to adjust their workload to implement GO activities.

There should be a clear announcement and official document on structure of GO team, information about members' roles, responsibility with approval of the top management. Number of GO team members depends on the size of office and is decided by GO program coordinator.

The organization should find a qualified employee to take over the position of Green Office Coordinator. The qualification of GO coordinator may include: experience in organizational activities, knowledge of environment issues, problem-solving skills, ability to motivate others and good at team-work.

The GO team should identify a trainer to facilitate behavior change training to staffs. The trainer, who could be internal or external, is required to have experience in training and facilitation, master the methodology of behavior change, be able to inspire others and have good knowledge about environment. The GO team also need to identify an expert (internal or external) who could consult them in emission report and improvement solutions during the implementation of GO program.

The organization may invite external expert who could play roles of both trainer and emission expert.

III.2. Activity 2: Baseline assessment

III.2.1. Identification and calculation of emissions

The first step is to define assessment factors according to the GO AIT-VN criteria including: Emission boundary, Base year, Reporting period and Emission sources.

The next step is to calculate emission from actual consumption data, sources of emission.

For detail, refer to ***Part II: "Green Office AIT-VN Criteria" and Part IV: "Monitoring and Report Guideline"***.

III.2.2. Walk-through assessment

Walk-through to observe and evaluate all departments of the organization to:

- Have general understanding about office layout and installed systems
- Find out several existing wastes

Note: GO team can split up to conduct walk-through assessment.

Refer to ***Appendix B-4: Walk-through assessment***

III.2.3. Technical assessment

If there is any difference or doubt between statistical consumption data and walk-through assessment, GO team could consider to ask technical experts (emission experts) to re-evaluate. Experts may indicate:

- Opportunity to improve operating process and maintenance;
- Opportunity to replace types of energy/materials, potential to reuse and recycle

III.2.4. Consumption assessment, GHG emission report and Baseline assessment report

All assessments and collected information are summarized in Baseline Assessment Report.

*Refer to **Part IV. Monitoring and Report Guideline"**.*

GO coordinator is responsible for assigning GO team members to do assessment tasks and report. Assessment and Reporting works require participation of Emission expert to ensure their accuracy and compliance to the GO AIT-VN criteria and possible to compare to next phase/ final assessment report.

The Baseline assessment report needs to be sent to management and public to staffs.

III.3 Activity 3: Establishing sustainable lifestyle at the office

Office workers are subject to consumption activities in an office, therefore, they are key factors to make sustainability-driven changes in consumption pattern of their organization to save expenses and reduce environment impacts that are caused by their daily consumption in the office such as electricity, water, stationary... Also, they play a very important role in sustaining these changes in the organization. It means that changing their behaviors toward sustainable consumption is establishing sustainable lifestyle at the office.

The success of establishing sustainable lifestyle, green lifestyle at the office depends on the participation level of staff. They will be willing to contribute sustainable ideas and ready to change their behaviors if they well understand the objective of environment protection activities and realize the benefits for their organization and themselves.

Communication is vital to ensure that all the staff understand the objectives and roles of individuals in implementation and maintaining sustainability-driven activities (green activities). Every staff needs to be communicated and participatory in green living lifestyle activities facilitated by the GO team.

III.3.1. Communications

All staff in the organization should be communicated about GO program from the beginning, including part-time, short-term, remote workers.

Communication activities may use internal channels such as GO bulletin, panel, monitors at public areas (canteen, meeting room, rest room, working table...); online internal channels like website, facebook or at meetings, outdoor and team building activities...

Communication activities include:

- Announce top management commitment to GO implementation project. Commitment document should be framed and show at official area;
- Use visual communication tools (infographic, video clips...) that deliver information about pollution issues and benefits of sustainable consumption and green living lifestyle;
- Sticky notes with nice visualization for green behaviors at easy-to-see positions;
- Often update GO program's activities through bulletins. Periodically update the GO implementation results in forms of charts of key consumption indicators (encourage to convert into emission data or amount of money saved) ;
- Always remember to praise, reward to staffs or units who gain good results and initiate improvement activities;
- Provide contact points or channels for feedbacks and improvement ideas from the staffs;
- Communicate to customers, suppliers, partners about GP program and its results;
- Communication materials should have attractive designs that are easy to understand, friendly and inspirational.

Specific GO team members should be assigned to the communication work.

Figure 3. Green Office bulletin

Figure 4: Pixelz's interal e-newsletters

LESSONS LEARNT

Offices are encouraged to design internal communication in creative way that suitable to their nature of work and culture such as:

Insee Vietnam used electronic monitor at lobbies and public areas to present GO instructions to staffs because of a large number of employees.

Representative office of University of Arizona Office, USA in Vietnam created video clip about practice guideline to set as computer screen saver for all staffs because they often work independently with less interaction.

Pixelz used Facebook as internal communication channel that is very friendly and effective way because their staffs are young, active and doing creative works.

Red river delta regional hydro - meteorological center applied "waving technique" at the very beginning stage, by re-arranging office layout to utilize natural light, add more plants (bonsai)... This impressed staffs and motivate them to the next GO activities.

III.3.2. Establishing sustainable lifestyle amongst staffs

III.3.2.1 Develop Practice Guideline for staff

This can be a guidebook whose content may include:

- Commitment and environment policy of the office signed by top management;
- Instruction and guideline for practice: procurement, operation, consumption of office equipment, material, disposing wastes, organizing activities indoor and outdoor such as events, meetings, business travelling, retreating trips, community activities...

Refer to ***Appendix A - Practice Guideline***.

Current relating processes and regulations or issue practice guideline to support the shift to green lifestyle in using lights, air conditioners, printers, bottled drinking water...

The guidebook should have simple design with pictures, easy to understand, easy to practice, attractive, inspiring and easy to keep at working desks.

Figure 5. GetGreen Guidebook developed by GetGreen Vietnam project. (Source: Vietnamplus)

The guidebook can be published in online version that does not require printing work, possible to put on the computer screen, TV, electronic panels...

Be reminded to apply sustainable tips while designing, printing the guidebook design, and deciding the number of documents to be issued.

Practice Guideline for staff is drafted by GO team before lifestyle training and implementation. This document will be revised by adding valuable ideas from staffs in training activities (Activity 3) and finalized when sustainable policy is established (Activity 6).

20 http://getgreen.vn/tai-lieu

III.3.2.2 Sustainable lifestyle training

It is essential for all staff of the organization to participate in sustainable lifestyle training and be reminded frequently. The training should be integrated into orientations and training for new staff.

Objectives

- To inspire staff to change lifestyle toward sustainability and maintain green behaviors.
- To encourage bottom-up initiatives that are suitable to the organization's culture and specific works
- To conduct the training activities and team working for developing GO action plan

Key contents

- Understand lifecycle of products/goods and environmental impacts of consumption as well as consumers;
- Understand benefits of GO implementation, introduction GO models ;
- Give inspiration on environment protection and sustainable consumption
- Implement sustainable consumption initiatives, share lessons learnt and experiences
- Inform the current consumption data of the office
- Initiate improvement ideas and practices, focus on main consumptions of office

Training methodology

- Training is organized in small groups of 20-25 people or by department.
- Training applies 5 steps of Behavior Change Model (***Appendix C-1***) and sustainable behavior change methodology of GetGreen Vietnam project [20].
- Training can be held in/out of office or outdoor depending on the purpose of training session.
- Trainer should understand fully training methodology to ensure the effectiveness of training

LESSON LEARNT

Outdoor training on green lifestyle often bring good results. In an open and friendly space, it supports sharing, collaboration and open conversations. This is also a good chance to remove barriers of actions to form a new behavior.

Before training, trainer needs to evaluate and analyze current consumption behavior of office staff. Trainer may use model MOA (Refer to ***Appendix C-2: Cấu trúc chương trình tập huấn thay đổi hành vi***) to understand the Motivations, Abilities, Opportunities that lead to current behaviors of office staff. This work could be conducted by interviewing, questionnaire and observation and to all office staffs.

Evaluation results need to report (see Report Form in-***Appendix C-5: Báo cáo tập huấn thay đổi hành vi***, use only items 1,2,3)

Find Interviewing and questionnaires form in ***Appendix B-1 : Mẫu câu hỏi phỏng vấn nhận thức và hành vi của nhân viên***

Time

Training methodology consists of 6 sessions (training topics will be selected by GO team basing on Evaluation results). Training duration should be in 2 months. Time between training consecutive sessions could be one or two weeks depending on agreement between trainer and GO team. Office consider number of training sessions basing on their own condition (but should not less than 4 sessions).

Organization can integrate sustainable consumption in other activities of office to support staffs' behavior change.

Organization should select appropriate time for training. Training should not be organized at organization's busy time to ensure the continuous of training and staff's attendance. Training activities could be designed as out of office time activities.

LESSON LEARNT

Cát Vạn Lợi considered GO training as a capacity building for employees. The company combined trainings with quarterly learning schedules. All employees participated in the training with high spirit, resulting in significant changes in awareness and behviors.

Training topics

Training topics are selected in the following ones: Energy saving, Resource Saving (water, stationaries, papers...), 3R (Reduce, Reuse, Recycle) and Wastes.

Use "Office Sustainable consumption report" and "current consumption behavior evaluation report" at training preparation step to consider and select training topics.

It is possible to separate or combine topics in one training session with the consideration of trainer and GO team.

Collect staff's initiatives for action plan

Initiatives proposed by staffs in the training sessions should be collected and considered to be included in action plan generated by GO team. Trainer should design training activities with practices that possible to apply immediately (short-term initiatives) as well as create the opportunities for staffs to generate middle and long-term initiatives for each training topic.

Draft of action plan is collection of staff's initiatives of all topics is expected at the end of training activities. GO team will base on this draft of action plan to generate the GO implementation plan.

Behavior change evaluation after training

To evaluate the level of staff's behavior change and training effectiveness, the following tasks need to be deployed:

- Survey form
- Interview staff and group of staff
- Observe daily behavior of staff
- Collect consumption data such as electricity, water, papers...as indirect results ...

This evaluation results are compared to before-training evaluation and include in training report. Refer to ***Appendix C-5: Behavior Change Report***.

Training tools

- Lessons plan (***Appendix C-3: Sample of Training Lesson Plan***)
- Presentation about GO project (GO database [21])
- Reference library by topics (GO database)

21 bit.ly/TailieuVanphongXanh

- Games use for training activities and sustainable (GO database)
- Situational guide for trainers (***Appendix C-4: Situational guide for trainers***)
- Practice Guideline (select to use) Refer to ***Appendix A: Practice Guideline***.

Solution for big office with many staffs

- GO team need to divide training activities into different batches (20-30 staffs/batch). The total time for training should not last more than 3 months because the staff trained in the first training batch may lose motives for actions if there is a long break between training and implementation.
- GO team can design flexible training schedule, combine relevant activities of different batches to save time. For example: organize combined training for all batches at the same time for introduction/ field visit/summary sessions
- If it is impossible to organize training for all the staff, trainers should consider to build a pool of change agents in every units. These change agents will be assigned to extend the training to their colleagues in the same units. At the same time, the office must put more attention to internal communication activities or use regulations that request staffs to follow. In this case, internal communication work should use different and more intensive communication way in longer time than offices that could do training for all staffs.

LESSON LEARNT

Inspiration plays a very important role to achieve the objective of awareness enhancing and behavior change for office staffs. Calling the attention, awaking the love and responsibility with living environment will be effective start to encourage the participations actively. Self-motivation of individual is foundation for creativity and expansion to others staffs in the office, better than regulations.

Many staffs state that the factor that motivates them is not only to save or reputation of the organization but also their good feeling is more important, when they have chance to join hand in meaningful activities for environment and community.

Therefore, the trainer should apply inspiring methods in his/her training.

III.4. Activity 4: Sustainable Initiatives implementation

GO team finalize detail implementation plan including specific targets for each domains of consumption, solutions, requirement of investment, human resource, time... based on baseline assessment and proposed implementation plan at the end of training on behavior change.

Sustainable initiatives implementation is the responsibility of GO team with support of Emission Expert (if have)

III.4.1 Setting specific targets for mandatory and recommended sources of emissions

- Mandatory sources of emissions: Electricity, Water, Office equipment, Paper (printing/carton papers/tissues), Waste, Business trip (travelling and hotel stay).

- Recommended sources of emissions: Gasoline / Diesel, Gas LPC for kitchen, Staff's travelling to work place, Emission caused by refrigerant.

Setting targets by using SMART principle:

- Specific
- Measurable
- Achievable
- Relevant
- Time-bound

III.4.2 Finalize implementation plan

In the action plan, improvement actions and solutions should be categorized into three types that are short-term, medium-term and long-term actions.

The first part in the action plan is usually about communication works, issuance of procedures, regulations and training on behavior change. These activities often give indirect results that are not easy to measure but their efficiency could be seen in a short time, 1-3 months (for example: turn off the light and computer monitor when not in use and at lunch time, set air-conditioner at 26 degree C and turn it off 30 minutes before leaving at the end of working day.

Consider improvement initiatives that possibly bring significant savings but do not require big investment (relating to equipment replacement, operation and of-

fice layout) as medium and long-term actions (for example: gradually replace lighting with LED, install curtains, shading to prevent direct sun light...)

Initiatives that relate to operation:

- Management/ adjustment of energy use;
- Solutions to improve energy efficiency
- Process improvement
- Management of transportation and travelling methods
- Convert to alternative energy/fuels

Refer to ***Appendix B: GO Management System - Implementation Tools*** .

The action plan should consider:

- Identify actions and activities clearly for every staff and unit;
- Consider related factors such as the possibility, expense requirements, preferable time; human resources;
- Identify indicators and expected results to monitor and track emission reduction;
- Get advice from experts for the potential actions that lead to reduce carbon emission
- Review and document all internal practice procedure to support action plan. Prepare and issue new procedures in case that they are not available for staffs (example: lighting use guideline, air-conditional use guideline, printing paper, toilet paper, drinking water, tap water, car use guideline...), and functional units (example: equipment unit is responsible for air-conditional preventive maintenance, lighting box cleaning, water system checking...; procurement unit is responsible for stationary purchasing procedure...)
- Assign human resource for each action. Should assign 1 or 2 consumption types/areas for each member of GO team (consumption type should be similar to the member in charge). This enables them to monitor the level of change and results/ improvements (example: assign electrical saving activities to staff who responsible for office equipment).
- Define implementation timeframe. If an activity requires longer time of implementation, consider to plan it by stages and specific timeline.
- Action plan shall be approved by the top management, which facilitates a smooth process in GO team.;

Note: besides initiatives on saving and reducing GHG, offices should consider initiatives on improving woking environment, ensuring health of employees as well as quality of lighting, air, noise reduction, moisture level...

Refer to ***Appendix B-5: Sample of Regulations***
Refer to ***Appendix B-7: Sample of Sustainable initiative action plan*** and ***Appendix B-8: Sample of action plan***

III.4.3 Sustainable Initiatives implementation

The implementation period should start immediately after the training on behavior change to maintain and utilize momentum for actions created within the training. The break time between training (activity 3) and implementation (activity 4) should not be longer than 2 weeks, in which GO team also have enough time to finalize the action plan.

GO team members, who are in charge of assigned area or consumption types, will lead, support and follow up the action plan. Some of activities may require financial support for tools, equipment, materials...

Every month, GO team need to organize meeting to update progress to ensure the implementation time and quality. The implementation period often lasts for months and may have risk of delaying because of other higher priorities of the organization. .

It's necessary to publish implementation activities, new regulations/instructions on GO communication channels to draw attention from all staffs, create motivation and crowd effect to support the next implementation activities.

There should be rewards for teams or staffs who get good improvement. Refer to ***Appendix B-3: Rewarding Policy.***

III.5. Activity 5: Implementation evaluation

Implementation evaluation subjects to check the progress and effectiveness of implementation plan.

During implementation, every three months, GO team needs to do evaluation and report the results.

Through evaluation work, GO team will find the level of achievement compared to the initial targets, relevance of the processes, participation level of staff, challenges, improvements or any points that needs supporting.

Data/Information could be collected consecutively or periodically (daily, weekly, monthly, quarterly) depending on the types of consumption (see Information collection system and periodically report).

GO team coordinator is in charge of conducting evaluation works and report.

Implementation Evaluation Report should have additional information such as:

- Change in awareness and behavior of staff: interview staff or group of staff. If the change is still at low level, consider to have additional training and/or more intensive communications;
- Report of consumption data (using Excel tool to calculate emissions for the purpose of GHG monitoring report) ;
- Level of achieving objectives: with analysis of drives/barriers, strong/weak points, improvement solution;
- Recommendation for improvement and supports.

Implementation Evaluation Report needs to be sent to the top management and communicated to staff through internal communication channels.

When Implementation Evaluation results show that GO system is in place and being operated effectively, objectives are achieved, GO team could plan to do final review GO management system: policy, operating processes, monitoring process, emission reports, continuous improvement... to register GO AIT-VN certification.

III.6. Activity 6: Establish sustainable consumption policy and standardize GO management system

III.6.1 Revise and issue sustainable consumption policy that aligns to organization's development

Based on Implementation Evaluation report, consider to revise sustainable consumption policy and objectives and announce internally to staff and publicly to partners, customers, investors...

III.6.2. Develop action plan of the following year

Build an action plan for the next year including objectives and implementation plan approved by the top management.

Communicate action plan to all staff.

Propose corporate social responsibility activities following the principles of GO to community, partners, supply chains…

III.6.3 Standardize the instructions, processes and documents to sustain the system

- Finalize the practice guide and instructions for staff and functional units;
- Finalize the regulations and processes;
- Adjust and standardize checking, evaluation, report, rewarding process;
- Revise communication documents that serve for revised policy and objectives.

These above contents need combining in a document named "***Sustainable consumption policy***".

Refer to ***Appendix B-6: Sample of Sustainable Consumption Policy***

III.6.4 Conduct GHG Emission Report

Conduct GHG Emission Report refer to ***Part II GO AIT-VN Criteria***. This activity is implemented by GO team with support of Emission expert (if any).

Organizations that complete deployment of activity 1 - 6 are eligible to apply for GO AIT-VN Certification.

GO IMPLEMENTATION PROCESS

IV MONITORING AND REPORTING GUIDELINE

IV.1. Monitoring parameters and frequency

Emission from electricity consumption

No.		Monitoring indicator 1
Indicator		$C_{electricity}$
Unit		kWh
Description		Electricity consumption
Data source		Accounting department
Monitoring procedure	Method	Aggregate data from invoices
	Frequency	Monthly
Other information (if any)		

Emission from water consumption

No.		Monitoring indicator 2
Indicator		C_{water}
Unit		m^3
Description		Water consumption
Data source		Accounting department
Monitoring procedure	Method	Aggregate data from invoices
	Frequency	Monthly
Other information (if any)		

Emission from paper consumption

Printing paper

No.		Monitoring indicator 3
Indicator		$C_{printing\ paper}$
Unit		kg
Description		Printing paper consumption
Data source		Accounting department
Monitoring procedure	Method	Aggregate from invoices
	Frequency	Monthly
Other information (if any)		

Toilet paper

No.		Monitoring indicator 4
Indicator		$C_{toilet\ paper}$
Unit		kg
Description		Toilet paper consumption
Data source		Accounting department
Monitoring procedure	Method	Aggregate from invoices
	Frequency	Monthly
Other information (if any)		

Emission from office applicances

No.		Monitoring indicator 5
Indicator		$N_{office\ appliance,\ x}$
Unit		Piece
Description		Number of office appliance type x Cellular phone Laptop Tablet Desktop LCD screen LCD/LED TV Multifunction device Printer
Data source		Accounting department
Monitoring procedure	Method	Aggregate from invoices
	Frequency	Monthly
Other information (if any)		

Emission from office furniture

No.		Monitoring indicator 6
Indicator		$N_{office\ furniture,\ x}$
Unit		Piece
Description		Number of office furniture type x Desk Wooden chair Chair with wheels Other chair High rack Low rack Document cabinet
Data source		Accounting deparment
Monitoring procedure	Method	Aggregate from invoices
	Frequency	Monthly
Other information (if any)		

Emission from solid waste

No.		Monitoring indicator 7
Indicator		$Q_{solid\ waste,\ x}$
Unit		kg
Description		Amount of office solid waste type x Disposal printing paper Discharged cardboard Food waste Glass waste Plastic waste
Date source		All departments
Monitoring procedure	Method	Report from departments
	Frequency	Quarterly
Other information (if any)		For some offices, it's impossible to monitor allt ypes of solid wwaste during reporting period. Therfore, the criteria allow offices to take sample of 5 working days randomly to estimate the total amount of solid waste of a quarter.

Emission from business trips

Means of transportation

No.		Monitoring indicator 8
Indicator		$KC_{business,\ x}$
Unit		Km
Description		Travel distance by means of x Car Taxi Train Economy class flight Business class flight
Data source		Account department
Monitoring procedure	Method	Aggregate from invoices
	Frequency	Monthly
Thông tin khác (nếu có)		

Hotel accommodation

No.		Monitoring indicator 9
Indicator		N_{night}
Unit		Night
Description		Number of nights staying at the hotel
Data source		Accounting department
Monitoring procedure	Method	Aggregate from invoices
	Frequency	Monthly
Other information (if any)		

IV.2. Reporting principle

The calculation of GHG emissions and reporting are based on the following principles [22]:

- **Relevance**: Ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision-making needs of users – both internal and external to the company.
- **Completeness:** Account for and report on all GHG emission sources and activities within the inventory boundary. Disclose and justify any specific exclusions.
- **Consistency:** Use consistent methodologies to allow for meaningful performance tracking of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.
- **Transparency:** Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
- **Accuracy:** Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable.

IV.3. GHG report requirement

GHG emissions report should be made annually for the office. The goal of the GHG emissions report is to help offices quantify their impact on climate change as well as identify opportunities to reduce GHG emissions. The GHG emissions report should include the following steps:

- ***Step 1: General description of the office and the person responsible for the report***
- ***Step 2: Defining boundary:*** Offices must establish and document their operational boundaries. Establishment of operational boundaries involves identifying emissions along with the offices' activities, classifying emissions into mandatory or optional reporting emission sources. This includes choosing which type of optional emission will be quantified and reported. The organization must explain the changes, if any, to its operational boundaries.

Example: *Company X has two offices, Hanoi office and Ho Chi Minh office. However, Company X chooses Hanoi office to apply GOVN criteria. So, the boundary of emission will be the entire Hanoi office of Company X.*

- ***Step 3: Select and set up base year***
  - The office shall establish a historical base year, representative for GHG emissions for comparative purposes or in accordance with other intended purpose.
  - If sufficient information on GHG emissions is not available, the office may use the first GHG inventory period as the base year.
  - The office may change its base year, but must explain the change to this base year.

Example: *Office X starts implementing an environmental policy on reducing greenhouse gas emissions from 2014 and selecting 2013 as the base year to compare greenhouse gas emissions because year 2013 was the year when X began to operate steadily and information for calculating greenhouse gas emissions could be collected.*

- ***Step 4: Define reporting period and reporting frequency***

Example: *Office X selects the reporting period from the first day of the year to the last day of the year so the annual greenhouse gas emissions report of X will include greenhouse gas emissions from January 1 to December 31 of the reporting year.*

- ***Step 5: Identify emission sources***

Example: *Besides the mandatory emission sources, Office X has chosen the following emission sources for reporting:*

• Emission from direct fossil fuel consumption: Amount of LPG consumption

• Emission from cooling equipment: number of fridges

• Emission from Air conditioner: number of AC

• Emission from server: number of servers

22 Source: GHG Protocol

- ***Step 6: Data collection: Collect inputs data for emissions calculation.***
- ***Step 7: Describe the process of managing information, storing documents and records***
- ***Step 8: Calculation:*** Quantify the amount of GHG emissions generated by the office using the collected data. (Refer to ***Appendix D: Hướng dẫn bổ sung tính toán phát thải khí nhà kính***)
- ***Step 9: Analysis:*** Compare the emissions of the current reporting period with previous reporting periods or against the base year.
- ***Step 10: Recommendation: propose action to reduce emissions***
- ***Step 11: Announce that the GHG report has been prepared in accordance with the criteria;***
- ***Step 12: State whether the GHG inventory, reporting or verification has been verified, including the type of verification and the level of assurance achieved.***

A sample report on GHG emissions is given in the annex to this Guideline [23].

23 Access to bit.ly/TailieuVanphongXanh

APPENDIX
A - GO PRACTICE GUIDELINE

1. Energy

Energy saving benefits economically and environmentally. Energy saving reduces operating costs, reduce carbon emissions that contributing to global climate change.

1.1 Lighting

- Use energy saving bulbs (compact fluorescent T5 and LED)
- Turn off the lightings when and where that not in use
- Use table lamp instead of ceiling bulbs in the area that less people and appropriate
- Utilize natural light wherever possible
- Frequently clean bulbs and the lighting fixture.
- Use separate switches for each light or group of lights
- Label light switches to denote location of lights, aiding in switching off unnecessary lighting
- Install switch occupancy sensors to automatically turn lighting off when no one is present
- Install timers on outside lighting, update timer seasonally

1.2 Cooling/Heating conditioner

- Set the temperature at 24-26 degree C in the summer and 18-20 degree C in the winter. When outside temperatures is 20-24 degree C, turn off heating or cooling if.
- Check if doors and windows have tight seals to prevent air loss.
- Consider open the window on nice days (if not noisy)
- Use zoning system to on/off control to only required area if using central air system
- Make sure that the air outlet (vent) is clear to ensure free airflow
- Use fans instead whenever possible. Fans will help to circulate the air, reducing the need for air conditioning while remaining comfortable
- Perform pre-seasonal and periodical maintain air conditioners to make sure that they run with lowest cost and provides good performance
- For big air conditioner equipment, it may be worthwhile to have professionally audited for
- energy usage and efficiency
- When purchasing a new system, make sure it is the most energy efficient model
- Consider to evaluate old air conditioners, it may be more cost effective to install new
- When purchase new air conditioner, should select the appropriate size for your space and use requirements.

1.3 Office envelope

- It's important to consider envelop office building solutions such as insulation panels, walls, roofs, aisle, green cover because they will help to save energy for the building
- Consider to install solar energy system on the roof of the office
- Use insulate, multiple layers door and window
- Install window glazing, films or tinting to reflect and reduce the sun light and heat
- For new design / re-new office, positioning building and doors, windows to take advantage / reduce disadvantage of sun's light and heating as well as add more shade.

1.4 Office Equipment

- Turn off equipment at the end of working day or when not in use
- Unplug the equipment because they still consume small amount of energy when it's turned off an unplug.
- Select to use equipment (printer, photocopy, fax...) with power save mode and energy saving label
- Consider location of printers, photocopy, fax... because they produce heat. Consider to place in private room or far away from air-conditioner sensor
- Setting application for computer or monitor to automatically turn off when not in use or at the end of working day
- Turn off when not in use or at the end of working day (computer monitor uses up 75% energy powering a computer)

- Consider to use LCD for computer or laptop to save energy
- Consider to use printers with ink/tonner saving mode
- Plan printing works in batch because it's extra energy consumption once they are re-started.
- Consider updating technology equipment like server, select appropriate size with consideration of short-term and long-term needs. Select equipment that integrated multiple functions instead of buying multiple pieces of equipment.

1.5 Pantry room

- Consider to use cleaning machine, sanitizing machine when it's full batch and should use saving energy mode
- Always check coffee machine, boiling machine if there is not needs of keeping warm/hot
- Select right size fridge
- Replace microwave oven if it has been used over 5 years
- Use microwave instead of baking oven
- Locate the fridge away 15cm from the wall
- Frequent check the close of fridge door (try to insert a paper to check the gap at rubber line of fridge door)

1.6 Transportation

- Encourage and issue the policy to support staff to use public transportation
- Consider to buy hybrid cars
- Always check the pressure of tires to optimize the energy efficiency
- Periodically maintenance the means of transportation
- Always use GPS to find the shortest travelling way
- Consider to use tele-communication for meeting instead of travelling
- Encourage and arrange to combine transportation needs of office staff
- Consider working at home option

2 Water usage

2.1 Bathroom

- Use the shower tap with flow rate around 9 L/minute. Should not use the tap with flow rate higher than 13 L/minute
- In case that need higher water pressure, consider to install additional available kit to increase the pressure
- Stickers to remind water saving at water usage points

2.2 Restroom

- Use dual flush toilet
- Keep controlling water leaking of water flush tank, fix it immediately
- Consider water amount of water tank, adjust if it's too much. Anyway, should not adjust to reduce more than 2L (the tank may be designed with more water)
- Consider water tank at urinals not more than 7L or less
- Frequent check equipment sensor to prevent non-stop water running
- Stickers to remind water saving at water usage points

2.3 Hand wash basins

- Use tap with flow rate less than 6 L/minute and with aerated flow function. Should not use the tap with flow rate more than 10 L/minute
- Taps with on-off sensor, select one that switch off within 6 seconds. Anyway, the tap with sensor often waste water more than normal one
- If there is hot water function, select reasonable hot level
- Stickers to remind water saving at water usage points

2.4 Kitchen

- Use water saving taps and equipment
- Only run disk cleaning machines once it's full
- Stickers to remind water saving at water usage points and fix if there is leaking
- Turn-off hot water machine when not in use

2.5 Cooling tower

- Periodically check water piping, overflow valve of cooling water to make sure that it works well and do not waste water

2.6 Utilize rainwater and grey-water

- Encourage to use rainwater and grey water (used water) to water the plants and garden
- Water the garden early in the morning or late in the afternoon time to reduce evaporation
- Design to harvest rainwater from the roofs to water the garden and cleaning
- For new building, consider design solution to collect and recycle water from hand wash basins and bathrooms

3 Paper saving

3.1 Printing paper saving

- Always think before any printing, ask if it's necessary
- Use double sides printing mode (set at computer and use printer with this function)
- Consider to use N-up printing mode (multiple pages in single paper page)
- Create template with smaller font, left and right margin, header and footer
- Use electronic mail or online applications to share information instead of printing
- Request suppliers to send information through email instead of printing mail
- Provide softcopy of invoices to customers
- Always update mailing address and recheck if sending mail is necessary.
- Design mailing letter paper so that there is not requirement of an envelope to send with
- Stickers to remind saving paper at printer or working table

3.2 Saving toilet paper and tissue pap

- Control usage of tissue paper for face and hand cleaning (practice example at cleaning basin: wave your hand to reduce water before getting paper, use only one tissue paper sheet to dry your face first and then your hand)
- Use cloth instead of paper to dry hand
- Limit using tissue paper for other cleaning purposes such as cleaning table, furniture…
- Use private handkerchief instead of paper
- Consider to get just enough toilet paper
- Combine using bidet to save toilet paper
- Select suitable thickness toilet paper
- Stickers to remind saving paper at canteen, pantry, toilet

4. Manage and reduce wastes

4.1 Reuse printed paper

- Use one side printed paper
- Reuse mail envelop, put new address sticker on top of old one
- Reuse old envelop for internal circulation
- Use paper with old header/footer internally
- Reuse paper folder
- Reuse used cartoon paper boxes
- Reuse old newspaper, use used paper for goods packing purpose

4.2 Recycle paper and wastes

- Create collection place for recycle used papers
- Should not equip private rush bin, should use center rush bin to remind staff about recycle and reduce paper wastes
- Equip recycle rush bin with clear instructions at special areas like: kitchen, pantry, public room

4.3 Practice waste recycle and separation

- Equip waste bins with clear labels: organic, inorganic, recycle
- Reuse plastic packaging such as: nylon bag, plastic/metal boxes, carton boxes…
- Reuse wastes to be usable goods: modify used boxes, bottles to be box for flowers, pens, stationaries...
- Compose organic wastes if possible
- Collect toxic wastes and send them to public collecting points, not mix them with other wastes in the rush bin.
- Collect electronic wastes to public collecting points

4.4 Design and renew office/building

- In case of office renovation, should utilize old materials/structures and select to contractor with solutions with less wastes
- Present old furniture/goods to other instead of through them away
- Use environment friendly materials such as paints, furniture, floors ...

5. Stationary and kitchen tools usage

5.1 Stationaries

- Establish purchasing policy with higher priority to environment friendly products
- Always request suppliers not provide multiple packaging, bags that not necessary
- Always review in detail to make sure not to buy unnecessary products or products with same functions
- Select suppliers that possible to provide multiple products, should not buy from many suppliers to save delivery works
- Select to use ink box that possible to reuse and refill
- Select ink type that produce from environment friendly materials such as ink made from plant
- Consider to purchase office equipment with multi-

ple functions (all-in-one), reduce single and small printers

- Share stationary and office equipment, create sharing corner that share not-in-use things to other people
- Always consider appropriate way to dispose office equipment

5.2 Kitchen tools

- Say no to one-time usage eating tools like disks, bow, utensils
- Select big package for daily goods and drink to save packaging
- Should not use small drinking package, should select bigger box instead
- Use cloth instead of paper tower
- Select products that possible to recycle and compose
- Use environment friendly products

6. Green Meeting and Events

- Always check the necessary of meeting/events, think about replacement solutions that could save emission of travelling, staying
- Select right place of meeting/event that minimize travelling of participants
- Select even service provider to support green requirements such as: limit using bottled water, set air conditioner at appropriate temperature, no need table and chair covers, turn the light at suitable level…
- Minimize printing works, stationaries, envelop, covers before, in and after meeting/event, use online and electronic materials
- Reuse name badges and encourage participants to do
- Reuse banners, backdrop or replace by using projected backdrop
- Reduce foods delivery and handling, prioritize local foods, organic food and not use food with toxic preservative
- Encourage participants save foods, get enough amount and not through foods away
- Encourage wastes separation.

B - GO MANAGEMENT SYSTEM IMPLEMENTATION TOOLS

1. Interview form to evaluate sustainable lifestyle of office employees

Offices are encouraged to adjust to different targeted survey people. Use for before and after training.

Direct interview or use google form

Interview form to evaluate sustainable lifestyle of office staff

Interviewer: .....

Interviewee:..... .....

Date: .....

1.Do you know about monthly electrical consumption level of your office? ☐ Yes ☐ No

2. Saving energy is your responsibility? ☐ Yes ☐ N

3. What are your activities that you normally do to save energy in your office? .....

.....

4. Do you use printing paper in your daily working activities? ☐ Yes ☐ No

5. What way do you use to save printing paper? .....

6. Please list down the usage functions of tissue and toilet paper in your office .....

.....

7. What way do you use to reduce tissue and toilet paper? .....

8. What kinds of stationary that you use the most? .....

.....

9. Do you find any waste in using of stationaries in your office? .....

.....

10. Do you think that water is necessary to save at your office? ☐ Yes ☐ No

11.What do you do to save water? .....

.....

THANK YOU!

Consider to use survey of WWF for additional evaluation:

http://goquestionnaire.wwf.fi/survey/index.php?sid=34985&lang=en

2 Sample of Organization's commitment

ABC office intents and commits to operate in an environmentally responsible system and emphasize continuous improvement of the environmental performance in all office activities.

ABC office is committed to reducing its environmental footprint while carrying out its mission of developing, integrating and sustaining the right technology solutions.

ABC is implementing Green Office policy on which the Environmental Management Systems (EMS) is built. To support our EMS, all personnelworking at ABC will conduct t and perform duties in accordance with the following principles:

- Ensure compliance with applicable Local and State environmental laws, regulations, policies and all other requirements for which ABC subscribes.
- Reduce resource consumption and environment effect through reducing CO2 emission
- Look to improve the environmental performance of all activities, products & services
- Educate all associates on their environmental responsibilities.
- Increase public awareness of our commitment to protect the environment.
- Report truthfully all environment effects of office activities.

Director
(signed)

3 Sample of Rewarding Policy

REWARDING POLICY

Applied period: 1/1/2016 - 31/12/2016

Activity	Unit	Score	Remark
Having good practice	1 action	500	1. Staff have to report to responsible person to record the score 2. Bus tickets have to submit after 2 days with your named on the back 3. All contributed ideas will be appreciated and evaluated.
Provide good feedback and initiative	1 idea	100	
Participate in taking care office garden/plants	Times	60	
Walk or ride bicycle to office	Times	60	
Walk or ride bicycle for office's works	Times	40	
Use bus to office**	Times	40	
Share motocycle	Times	20	
Have not good practice*	1 action	-40	

* Violate one of green office rule

** Collect bus tickets for lucky withdraw activity

Reward	Mini score	Prize	Remark
The Greenest section	1140	VND 1 Million/person	
Top 3 Greenest employees	2280	VND 3 million/person	
Lucky draw	2280	VND 2.5 million/person	excluding top 3 greenest employees.

Director
(signed)

4 Sample of walk-through assessment

Areas	Main consumption	Assessment
Meeting room	Electricity	
	Drinking water	
Working station	Lightning	
	Printing paper	
	Air conditioner	
Pantry	Electrical kettle	
	Microwave	
Restroom	Tissue	
	Toilet paper	
	Taps	
...	...	

5 Samples of Practice regulations

OFFICE LIGHTING REGULATIONS & INSTRUCTION

1. Lighting will be turn on from 8h00 to 12h00 and 13h00 to 17h00.
2. Lighting is only turn on for the office area with working staff. Turn off lighting if there is not staff working in the area.
3. Encourage to use natural light by open window shade at comfortable lighting. Remember turn off the light when open the shade
4. Encourage using table lamp for the area with less working people
5. Remember always turn off lighting in meeting room, pantry, toilet, corridor when not in use

ALL STAFF ARE REQUESTED TO OBEY THIS INSTRUCTION

6 Sample of Office sustainable consumption policy

OFFICE SUSTAINABLE CONSUMPTION POLICY

Table of contents

7 Sampe of Sustainable initiatives action plan

No	Initiative	Current Status	Short/Medium/Long term	KPI/Expense	Expected results	Due time	Person in charge

8 Sample of Action plan

No	INITIATIVE	CURRENT STATUS	ACT. TYPE	KPI/ EXPENSES	EXPECTED RESULT	EXPECTED SAVING			DUE TIME	PIC
						By month	By year	Ton $CO_{2tđ}$		
ENERGY		**1,990 KWh per month**			**Reduce 20% compared to same time of previous year**					
TRUYỀN THÔNG/ QUY ĐỊNH										
1	Greek Office bulletin	Not yet	Short term	Clear and update	Inspire, interest, create environment				M1	Nam
2	Air-conditioner instructions (in office, in classroom, in / out working hour)	Not yet	Short term	Clear and easy to follow	100% staff understand and follow				M1	Yến
3	Lighting instruction (in office, in classroom, in / out working hour)	Depend on each staff	Short term	Clear and easy to follow	100% staff understand and follow				M1	Yến
STAFF BEHAVIOUR CHANGE					**Contribute to 5% reduction**	**100 KWh/ month**	**1,200**	**0.8**	**M1-M3**	**Dương**
1	Only turn on the air conditioners when and where is needed	Staff is free to control	Short term	Effective	100% staff follow					
2	Turn of the lights in office, classroom, toilet… when not in use	Not consistent	Short term	Effective	100% staff follow					
3	Utilize natural light in office, classroom once it's possible	Not yet	Short term	As much as possible	70% staff follow					
4	Use center contactor to easy switch off the printers, computers, fax, scanner… at the end of the day	Not consistency. Need to turn on and off many times	Short term	Convenience	100% staff follow					
EQUIPMENT					**Reduce 15% compared to same time of previous year**	**300 KWh/ month**	**3,600**	**2.4**	**M4-M6**	**Nam**
1	Change too old air conditioners to modern ones (Inverter, 2HP)	Old equipment consumes more energy – estimate expenses and capacity of these old equipment	Mid. term	~ 20 mils. VND/ unit	Reduce 20% energy consumption					
2	Change old fridge (used more than 10 years)	Old equipment consumes more energy	Mid. term		Reduce 20% energy consumption					
3	Change old disks sanitizer (some functions are out of order)	Old equipment	Mid. term		Reduce 20% energy consumption					

No	INITIATIVE	CURRENT STATUS	ACT. TYPE	KPI/ EXPENSES	EXPECTED RESULT	EXPECTED SAVING			DUE TIME	PIC
						By month	By year	Ton $CO_{2tđ}$		
ENERGY		**1,990 KWh per month**			**Reduce 20% compared to same time of previous year**					
EQUIPMENT (continue)					**Reduce 15% compared to same time of previous year**	**300 KWh/ month**	**3,600**	**2.4**	**M4-M6**	**Nam**
4	Add central contactors at printers, computers, scanner… to turn off at the end of the day	"on" 24/24	Short term	< 200K. ND /unit, 1 mil. VND in total	Reduce 5% energy consumption					
5	Rebuild and add the lighting contactors to control the lighting by area	Random distribution, could not control light by area or as request	Mid. term	Around 2 mils. VND	Reduce 5% energy consumption					
6	Change to new window shade	Not utilize natural light	Mid. term	Around 290-450K. VND/1 m2, ~ 12 mil VND in total	Reduce air conditioner, save 10%					
7	Gradually change Neon bubbles to LED one	Old and not save	Mid. term	Philip LED =500K. VND/unit (1.2m)	Reduce 50% energy for lighting					
WATER		**35 m^3/month**			**Reduce 10% compared to previous year**	**3.5**	**42**	**0.01**		
COMMUNICATION										
1	Design. Find the posters that instruct / remind how to save water. Post at public areas	Not yet	Short term	Inspired pics.	Inspire staff				M1	Yến
2	Encourage to use plastic base to clean fruits	Not yet	Short term	convenience	Save water				M1	Nguyệt
3	Set the fixed times to clean glasses as a batch	Clean many times/day by individual	Short term	3 times in day (Morning: 8:00 ; 12:30. Afternoon: 4:00)	Reduce cleaning liquid to 50%				M1	Nguyệt
4	Re-arrange the cupboard, every staff should have private cup	Messy, not enough place, not clean enough	Short term	need less space	Tidy and need less space				M1	Nguyệt
BEHAVIOUR CHANGE									**M1 - M3**	**Dương**
1	Staff take care their drinking by themselves in all internal meeting	Staff change and use multiple cups /day	Short term	No cost	Save drinking water, cleaning water					

No	INITIATIVE	CURRENT STATUS	ACT. TYPE	KPI/ EXPENSES	EXPECTED RESULT	EXPECTED SAVING			DUE TIME	PIC
						By month	By year	Ton CO_{2td}		
BEHAVIOUR CHANGE (continue)									**M1 - M3**	**Dương**
2	Encourage staff to use/change only 1-2 cups / day	1 staff has many cups and clean many times a day	Short term	No cost	Clean and save water and cleaning liquid					
3	Use grey water to watering plants and wash the cleaning cloths	Not yet	Short term	No cost	Reduce 10% water to plant watering, cloths cleaning...					
4	Use floor cleaning agent only 1-2 time/ week	Use 4 times/ week	Short term	No cost	Save floor cleaner (73.500 VND / 6 weeks)					
EQUIPMENT										
1	Equip the tank to keep grey water	Not yet	Short term	50,000 VND	Use to clean WC floor, balcony, plant water-ing...				M1	Nguyệt
2	Change disk cleaning agent to environ-ment and health friendly one	Chemical cleaning agent (cost 117,000 VND / month)	Short term	Good for health and environment (cost 58,000 VND / month)	Save 50% consump-tion				M1	Quyên
3	Change the tap with low flowrate	High flowrate taps	Mid. term	Change to saving tap (6 mi. VND in total)	Save 20% water				M4-M6	Quyên
PAPER	**Printing paper** **Toilet paper**	**7.5 ram/month** **100 rolls/month**			**Reduce15%** **Reduce 20%**	**1.25** **20**	**15** **240**	**0.05** **0.05**		
COMMUNICATION									**M1**	**Yến**
1	Issue using instruction of all paper types	Not yet	Short term	No cost	Clear message and inspiring					
2	Direct and indirect remind	Not yet	Short term	No cost	Change habit					
BEHAVIOUR CHANGE									**M1 - M3**	**Dương**
1	Always think before printing	Not control printing content, sometime in-cluding advertisement pictures	Short term	(*)	Save paper and ink (50% ink + paper)					

(*) - Use only new paper for important documents
- Use one-side used paper to print internal documents

(*) - Not printing directly from website, copy to MS word to check the content before printing
- Always format before printing: appropriate font, preview carefully before printing

No	INITIATIVE	CURRENT STATUS	ACT. TYPE	KPI/ EXPENSE	EXPECTED RESULT	EXPECTED SAVING			DUE	PIC
						By month	By year	Ton CO_{2e}		
BEHAVIOUR CHANGE (continue)									**M1 - M3**	**Dương**
2	Saving instruction to staff when using office applications and printing application		Short term	No cost	Save 20% ink and 10% paper when reduce font smaller 1 size					
3	Only print when needed, limit to print the draft, use e-document, e-brochure…	use e-brochure & paper brochure	Short term	No cost	Save 10% printing paper					
4	Save up to 50% cost of brochure, leaflet printing	Separation in design, printing and distribution	Short term	No cost	Save more than 30% cost, time, manpower, design, contract, production, storage…)					
5	Have center to manage works of brochure/ leaflet design, printing and distribution	Separation in design, printing and distribution	Short term	No cost	Save more than 30% cost, time, manpower, design, contract, production, storage…)					
6	Have center to manage stationaries: get good price and control usage	Buy by section	Short term	Admin responsible to buy, not buy by section	Save cost and transportation					
7	Encourage using toilet paper at right function and amount with clear instruction	Use 76 rolls/month	Short term	- At toilet: 3 sheets/time * 6 times /day	Save toilet paper					
EQUIPMENT						**- In the pantry: 1 sheet/time * 2 times/ day**	**Save paper**		**M4 - M6**	**Nam**
1	Buy multi-functional photo/printer RICOH MP 201SPF	Standalone printer, photo, fax, scanner	Mid. term	48,300,000 VND	Save paper and ink Save office area Save maintenance cost					
2	Buy printing software to control office printing works	Not yet	Mid. term	7,668,000 VND	Save more than 50% ink amount with similar quality					

C - TOOLS FOR SUSTAINABLE LIFESTYLE TRAINING

1. Methodology

1.1 Stages of Change model

by Prochaska et al (1983)

The Stages of Change model provides a framework for explaining how behavior change occurs in people after the context is understood. The Stages of Change model consists of five stages, which can help determine where individuals are in the process of changing their attitudes and behaviors related.

1. Precontemplation: People in this stage are not thinking about changing their inactive or sedentary behavior and are not aware of their problem. They have not considered changing.

2. Contemplation: People in this stage have thought about their problem, can identify that they are unsustainable, and have devoted some thought to changing. They have not taken action to change, or they may be beginning to consider options for change.

3. Preparation/Decision: People in this stage have begun the process of change by examining possibilities and options, such as separating garbage, using energy efficient light bulbs, using rain water, or recycling paper.

4. Action: People in this stage have taken steps to overcome their sedentary lifestyle by modifying their behavior, experiences, or environment in order to overcome their problem. Action involves the most overt behavioral changes and requires a commitment of time and energy. Early indicators of the action stage include steps such as researching different recycling possibilities, investing in energy saving electronics, making a shopping list, refusing plastic bags, and not littering...

5. Maintenance: People in this stage consolidate the gains attained as a result of initial action through sustained involvement in the new behavior, in this case a sustainable lifestyle (or avoidance of the old behavior—unsustainable consumption). Adoption of the new behavior usually requires a few weeks.

Figure 6. Stages of Change Model. Source: GetGreen Vietnam project

1.2 Motivation - Opportunity -Ability (MOA)

by Ölander and Thøgersen (1995)

The motivation-opportunity-ability (MOA) model explains behavior change as:

1. a product of factors internal to the individual, the motivation (attitudes, values, habits and personal norms)

2. a product of external factors, the opportunity (fiscal and regulatory incentives, institutional constraints and social practices); and

3. a product of triggers, the ability (knowledge, habits).

The model explains that all factors need to be understood before an effective program can be executed. The following figure shows the correlation between the factors.

Although the model is used in the preparation stage to create a mapping, it can also be a great aid when trying to understand why people are not applying certain tips. Please notice that intention is dependent on personal motivation factors but is influenced by the ability (money, time, habit, knowledge) and opportunity (circumstantial possibilities) of that person before it can come to behavior [24].

24 Refer to GetGreen Vietnam project

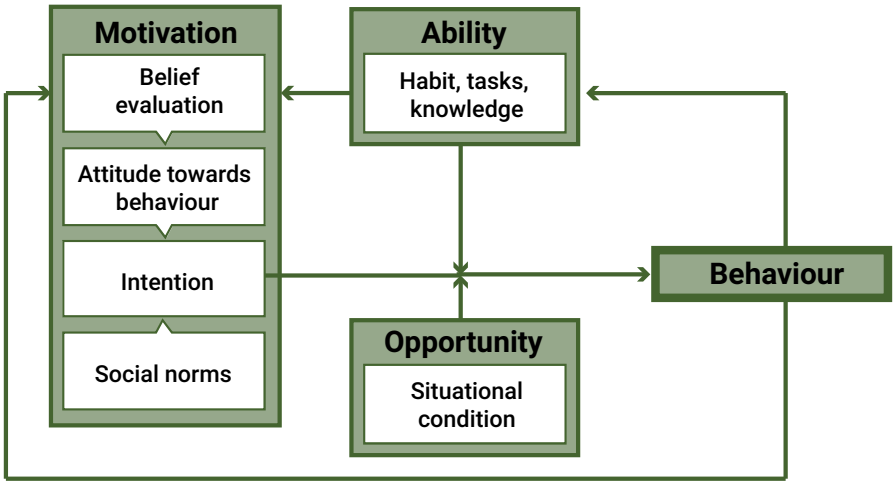

Figure 7. Motivation -- Ability - Opportunity Model. Source: GetGreen Viietnam project

2 Sustainable lifestyle training program

INTRODUCTION

1

The first training session is for introduction. The office staff will be inspirited about pollution situation, roles of individual, benefits of staff, office and environment if GO program is implemented. Provide green office objectives and policies, current consumption status of the office (as result of Activity 2: Base year assessment). Trainer also should introduce success green office model to image about GO and create the confident. This session purposes to move the staff from PRE-CONTEMPLATION state to CONTEMPLATION state.

TRUYỀN ĐẠT KIẾN THỨC

2 & 4

The next training sessions will help the staff to change their behaviors with selected topics. To ensure that sustainable topics are delivered following up all stages of behavior change model, training session number 2 and 4 will focus on providing inspirational information – PREPARATION/ DECISION stage, and upcoming are session number 3 and 5 for field trips with more opportunities to practice and take actions – ACTION stage.

Structure of inspirational information session include: introduction to current problem, finding the reason, inspirational presentation (presentation, video, case stories…), group working to find improvement solutions (at simple level, easy to act in daily activities such as setting auto switch off computer monitor, reduce font size when printing documents, wastes separation, bring plants to office…)

THỰC HÀNH

3 & 5

Staff participating in the training will be grouped to practice proposed solutions in the coming weeks. GO team is responsible for supporting the practices of staff by simple tools such as reminding notes, guiding to set auto switch off computer monitor, providing waste bins for separation…

Field trip could be a visiting trip to nearby green offices (recommend in the session #3) or holding a workshop to reflect results of the practice by groups and cross auditing implementation results of other groups. Trainer should include activity to credit achieved results and to share the experience (motivations and barriers) at the end of these sessions.

TỔNG KẾT

6

The summary session (#6) is to reflect the training sessions and to strengthen the sustainable actions and maintain them, MAINTENANCE step in Behavior change model. This meeting could be organised as a Sustainable Day that involves all staff. GO team should communicate about GO objective and implementation plan (Activity #3) to all staff at this meeting.

Refer to ***Appendix C -1 Stages of Change Model***

3 Sample of Training lesson plans

Example: Introduction lesson plan.

Time	Activity	Objective	Content
15m	Game	Introduction: trainer and participants	Get to know each other game: select game to introduce each other
			Icebreaking game: understand the participants' expectation
15m	Presentation	Project Introduction	Project introduction: presentation file
15m	Video and Problem presentation	Sustainable	Sustainable consumption video (database_tham khao)
			Sustainable consumption presentation (GO database_tham khao)
15m	Training plan	Implementation Plan	Presentation of 6 meetings and topics
05m	Question and Answer	Answer questions	
15m	Break	Networking	
15m	Introduction Presentation	Sustainable and GO commitment	Understand office current consumption status
			Inform GO sustainable commitment
15m	Clip & Presentation	GO models	Present some models of GO in Vietnam: UN GO, Tanner Vietnam
05m	Wrap up	Summary	
05m	Challenge	Assign easy challenge to participants	Example: turn off the lighting, turn off computer monitor, use only 1 paper sheet at hand wash base, use glass to brush teeth...

Example: Provide Information lesson plan – Energy saving

Time	Activity	Objective	Content
10m	Review challenge	Explore barriers and motivations	Share barriers and motivations of staff. Ways to overcome barriers
10m	Game	Introduction: warm up / create open atmosphere	Game: Energy saving- http://www.youtube.com/watch?v=1-g73ty9v04
			Share barriers and motivations of staff. Ways to overcome barriers
10m	Show video	Environment effects: Enjoy/ Afraid/ Interest	Video explain sources of energy https://www.youtube.com/watch?v=__zB80Saglk
			Video about of global warming effect - Haiyan storm
10m	Problem introduction	Activities of consumers, knowledge, information	- Current status of big city electrical consumptions in VN and energy for office and household is significant number - How much of natural resource to create 1 unit of electricity and effect of it to environment – CO2 footprint - Valuable campaigns to save electricity (in the world and in VN) – Contribution of consumers.
15m	Break		
25m	Game	What the consummers could do to save energy	- Game: "we bet that we could save… % monthly electrical bill". Trainer provides list of office equipment using electricity and tips to save energy for each equipment. - Group working to come up the saving numbers of each group of participants. - Group presentation. Group with more solutions and saving will be the winner.
30m	Team work	Action plan	Action plan for initiatives that possible to do in short term, assign group/person to take action, time to action… Group presentation
05m	Wrap up	Summary	
05m	Challenge	Take action	Select a solution in the game to assign to staff or group of staff.

Example: Field trip lesson plan/ Visit GO model

Time	Activity	Objective	Content
10m	Challenge review	Find barriers and motivations	Share barriers and motivations of staff. Ways to overcome barriers
05m	Activities introduction	Provide information	Provide needed information about activities of the visit
10m		Provide needed information about activities of the visit	Provide information about the model place for participants to get to know the place easily
05m	Visit place introduction	Get to know about the place	Provide information about the model place for participants to get to know the place easily
60m	Team activity	Get attention	Organise activities/ contest to experience the place effectively
10m	Visit	Learn from model	Listen to presentation, visit, ask questions
05m	Challenge	Action	Select new solution to implement at the office in next week

Field trip at the office

Time	Activity	Objective	Content
10m	Review challenge	Find barriers and motivations	Share barriers and motivations of staff. Ways to overcome barriers
30m	Group presentation	Provide results	Group presentation about results they achieved and barriers
20m	Visit	Evaluation the implementation	Visit and evaluate all solutions/actions that groups implemented in the office
15m	Break		
15m	Game	Team building	Motivate and get closer
30m	Round table discussion	Reward and problem solving	Reward for achieved results Find the solutions, supports for difficult initiatives Next action plan

Example: Summary session lesson plan.

Time	Activity	Objective	Content
10m	Review challenge	Review previous challenges	
10m	Game	Warm up	
15m	Topics summary presentation	Review the knowledge	Summary knowledge of session 2 & 4
15m	Contest game	Experience green tips again	Select game that load tips in guide book. See ***GO database_tham khao***
15p	Clip/ picture of activities	Share the results	Reward to excellent staff and group
15m	Break		
20m	Evaluation	Awareness and Behaviour change evaluation	Trainer may select the appropriate way to evaluate (corresponding to previous assessment) to compare and evaluate effectiveness of training (interview, focus group, questions table).
20m	Presentation	GO implementation plan in detail	GO team present sustainable initiatives implementation plan to all staff

4 Situational guide for trainer

1

Participants don't respond well to the proposed materials

Reason

There is no "one-size-fits-all" solution..

What this means

Different people react differently to the exact same circumstances. You know your audience well.

Suggestion

1. Find a characteristic that is exclusive to your target group. For example: family-oriented, materialistic, social status, price sensitive…
2. Adjust or develop activities focused on that characteristic. For example: for family-oriented people you may want to stress the long-term effects of unsustainable behaviour on their children, whereas for materialistic people you may want to focus on the beauty and durability of sustainable products.

2

There is a gap between INTENTION and ACTION

Solution

Check the barriers.

What this means

Sustainable behaviour is easier and thus more likely when people face few barriers to sustainable action. Find out what are the barriers people are facing when trying to carry out a specific behaviour.

Suggestion

1. Pick a few desired sustainable behaviours
2. Work with your group to identify the barriers for each behaviour
3. Separate the barriers in both:
   - Internal OR external (e.g. lack of knowledge vs. lack of available resources)
   - One-time behaviour OR repetitive behaviour (e.g. purchase of new car vs. daily transportation)

After you have done this with all the desired sustainable behaviours, decide with the group which barriers are the easiest to overcome to achieve one of the desired sustainable behaviours.

3

Only part of the tips is applied

Reason

There are many forms of action.

What this means

There are different possible ways of engaging people in actions towards behavioural change:

Educational, Persuasive, Direct behaviour

.

Suggestion

1. Evaluate the activities you have chosen/adapted for your group according to the types of actions above.
2. Are you focusing only on 1 or 2 types of action? How can you focus on more? Choose different activities or adapt them in such a way so that you approach a tip in different ways. For example: 'refusing plastic bags' and 'buying a cloth shopping bag' have the same intention in terms of behaviour change but use a different perspective.

4

The tips are too difficult to apply

Solution

Small changes do add up.

What this means

The cumulative effects of what we each as individuals do can be either devastating (each American's bottle of water drunk after the gym adds up to 2 million bottles sold every 5 minutes) or healing (if every household were to plant native species in their gardens).

Suggestion

1. Pick a topic directly related to the lives of your target group.

   Research estimations or statistics of the consequences of this topic (e.g. traffic accidents still kill 26 people and injure 81 others every day in Vietnam*)

2. This kind of information can be good to shock or inspire people. Choose which you want to do. You can show this just to point out the importance of adopting a more sustainable lifestyle in general, or actually propose starting a wave of small changes.

* Source: http://www.thanhniennews.com/index/pages/20131122-vietnam-considers-banning-motorbikes-in-big-cities.aspx

5

There is interest but no motivation

Solution

Understanding individual motivation helps create better dialogue.

What this means

Gaining a better understanding of how groups of individuals think about sustainability and environmental problems can help create more effective ways to talk about behaviour change towards sustainability issues

Suggestion

1. Find out what is the motivation of your target group to engage in sustainable actions.

2. Focus your speech on these motivations. For example, according to research, emphasizing the economic aspects over the nature-conservation aspects, is likely to engage a broader segment of people.

6

The challenges are not executed

Solution

Encourage positive social hints for sustainability.

What this means

We are all constantly modifying our behaviour based on social signals from others. Though it sounds simple (and it is simple), it is a powerful behaviour-shaper that is underutilized in our quest for a more sustainable society.

Suggestion

Make it explicit: tell people to notice sustainable actions and to reinforce them with positive social cues: smiles, words of support, compliments, stickers, pins, badges, taking a picture and posting it on a social media tool for example...

7

Participants feel alone in applying the tips

Solution

Make sustainable behaviour the social default.

What this means

Research shows that people respond more positively to a behaviour, and will imitate that behaviour, when there is social proof for it. Social proof does not have to come from a real and present group of people. For example, people find their social proof in the craziest of places: laugh tracks during movies increase perceptions of funniness, tip jars with a bit of money increase likelihood of tipping, advertisements featuring large numbers of people favoring a product increase the perception that the product is good, stickers on a product claiming "most popular" increase sales.

Suggestion

Think of a sustainable behaviour and what social proof of this can you provide your target group. For example, direct ways of providing social proof include showing your target group a large number of people behaving in a certain way.

Show people how their impact is multiplied by all the other people who are taking similar sustainable steps in their lives.

8

Participants don't feel proud of their success

Solution

Provide opportunities for people to demonstrate.

What this means

People also notice the actions of people around them (social proof, as discussed before). The more often we see a particular behaviour, the more it becomes "normal" and we internalize it as a norm. For example, some fashions at first are very strange and then widely accepted as more people use them.

Suggestion

1. First notice situations where a particular behaviour (e.g., commuting by bus) could be made more public.
2. Develop something to make it explicit. For example, in an office, bus commuters were given a special badge holder for bus riders only.

Tip: It is possible to provide opportunities to "demonstrate" a behaviour even when that behaviour is something hidden or non-obvious, such as insulating a home. For example, outdoor signs stating "This home is becoming energy efficient!" make it clear to neighbors and people passing by that yet another home is taking action. Other strategies include flyers, neighborhood newsletters, or pictures published in a local paper.

9

Participants seem bored

Solution

Engage thinking with something surprising.

What this means

One way to get people's attention is to surprise them with a startling or unexpected piece of information.

Suggestion

1. Research information about sustainable consumption that can be shocking or surprising
2. Think how you can visualize this information in a surprising way.

10

Difficult to relate to global issues

Solution

Difficult to relate to global issues

What this means

We humans take special interest in anything that is related to our own selves. Again, our very survival has historically depended on it. Messages that people perceive to be personally relevant receive significantly more attention.

Suggestion

Even though human beings are part of the environment and nature, a significant number of people think of "the environment" as something separate, like "the moon" or "the trade deficit" that is not immediately affecting their lives. Therefore, avoid talking about "environmental issues" or "the environment." Instead, point out the human aspects of environmental issues: "the air we breathe," "the water we drink," "the resources we rely on," "the climate that sustains human life."

11

Participants don't think it is their responsibility

Solution

Make relation with personal values.

What this means

One of the side effects of our modern stressful and hurried lives is that we rush through our days on autopilot, not really thinking through the impacts of our decisions, we sometimes do things that we later realize are incompatible with our values.

Suggestion

In the context of reframing environmental messages, studies suggest it is more effective when emphasizing deeper values and reminding people how sustainable actions (or sustainable living) can contribute to things like being needed by/connected to others, making a difference in the world, being competent, and creating a good life for you and your future generations.

12

Participants find the tips too challenging

Solution

Focus on improvement, not perfection.

What this means

People frequently find themselves paralyzed by confusion: they want to do the "right" sustainable thing, but are not sure which of their options is the most sustainable.

Suggestion

Instead, of trying to achieve the perfect sustainable action, just focus on basic questions about the broader impacts of their choices such as:

- Do I really need this?
- Can I borrow this instead, or find it used?
- How far away has it come from?
- Could this be done/created with less waste?
- Is there a lower energy way of doing this?
- Could this item and/or its packaging be recycled?

13

Participants don't know how to apply the tips

Solution

Give "how-to" information.

What this means

Is knowledge important in motivating a sustainable action? It depends on the type of knowledge. A study found that a basic knowledge of ecological systems has only an indirect influence on sustainable actions. A more direct and powerful creator of sustainable behaviour is whether a person holds the "how-to" knowledge necessary to carry out the behaviour.

Suggestion

In addition to providing opportunities to try a behaviour, it is also helpful and important to make available clear, task-specific direction. Create "how-to" resources: a fact sheet with step-by-step directions, illustrated instructions, a video. People need opportunities to safely gain the knowledge and skill they need. What is required is a chance to try something out in a supportive, no-stress, non-threatening environment. The answer: hands-on opportunities to practice a new behaviour.

14

Participants don't know where to start

Solution

Communicate effective actions.

What this means

People are more likely to choose actions that they believe are effective. Information on effectiveness is often unavailable, conflicting, or unclear. For example, people with intentions to act more sustainably are taking action, but their efforts could be focused on something with much more impact. One study has found that people greatly overestimate the effectiveness of recycling, while they underestimate the negative impact of behaviours such as meat eating and air travel.

Suggestion

Providing people with an indication of the effectiveness of different sustainable actions will help them to maximize their positive impact. It will also reinforce people's sense of autonomy because it gives them the power to choose particular actions based on their effectiveness.

15

Participants feel powerless

Solution

Balance urgency with realistic hope.

What this means

How should serious environmental issues be presented? On the one hand, it is important that we understand the risks we are facing, and that we see these risks as potentially affecting us personally. On the other hand, if all we hear is doom and gloom, our psychological defense mechanisms are likely to shut down any possibility of action that might help address the problem.

Suggestion

Sustainability campaigns should encourage hope and positive emotions. They should focus on increasing people's response efficacy (i.e., "There are effective solutions to these serious environmental threats.") and their sense of personal efficacy (i.e., "I can carry out the actions necessary to avoid and/or address these threats.")

16

Participants don't believe the effects

Solution

Overcome perceptual barriers.

What this means

Human perception is limited. None of our senses can detect common pollutants like carbon monoxide, sulfur dioxide, or fine particulate matter. Perception is also limited by location and point in time. We cannot personally detect Amazon rainforest destruction because it is occurring far away: distance is a perceptual barrier. The slow time course of most environmental changes is also a perceptual barrier: the human senses are good at picking up abrupt changes but very poor at perceiving slow, incremental change.

Suggestion

One powerful way to overcome perceptual limitations is to recreate the information missed by our senses with a vivid, concrete image.

17

Participants don't answer questions

Solution

The wait time rule.

What this means

Sufficient wait time followed by each question encourage audience participants. If there is no wait time of waiting time is too short, one to two seconds, the audience just give a quick answer without really thinking about the question or simply giving up with the "I don't know" response. Three to give seconds is commonly recommended as the sufficient waiting time.

Suggestion

• Prepare suited questions that induce thinking and ask them during the instruction.

• Then wait at least 3 seconds without looking at the participants

• Then ask for contributions to your question. Because you gave thinking time you will get high level answers.

For example: you can let your participants describe a process. While describing, questions arise automatically: Why is this so? What will happen later? People ask for reasons. Thinking occurs. While training instructors should often ask: "Why?"

18

Participants don't know how to apply the tips in their daily lives

Solution

Participants don't know how to apply the tips in their daily lives.

What this means

When participants with different knowledge and different experiences come together they bring various ideas and suggestions. Sometimes "non-professionals" have the best and ideas and inspire the expert with their unusual ideas. Brainstorm allows creativity and spontaneity.

Suggestion

Make groups of 5.
Assign a topic, a time limit (15-20 minutes is usually sufficient) and some simple rules:

- No discussion - just ideas (quantity not quality at this stage)
- No judgments of any idea presented
- One idea can generate another idea
- Organise ideas into categories
- Connect related ideas. Eliminate ideas that are contrast.
- Develop most feasible ideas and summarize your session.

19

Participants find the message difficult to grasp

Solution

Use analogies.

What this means

Analogies make abstract numbers into something people can understand or visualize.

Suggestion

For example, "Recycling just one plastic bottle saves enough energy to power a light bulb for 30 hours." or "An American taking a five-minute shower uses more water than the typical person living in a developing country uses in a whole day."

20

Participants already know all the issues/tips

Solution

Present it anyway, but in detail and focus on the motivations and barriers.

What this means

Presenting tips again is still useful because this time we present each tip in detail. A tip known by a participant may not be known by another.

This is called the constructivist learning method. In high education and adult training, it has been proven as the most effective way of teaching and learning and has been applied widely in most of student-oriented institutions. To put it simple, we ask for "the known" (own understanding of learners) then add up "the unknown" (new knowledge); learners construct their knowledge by themselves by comparing/ contrasting/connecting the old and the new stuff. In that way, we can relate any new knowledge to individual learners making it easy to understand, remember and apply for learners.

Suggestion

Select important, highly motivating tips to focus more. Continue the lesson as usual and approach the participants positively for their knowledge so they feel encouraged. Remember that as soon as some people say they already apply the tips others may be shy to admit that they don't.

21

Implementation team is not interested and supportive

Solution

Build up the implementation team work culture in which every member will support each other as much as possible.

What this means

Implementation activities are not required special knowledge or experience. The operating efficiency mainly depends on the team members' attitude. Provide clear instruction about member's roles, agreed implementation methodology and welcome all opinions will be good motivation to get interest and supports of all members.

Suggestion

Always support team members to overcome issues and difficulties. Keeping on motivation all the way.

22

Participants don't participate

Solution

Encourage participant engagement.

What this means

Participant engagement is the combination of paying full attention to the presentations, enthusiastically answering questions when asked, actively contributing to group discussion and brainstorming sessions and asking questions. The more participants engaged in meeting's activities, the less memorization they do which results in the more engagement in higher level of thinking including analysis, synthesis and evaluation. Engaging actively in meeting's activities also allows participants to comprehend the training material at a deeper level therefore they learn much better, become critical thinkers and be able to apply the new knowledge to their daily lives.

Suggestion

- When presenting information, stress on important topics.
- Use stories related to the participants' living and working conditions.
- Move toward distracted participants, stand next to them or direct the questions to them.
- Effectively use eyes contact and movement to connect to the audience.
- If the audience looks tired and not concentrated, stop presenting to ask questions. Start with simple questions then move to complicated and abstract ones. Remember the wait time rule.

23

Top management does not support the project

Solution

Establish close relationship from starting time and along project implementation period.

What this means

Most of Organisationare busy with multiple projects running at the same time, long time implementation project may cause miss-focus. The agreement that define clear responsible of parties, activities in detail such as tasks, time to accomplish, required manpower, finance supports… will be good way for top management to follow and support. It's also good if top management is updated implementation status so that they will put more attention to the project.

Suggestion

Create good relationship to top management and implementation team, Organise meeting periodically to maintain the interest and attention.

Need the documented agreement among project, trainer, consultant, implementation team and top management at starting step of project.

24

Behind the project plan

Solution

Together discuss to find the reason and solution to back up the schedule.

What this means

It's normally take more time at the beginning steps because not every people understand well about the requirements and methodology. It's may be faster at the next steps once everyone understands well and ready to speed up.

Suggestion

Keep following the progress to capture possibility of delay and have actions to correct right the way.

25

GO implementation member, in almost case GO work is his/her additional job, refuse or delay doing activity

▶ ***Solution***

Call the support of higher management. Consider to add GO contribution KPI to his/her performance review.

▶ ***What this means***

In case of GO member is so busy man, GO team could consider to find replacement for different implementation stage. Or request overtime to accomplish the work. In many cases, team member is possible to manage the job if they are well encouraged and recognized.

▶ ***Suggestion***

Keep updating team member's works to his/her management to get support. Always recognize the contributions of all team members when they make the job done..

26

Office's consumption data collection is not easy and take time

▶ ***Solution***

Build up process for periodically data collection that suitable for office, not wait until reporting time, it's not easy to find the old information.

Assign responsible person to collect information and filling at shared place so everyone could be updated.

▶ ***What this means***

At the beginning, collect information may take time but is the collection process is in place that convenience for responsible person as well as saving time.

▶ ***Suggestion***

Establish data collection process right at the first 3 months of implementation that include name of responsible person, collect time, way to collect, storage address... and it's good to keep reminding at the beginning time.

27

There are significant change in office operations at implementation time like increase number of staffs, there are more projects that require travelling... that out of plan and lead to increasing emission number

▶ ***Solution***

Case by case, GO team need to have recommendation and action to limit effect of chance as much as possible.

▶ ***What this means***

This is also the chance for office to reconsider the solutions that support change in operation but also limit increasing of emission.

▶ ***Suggestion***

Beside total emissions, office could consider to calculate intensity data of emission by consider the factor that cause the variation to compare and evaluate.

5 Behavior change report

The report contents include:

1. Introduction about participants (number, job, age, gender, income…) and office descriptions (business type, locations…)

2. Training schedule and content: training outline

3. Before-training lifestyle survey report: evaluation method, quantity, results

4. After-training lifestyle change report: evaluation method, quantity, results

5. Analyse training results

- Compare before and after training: number of behavior and frequency
- Behavior group that practice the most
- Behavior group with less practice or not to do and the reasons
- Analyse by group of participants: by gender, age, working position…

6. Indirect training results

- Change in consumptions: electrical, water, paper, stationaries, equipment, wastes…
- Evaluations by implementation GO coordinator and team members Hiệu quả gián tiếp

7. Lessons learnt

8. Recommendations on GHG reduction or training program

D - ADDITIONAL GUIDELINES FOR GHG EMISSIONS CALCULATION

1. Examples for mandatory GHG sources calculation

***Example:** GHG emission from electricity consumption*

According to the electricity consumption summation of year 2013, Office X (based on the monthly electricity invoice), the total purchased electricity is 43680 kWh. Therefore, the CO_2 emission from electricity consumption could be calculated as below:

Emission = 420 * 0.36 * 0.8154 / 1000

= 0.12 ton CO_{2e}

***Example:** GHG emission from water consumption*

According to the water consumption monitoring of year 2013, Office X (based on the monthly water invoice), the total purchased water is 420 m^3. Therefore, the CO_2 emission from water consumption could be calculated as below:

Emission = 420 * 0.36 * 0.8154 / 1000

= 0.12 ton CO_{2e}

***Example:** GHG emission from paper consumption*

Office X only use printing paper and 180 gram was used in 2013. The weight of each ream is 2.81 kg. Therefore, the total consumed paper is 505.2 kg and the CO_2 emission from paper consumption could be calculated as below:

Emission = 505.2 * 1.09 / 1000

= 0.55 ton CO_{2e}

***Example:** GHG emission from office appliances*

Office X uses the office appliance such as computer screens, desktop computer, laptop, etc. and other office furniture. However, all of them were purchased during the period from 2010 to 2015 and reported in the relevant year report. In year 2016, **not any new equipment was purchased**, therefore in the emission report for year 2016, the CO_2 emission from this source is zero.

Emission = 0.0 ton CO_{2e}

***Example:** GHG emission from waste water*

According to the water consumption monitoring of year 2013, Office X (based on the monthly water invoice), the total purchased water is 420 m^3. Therefore, the assumed wastewater was also 420 m^3 and the CO_2 emission from wastewater generation could be calculated as below:

*Emission = 420 * 0.71 / 1000*

= 0.2982 ton CO_{2e}

***Example:** GHG emission from business travel*

Office X hires car or book flight ticket for staffs for business travelling. The car transportation contracts are based on the travelled distance in km. After the reporting period, X combined information from all contracts and found that the total distance by car was 2225 km and by business class flights was 32988 km. Therefore, the CO_2 emission from business travel in the reporting period is:

Emission = [(2225*0.19184) + (32988*0.39764)]/1000

= 13.54 ton CO_{2e}

***Example:** GHG emission from business stay*

During business travel, office X's staffs stayed 14 nights in hotels. Therefore, the CO_2 emission from hotel accommodation in the reporting period is:

Emission = 14 * 15.13/1000

= 0.21 ton CO_{2e}

Example: GHG emission from solid waste

Office X wants to report the emission from solid waste, however the wastes from different departments could not be collected and measured daily. So X applied the sampling method. In a normal working week, the responsible person requested the departments to collect all the solid wastes and classify into the following types: Disposal paper, cardboard, waste food, glass and plastic in all working days of the second week of Apr. In the end of each day, the responsible person weighed the groups and results were as below:

Solid waste type	Avarage solid waste per day (kg) A	Percentage (%) B	Total solid waste per year (kg) C = A*249*B	Emission factor D	CO_2Emission (tCO_{2e}) E = C*D/10^6
Disposal paper	25.0	40%	2,490.00	314.00	0.78
Cardboard		5%	311.25	314.00	0.10
Food waste		50%	3,112.50	680.00	2.12
Glass waste		5%	311.25	25.78	0.01
Plastic waste		0%	0.00	34.08	0.00

In the above table, 249 is the number of days that the office opened.

***Example:** GHG emission from emission intensity*

Office X operates in the tourism sector. In the base year 2014, X provided tourism services for 1000 visitors with a turnover of 10 billion VND and generating GHG emissions of 100 tons of CO_2. In the reporting year 2016, X provided only 500 tourist services with revenue of 5 billion VND and 60 tons of CO_2 emissions. So, the absolute amount of emissions in 2016 has fallen from the base year of 2014, but in terms of performance, in year 2016, X was lower performed than year 2014 because in base year 2014 the intensity emission per services provided and revenue were 0.1 tons CO_2/guest and 10 tons CO_2/ billion revenue, respectively while in the reporting year 2016, there are 0.12 tons CO_2/guest and 12 tons CO_2/ billion revenue.

Office X after the implementation period has the results as the table below:

No.	Emission source	Emission in base year (tCO_{2e})	Emission in reporting period (tCO_{2e})
1.1	Electricity consumption	11.93	9.92
1.2	Water consumption	0.05	0.19
1.3	Paper consumption	0.10	0.18
1.4	Emission from office appliances	0.00	1.26
1.5	Emission from waste generation	1.02	1.10
Total		13.10	12.65

At the absolute change, the office has reduced 3.4% of GHG emissions following the implementation of the green office program. However, due to the fact that the number of employees has increased, namely from 31 employees in the base year to 45 employees at the reporting period, Discharge per employee and the results show that the office has reduced average emissions by 10.20% for each employee.

No.	Emission intensity	Base year	Reporting year
1.1	Average emission per month (tCO_2/person/month)	0.07038	0.06320
1.2	Emission reduction	10.20%	

2 Guidelines for recommended GHG sources calculation

Emission from fossil fuel

Combustion of fossil fuel will generate 3 types of GHG which are:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)

In which, the emission is CO_2 in term of amount and global warming effect compare to CH_4 và N_2O.

Within the criteria, instead of calculating CO_2, CH_4 and N_2O emissions separately, the emission will be calculated based on CO_2 equivalent emission and by the composited emission factor.

Equation for calculating GHG emission from fossil fuel as below:

Emission from consumption of petroleum and diesel

$$Emission = \frac{C_{NL} * D_{NL} * NCV_{NL} * EF_{NL}}{10^6} \quad (Equation\ 13)$$

In which

Parameter	Explanation	Unit
C_{NL}	Amount of petroleum or diesel consumption	litre
D_{NL}	Density of petroleum or diesel	Kg/litre
EF_{NL}	Composited emission factor of petroleum or diesel	tCO_{2e}/TJ
NCV_{NL}	Net Calorific value of petroleum or diesel	TJ/Gg

Values of parameters in the above equation as follow:

Table 13: Default factor for petroleum [25]

Parameter	Value	Unit
$NCV_{NL,petroleum}$	44.3	TJ/Gg
$EF_{NL, petroleum}$	69.6	tCO_{2e}/TJ
$D_{NL, petroleum}$ [26]	0.7407	kg/litre

Table 14: Default factor of diesel [27]

Parameter	Value	Unit
$NCV_{NL, diesel}$	44.3	TJ/Gg
$EF_{NL, diesel}$	69.6	tCO_{2e}/TJ
$D_{NL, diesel}$ [28]	0.7407	kg/litre

***Example:** GHG emssion from petroleum consumption*

Office X has 4 cars and total consumed petroleum from these 4 cars in year 2015 is 2400 litres. Therefore, the CO_2 emission from petroleum consumption could be calculated as below:

Emission = 2400 * 0.7407 * 44.3 * 69.6 /10^6

= 5.481 ton CO_{2e}

Emission from LPG consumption

Equation for calculating GHG emission from LPG as below:

$$Emission = \frac{N_{LPG} * m_{LPG} * NCV_{LPG} * EF_{LPG}}{10^6} (Equation\ 14)$$

In which

Parameter	Explanation	Unit
N_{LPG}	Number of consumed LPG cylinder	cylinder
m_{LPG}	Average weight of LPG cylinder	Kg/cylinder
EF_{LPG}	Hệ số phát thải tổng hợp của LPG theo nhiệt lượng	tCO_{2e}/TJ
NCV_{LPG}	Net calorific value of LPG	TJ/Gg

Values of parameters in the above equation as follow:

Bảng 15: Hệ số mặc định cho LPG [29]

Parameter	Value	Unit
NCV_{LPG}	47.3	TJ/Gg
EF_{LPG}	77.8288	tCO_{2e}/TJ

***Example:** Emission from consumption of LPG*

Office X uses LPG stoves for cooking lunch for staffs. In year 2014, X consumed 9 LPG cylinders, each cylinder has weight of 12 kg. Therefore, the CO_2 emission from LPG consumption could be calculated as below:

25 Source: Volume 2 Energy, IPCC
26 Source: Energy Statistics Manual OECD 2004
27 Source: Volume 2 Energy, IPCC
28 Source: Energy Statistics Manual OECD 2004
29 Source: Volume 2 Energy, IPCC

Emission = 9 * 12 * 47.3 * 78.8288 /10^6
= 0.403 ton CO_{2e}

Emission from leakage of refrigerants

Due to the limitation in monitoring and complexity of IPCC method for estimating the emission from refrigerant in the cooling equipment (fridge or air conditioner), this GO VN criteria applied the simplified method including estimating the leakage emission from installation and annual operation (without considering the emission from equipment disposal)

Equation for calculating GHG emission from refrigerant as below:

Emission from installation

$$Emission = \frac{RC * GWP * L_{installation}}{1000} \quad (Equation\ 15)$$

In which

Parameter	Explanation	Unit
RC	Amount of charged refrigerant	kg
GWP	Global warming potential of refrigerant	
$L_{installation}$	Leakage rate when installation	%

Emission from annual operation

$$Emission = \frac{RC * GWP * L_{operation}}{1000} \quad (Equation\ 16)$$

In which

Parameter	Explanantion	Unit
RC	Amount of charged refrigerant	kg
GWP	Global warming potential of refrigerant	
$L_{operation}$	Leakage rate of annual operation	%

GWP values and other $L_{installation}$, $L_{operation}$ rates in the above equation could be referred to the values in ***Appendix E - Emission factor***

Example: ***GHG emission from refrigerant***

Office X uses 10 same AC in total, each AC require full charge of 1.45 kg R410A. Among those, 5 AC were installed in year 2014 and 5 were in 2015. Therefore, the CO_2 emission for year 2015 from refrigerant includes:

• Emission from 5 newly installed AC (the applied leakage rate is 1.75% according to the Appendix VII:

Emission = (5 * 1.45) * 1725 * 1.75% /1000

= 0.2189 ton CO_{2e}

• Emission from using 10 AC (the applied leakage rate is 5.5% according to the Appendix VII):

Emission = (10 * 1.45) * 1725 * 5.5% /1000

= 1.376 ton CO_{2e}

Employees commuting

Equation for calculating GHG emission from employees commuting as below:

$$Emission = \sum \frac{KC_{ĐL,x} * EF_{means,x}}{1000} \quad (Equation\ 17)$$

In which

Para	Explanation	Unit
$KC_{ĐL,x}$	Average distance of employee commuting from transportation means type x	Km
$EF_{PTĐL,x}$	Emission factor of employee commuting from transportation means type x, including	
EF_{OT}	Emission factor when travelling by car	$kgCO_{2e}$/km/person
EF_{TX}	Emission factor when travelling by taxi	$kgCO_{2e}$/km/person
EF_{TH}	Emission factor when travelling by train	$kgCO_{2e}$/km/person
EF_{XM}	Emission factor when travelling by motorbike	$kgCO_{2e}$/km/person
EF_{XB}	Emission factor when travelling by bus	$kgCO_{2e}$/km/person
$EF_{XĐ}$	Emission factor when travelling by bike	$kgCO_{2e}$/km/person
$EF_{ĐB}$	Emission factor when walking	$kgCO_{2e}$/km/person

Values of parameters in the above equation as follow:

Table16: Emission factor from transportation means

Parameter	Value	Unit
EF_{OT}	0.19184	$kgCO_{2e}$/km
EF_{TX}	0.16286	$kgCO_{2e}$/km
$EF_{TĐ}$	0.01214	$kgCO_{2e}$/km
EF_{XM}	0.11978	$kgCO_{2e}$/km
EF_{XB}	0.10172	$kgCO_{2e}$/km
$EF_{XĐ}$	0.00000	$kgCO_{2e}$/km
$EF_{ĐB}$	0.00000	$kgCO_{2e}$/km

In order to estimate the average commuting distance from employees for each transportation means, office could use the survey form template in the attached together with this Guideline [30].

***Example:** GHG emission from employee commuting*

Office X has 10 staffs, among them, 8 staffs travel by motorbike to work, 1 travels by car and 1 travel by bicycle. After delivering and collect information from the survey form, the CO_2 emission is calculated as below:

Means of transporation	Travel distance (km)	Number of working days during reporting period (days)	Emission factor (tCO_2/km/person)	Emission (ton of CO_{2e})
A	B	C	D	E = B*2*C*D/1000
Motorbike 1	10	220	0.11987	0.527
Motorbike 2	15	220	0.11978	0.791
Motorbike 3	8	220	0.11978	0.422
Motorbike 4	9	220	0.11978	0.474
Motorbike 5	6	220	0.11978	0.316
Motorbike 6	7	220	0.11978	0.369
Motorbike 7	4	220	0.11978	0.211
Motorbike 8	6	220	0.11978	0.316
Car	15	220	0.19104	1.266
Bike	3	220	0.00000	0.000
Total				**4.692**

The selected indicators must be monitored following the below tables:

Emissions from petrol and oil consumption

No.		Monitoring indicator 10
Indicator		C_{NL}
Unit		litre
Description		Petrol and oil consumption
Data source		Purchasing/Account Department
Monitoring procedure	Method	Aggregate from invoices
	Frequency	Monthly
Other information (if any)		

Emission from refrigerant

No.		Monitoring indicator 11
Indicator		*RC*
Unit		Kg
Description		Amount of charged LPG
Data source		Purchasing/Accounting department
Monitoring procedure	Method	Aggregate from invoices
	Frequenct	Monthly
Other information (if any)		

30 Templates and documents could be downloaded from the following address: bit.ly/TailieuVanphongXanh

Emission from Liquid Petroleum Gas (LPG)

No.		Monitoring indicator 12
Indicator		N_{LPG}
Unit		Cylinder
Description		Number of LPG cylinder
Data source		Purchasing/Accounting Department
Monitoring procedure	Method	Aggregate from invoices
	Frequency	Monthly
Other information (if any)		

No.		Monitoring indicator 13
Indicator		m_{LPG}
Unit		Cylinder
Description		Average weight of LPG cylinder
Data source		Purchasing/Accounting Department
Monitoring procedure	Method	Aggregate from invoices
	Frequency	Yearly
Thông tin khác (nếu có)		

Emissions from employees' daily commutes

No.		Monitoring indicator 14
Indicator		$KC_{CT,x}$
Unit		Km
Mô tả		Travel distances by means Car Taxi Metro Motorbike Bicycle Bus Walking
Data source		HR and Admin Depart-ment
Monitoring procedure	Method	Staff survey
	Frequency	Quarterly
Other information (if any)		

E - EMISSION FACTORS

Using refrigerant

Table 17: Default factor of average refrigerant loading and leakage [31]

Application	Charge (Kg)	Lifetime (Year)	Emission rate (% of charged amount)		
			Assembly	Operation	Recover rate
Refrigeration	0.05 - 0.5	12 - 15	0.6 %	0.3%	70%
Stand-Alone Commercial Applications	0.2 - 6	8 - 12	1.75%	5.5%	70 - 80%
Medium and Large Commercial refrigeration	50 - 2000	7 - 10	1.75%	20%	80 - 90%
Transport Refrigeration	3.0 - 8.0	6 - 9	0.6%	32.5%	70 - 80%
Industrial Refrigeration including Food Processing and Cold Storage	10 - 10000	10 - 20	1.75%	16%	80 - 90%
Chillers	10.0 - 2000	10 - 30	0.6%	8.5%	80 - 95%
Residential and Commercial A/C, including Heat Pumps	0.5 - 100	10 - 15	0.6%	3%	70 - 80%
Mobile Air Conditioners		12	0.50%	15%	0%

31 GHG Protocol HFC Tool (Version 1.0)

Global warming potential (GWP) of GHG

The table below sets forth the GWPs for a 100-year period of different GHGs provided by the Intergovernmental Panel on Climate Change (IPCC) in the 1996 reporting manual on GHG emissions.

Table 18: GHG potential global warmingu

GHG type	Chemical component	GWP
Carbon dioxit	CO_2	1
Metan	CH_4	21
Dinitơ oxit	N_2O	310
Hydrofluorocarbon (HFGs)		
HFC-23	CHF_3	11 700
HFC-32	CH_2F_2	650
HFC-41	CH_3F	150
HFC-43-10mee	$C_5H_2F_{10}$	1 300
HFC-125	C_2HF_5	2 800
HFC-134	$C_2H_2F_4$ (CHF_2CHF_2)	1 000
HFC-134a	$C_2H_2F_4$(CH_2FCH_3)	1 300
HFC-143	$C_2H_3F_3$ (CHF_2CH_2F)	300
HFC-143a	$C_2H_3F_3$ (CF_3CH_3)	3 800
HFC-152a	$C_2H_4F_2$ (CH_3CHF_2)	140
HFC-227ea	C_3HF_7	2 900
HFC-236fa	$C_3H_2F_6$	6 300
HFC-245ca	$C_3H_3F_5$	560
Hydrofluoroete (HFEs)		
HFE-7 100	$C_4F_9OCH_3$	500
HFE-7 200	$C_4F_9OC_2H_5$	100
Perfluorocarbon (PFGs)		
Perfluorometan (tetrafluorometan)	CF_4	6 500
Perfluoroetan (hexafluoroetan)	C_2F_6	9 200
Perfluoropropan	C_3F_8	7 000
Perfluorobutan	C_4F_{10}	7 000
Perfluorocyclobutan	c-C_4F_{18}	8 700
Perfluoropentan	C_5F_{12}	7 500
Perfluorohexan	C_6F_{14}	7 400
Sulfur hexafluorit	SF_6	23 900

For other GHG, please refer to https://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

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Guideline on Green Office Criteria and Lifestyles
Version 2.0

Authors: MS. Hoàng Thanh Hà - MS. Phạm Thị Thuỳ Dương
Cộng sự: MS. Nguyễn Thị Bích Hoà - MS. Tạ Hương Thu - Nguyễn Thị Phương Nhung

Initiative "Upscale and Mainstream Green Office Lifestyles in Vietnam"
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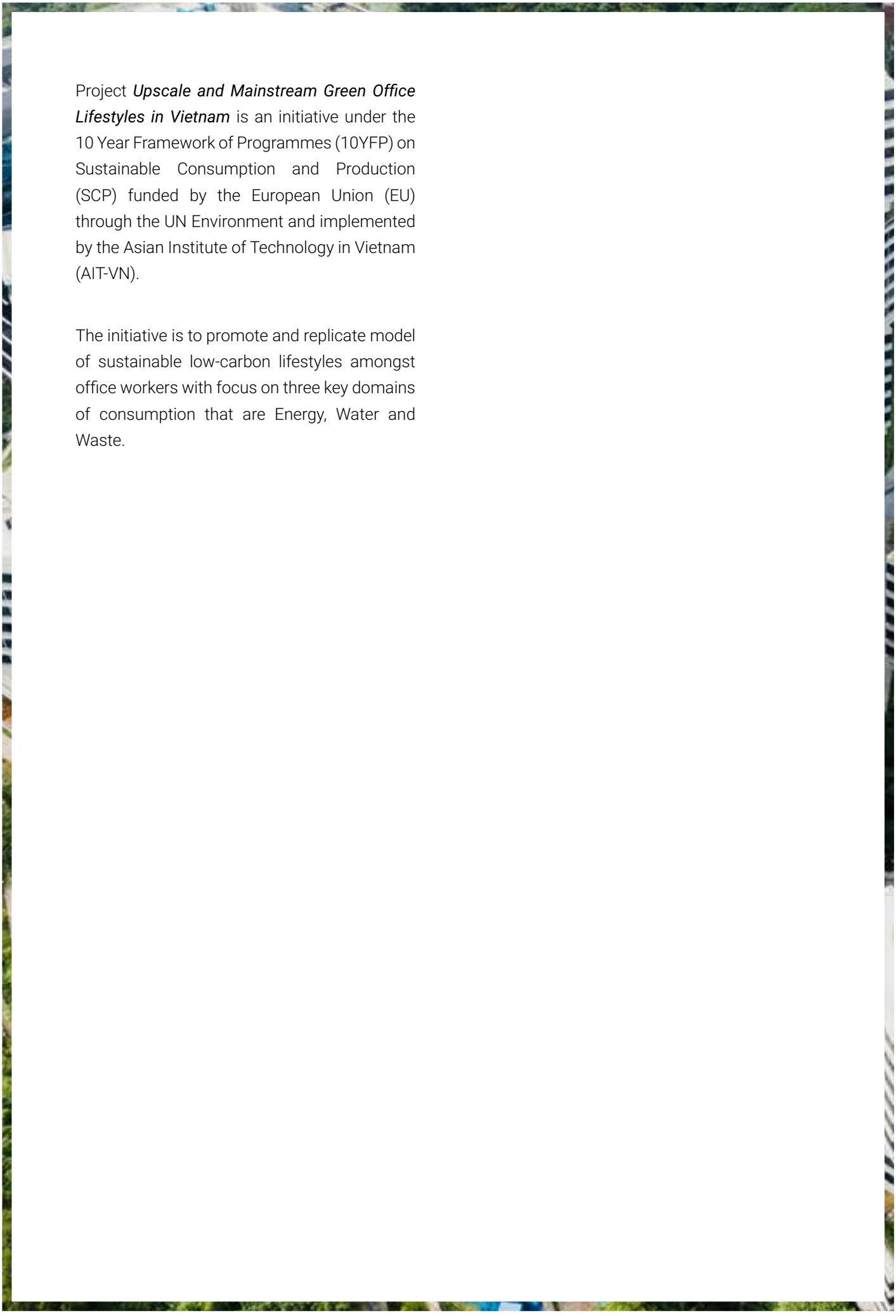
Contact information: Green Office Program
greenoffice.aitcv@gmail.com | +84 904 0099 85
www.green-inno.vn/van-phong-xanh | fb.com/greenofficevietnam



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The initiative is to promote and replicate model of sustainable low-carbon lifestyles amongst office workers with focus on three key domains of consumption that are Energy, Water and Waste.