



Walk & Bike Society in KMUTT THAILAND

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Abstract. KMUTT committed to be Green and sustainable university for SDGs 2030 since 2018 and committed to be a part of society that is a major force in promotion and implementation on walk and bike society within the university and expand to communities surrounded. To support walk & bike society in campus, walk & bike master plan has been designed with bike lane, pedestrian cover way, bicycle share services, bicycle repair center and "Zombike" activities which all students and staff make their own bicycle for free by using bicycle accessories from old bicycle in campus. KMUTT Walk & Bike Society policy has been launched since 2018 with bike riding activities which help to support sustainable transportation goal comply to SDG 3: Good Health and Well-being; SDG 7: Affordable and Clean Energy; SDG 11: Sustainable cities and communities and SDG13: Climate Action. The results from 5 years implementation (2018-2022) showed 75% of students and staff walking daily which can make 20,250,000 Km per 5 years in our campus. Bike activities showed daily use and 228 bicycle riding activities in total of 2,008,995 Km distance, initiated by 650 Green heart's students and 48,720 people from students, staff and communities participated on these activities. The results showed these walking and riding activities help to reduce carbon emission 3,188 tCO₂ and reduce Diesel usage 1.59 million L. KMUTT walk & bike society help to initiate KMUTT sustainable leadership, make Green Heart 's students and change agents for helping communities and society expand the sustainable mobility to make healthy and low carbon society, and sustainability for all.

Keywords:

Sustainable Transportation, Walk & Bike Society, Green Heart's Student, Sustainable Leaderships, Low Carbon Society, Healthy Society

1. Introduction

King Mongkut's University of Technology Thonburi (KMUTT) is one of Science and Technology university in Thailand which committed to be sustainable university which comply the global and national sustainable agenda. Sustainability is one of the major challenges of current and future generation of students & staff. KMUTT determines to develop process

from policy to student’s Green Heart for Sustainability by using education, research, and social services based on goals of SDGs 2030 in producing green-hearted students who will become the social change agents to apply their knowledge and skills to create an impact at societal, national, and global levels as shown in **Figure 1**. KMUTT committed to be Green University for SDGs 2030 with walk and bike society initiation. To promote sustainable mobility with healthy campaign which comply to SDG Goal 3, Goal 7, Goal11, Goal13 and Goal17, KMUTT Walk & Bike Society policy has been launched since 2018. Walking and bike riding activities have been promoted along with campus walk & bike master plan including bike lane and pedestrian cover way and free of charge for all bicycle activities and services including bicycle share services, bicycle repair centre , “Zombike” making your own bicycle from reused bicycle accessories. Bicycle riding activities have been initiate by student’s Green Heart from KMUTT Green bike club for 50 bicycle trips per year with short trip surround communities and long trip with bicycle clubs and bicycle networking such as Bike Friday, Saturday Ride Fever, KMUTT Bangmod-Bangkhunthien Traditional bike trip , Car Free day , Bangkok-Huahin Long bicycle Trip, Bangmod-Rachaburi Bicycle Trip and others bicycle events. The purpose of this study is to share our experience on promoting sustainable mobility with healthy campaign within KMUTT by using bicycle and walking as a tool and expand bicycle activities to community by student’s Green Heart.

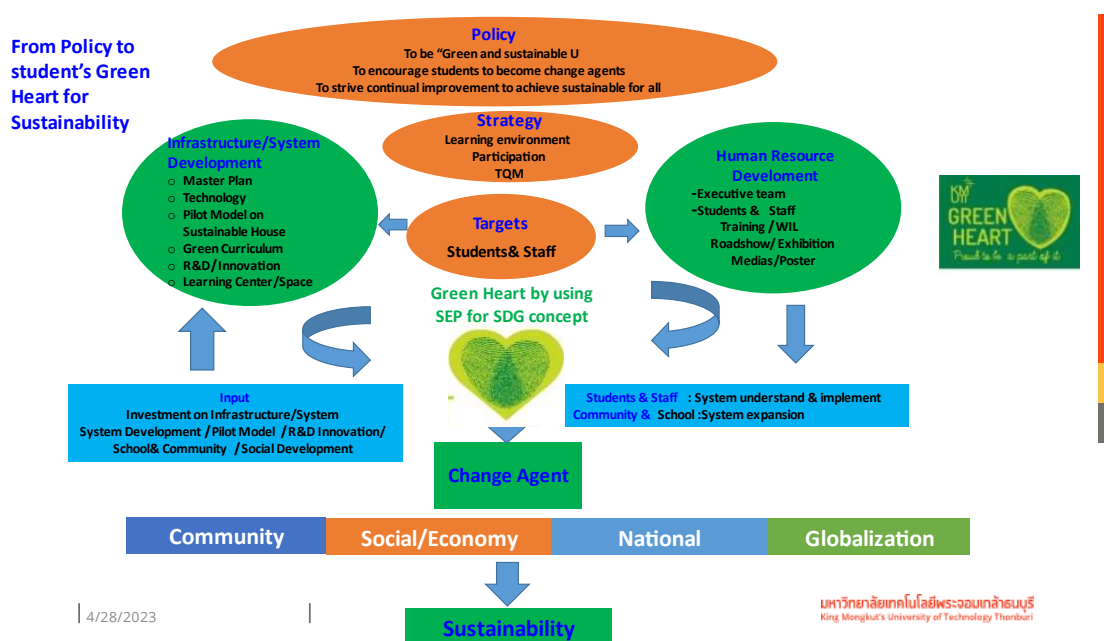


Figure 1. KMUTT Process: From policy to student’s Green Heart for Sustainability

2. Points of Results and Discussions

KMUTT has been provided Sustainable transportation policy since 2018 and run one of the most comprehensive programs” KMUTT Walk and Bike Society” to reduce university-related traffic impacts which is an essential part of our drive for sustainability. The results from 5 years implementation (2018-2022) on KMUTT Walk & Bike Society policy focus on two main activities, the first one is the promotion activities to make walk and bike society within KMUTT campus and the second one is the expansion on bicycle riding activities to community and bicycle network surround.

2.1. Promotion of KMUTT Walk & Bike society within KMUTT campus.

KMUTT provide Sustainable transportation policy which focus on walk and bike society by supporting infrastructure and Master plan for walking path & bike lane, built environment within campus to promote walking and riding bicycle, free bicycle services including bicycle share services, bicycle repair centre, “Zombike” activities which all students and staff make their own bicycle by themselves for free by using bicycle accessories from old bicycle in campus, pedestrian promotion which encourage a healthier environment for students and staff to walk around campus as shown in **Figure 2**. Moreover, walk and riding bicycle in campus help to support the declaration of Intent “KMUTT’s race to carbon neutrality by 2040” and KMUTT Carbon neutrality policy for carbon emissions reduction, fuel costs reduction with more environmentally friendly as shown in **Figure 3**. The results for 5 years implementation (2018-2022) showed 80 %completion of supported infrastructure for Walk and Bike Master plan including bike lane, walking path and cover way along with Green Society Building which is the one stop services for bicycle including Bike share services, Bike repairing centre and “Zombike” activities For bicycle services, the 5 years implementation results showed Bike share system provided 109,200 services with average distance 5.2 km per service. The “Zombike” activities showed KMUTT students and staff made their own 285 bicycles during 2018-2022 and use their bicycle for daily transportation. Moreover, KMUTT students and staff have their own bicycle in average 1,020 bicycle per year and use for daily transportation with average 11.8 Km/day. Total distance for 5 years of Bike share services and daily riding in campus were 567,840 Km and 76,995 Km, respectively as shown in **Table 1**.



Figure 2. Promotion of KMUTT Walk & Bike society within KMUTT campus.

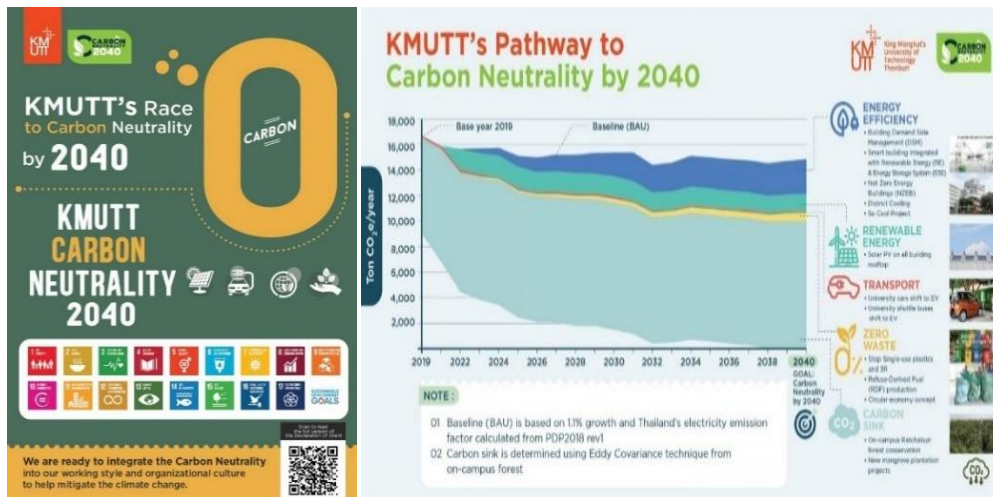


Figure 3. KMUTT's Race and Pathway to Carbon Neutrality by 2040

2.2. Bike riding activities for expansion to community

Bike riding activities for Bike society expansion to community have been initiated by student's Green Heart from KMUTT Green bike club for 50 bicycle trips per year. Bike riding activities separated into short trip for the trip not more than 40 kilometres and long trip for the trip more than 40 kilometres from university campus. Our short trip activities are mainly riding to surrounded communities such as Bike Friday, Saturday Ride Fever, Car Free day and KMUTT Bangmod-Bangkhunthien Traditional bike trip. Our long trip activities are mainly riding as traditional bike trip with KMUTT bicycle clubs and others bicycle networking such as Bangkok-Huahin Long Bicycle Trip, Bangmod-Rachaburi Bicycle Trip as some activities shown in **Figure 4**. The results for 5 years implementation on bike riding activities (2018-2022) showed 228 bike riding activities with 204 short trip and 24 long trips with no bike riding trip during covid -19 pandemic in 2020-2021. The 5 years bike riding activities initiated by 650 Green heart 's students with 48,720 people from students, staff and communities participated on these activities in total distance 1,364,160 Km in 5 years with 86,800 Km from Bike Friday, 89,200 Km from Saturday Ride Fever, 112,784 Km from Car Free Day, 310,211 Km from KMUTT Bangmod-Bangkhunthien Traditional bike trip, 724,546 Km from Bangkok-Huahin Long Bicycle Trip and 40,619 Km from Bangmod-Rachaburi Bicycle Trip as shown in **Table 1**.

Bike riding activities for expansion to community



Figure 4. Bike riding activities for expansion to community

2.3. Walking campus at KMUTT

KMUTT has the longest distance 2.7 km for transportation in KMUTT main campus. The appropriated transportation system in KMUTT is walking and bicycle usage. The results from the transportation survey in KMUTT (2019) showed 75 % of students and staff in average of 13,500 people use walking for daily transportation with average 2 km per day. The results of 5 years for walking within campus exclude Covid -19 pandemic showed total distance for walking 20,250,000 Km per 5 years of implementation as shown in Table1.

Table 1. Walking And Riding Activities in KMUTT During 2018-2022 Help To Reduce Carbon Emission (GHS) And Diesel Usage.

Walk & Bike Activities (2018-2022)	Distances (Km)	Equal to Diesel Usage (L) 14 Km/L of Diesel	KgCO ₂ e From Diesel http://thaicarbonlabel.teo.or.th/admi/uploadfiles/emission/ts_578cd2cb78.pdf	GHG reduction (KgCO ₂ e) 67% from bike activities 75% from walk activities	GHG reduction (tCO ₂ e)
Bike share services	567,840	40,560.00	109,512.00	73,373.04	73.37
KMUTT students and staff have their own bicycle	76,995	5,499.64	14,849.04	9,948.85	9.95
- Bike Friday	86,800	6,200.00	16,740.00	11,215.80	11.22
- Saturday Ride Fever	89,200	6,371.43	17,202.86	11,525.91	11.53
- Car Free day	112,784	8,056.00	21,751.20	14,573.30	14.57
- KMUTT Bangmod-Bangkhunthien Traditional bike trip	310,211	22,157.93	59,826.41	40,083.69	40.08
- Bangkok-Huahin Long bicycle Trip	724,546	51,753.29	139,733.87	93,621.69	93.62
- Bangmod-Rachaburi Bicycle Trip	40,619	2,901.36	7,833.66	5,248.56	5.25
Total Bike activity	2,008,995	143,499.64	387,449.04	259,590.85	259.59
Walk activities	20,250,000	1,446,428.57	3,905,357.14	2,929,017.86	2,929.02
results	22,258,995	1,589,928	4,292,806	3,188,609	3,443

2.4. Output Outcome Impact and Lesson learnt from the Implementation of Walk and Bike Society

The output from 5 years (2018-2022) implementation of Walk and Bike Society in KMUTT showed the total distance 22,258,995 Km from Walk & Bike activities as shown in **Table 1**. With 2,008,995 Km from Bike activities and 20,250,000 Km from Walk activities. The results also showed the bike riding activities within campus in the distance of 644,835 Km which come from 109,200 bike share services in the distance of 567,840 Km and the daily use of 1,305 bicycle with average 11.8 Km/day in the distance of 76,995 Km. And the bike riding activities for expansion to community showed total distance of 1,364,160 Km from 228 bike riding activities with 48,720 people joined for 28 Km average riding distance per person. Walk activities in campus for 5 years implementation from 75 % of student and staff were 20,250,000 Km. The calculation of carbon emission reduction or GHG reduction from walking and bicycle riding activities have been done by using the criteria of 67 % carbon reduction from bike activities compared to transportation by car [4] and 75% carbon emission reduction from walking compared to car driving [5]. The outcome and impacts from the 5 years (2018-2022) implementation of walk and bike society in KMUTT showed the reduction of carbon emission 3,188 tCO₂ and 1.59 million L. of Diesel usage reduction. The lesson learnt from the implementation of KMUTT walk & bike society showed the key role of student engagement with key drivers are Green Heart initiation with nudge in Action and people participation concept.

3. Conclusion

The results from 5 years (2018-2022) implementation of Walk & Bike Society in KMUTT showed the achievement of sustainable transportation come from the top management commitment with policy and infrastructure supporting along with participation from students and staff for implementing activities. The results achieved with more than 75% of students and staff join our activities which can help to reduce carbon emission 3,188 tCO₂ and reduce Diesel usage 1.59 million L. Moreover, KMUTT walk & bike society help to make healthy community along with initiate KMUTT sustainable leadership, make Green Heart 's students and change agents for helping communities and society. The expansion of walk and bike society to community and initiate community engagement is now in the ongoing process to make the sustainable mobility with healthy and low carbon society for all in KMUTT and community surround.

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