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Drivers and Barriers of Mainstreaming the Low-Carbon City Policy in Urban Local Authorities

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Low Carbon Society concept



- A Low Carbon Society LCS is defined as a society where people release GHG in amounts that the nature can absorb them (MOEJ, 2007).
- Among various kinds of GHG mitigation methods, the LCS approach is a holistic idea that calls for behavioral changes to emit less GHG.

The Urban Focus of Low Carbon Society concept



- The notion of LCS is particularly relevant for urban areas which are the **major sources of GHG emission**.
 - The local government bodies which manage urban areas have a leadership role to play in **transforming urban societies to low carbon societies**.
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why local government should be the level of intervention to adopt the LCS concept

- Cities are major sources of GHG emission
 - Cities have the authority delegated by the state to adopt legislative measures and implement specific actions
 - Local government bodies can resolve socio-economic and environmental problems more effectively
 - the achievement of a national goal like LCS is not possible unless the stakeholders at the local level adopt the goal to make it their own
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Four major pathways that can bring about to accomplish the goal of LCS

1. Changing people's lifestyles towards sustainable consumption of resources and emission reduction
2. Utilizing renewable energy and energy efficient devices and technologies
3. Expanding green areas as carbon sinks, and
4. Mainstreaming the notion of LCS in the overall urban developmental policy



Research Focus

- Local government bodies have inherent problems that affect the implementation of national goals through local actions.
 - This presentation discusses the drivers and barriers that affect the local government bodies in achieving the goal of LCS.
 - The presentation is based on a research project conducted in a set of secondary level municipalities in Thailand
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Actions towards LCS in Thai Municipalities

- Local government bodies have been promoting the LCS concept since 2009 (EPPO, 2010).
 - ✓ Projects that follow the 3R principle such as energy saving and composting are common.
 - ✓ Use of cleaner fuel for vehicles and energy efficient stoves
 - ✓ City greening projects
 - Implementation of these projects is limited to some communities, organizations or schools
 - Rarely implemented in the whole municipality (NMT, 2008).
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why the actions are not replicated and up-scaled by most of the local government bodies

- LCS concept has been mainstreamed in the national development policies and implemented in the locally governed areas in Japan & France.
 - They have **competence and capacity** to put the LCS concept into practical actions.
 - Applying the LCS concept in the locally governed areas in developing countries like Thailand is a daunting task
 - **Lack of drivers on one hand and a plethora of barriers on the other.**
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Drivers

Internal Factors:

1. The directives/commands of the national governments (e.g., policy directives)
2. Monetary or non-monetary incentives from the higher authorities (e.g., Grant, technology transfer)
3. Competition among local government bodies for awards/recognition (e.g., Adipura awards)

External Factors:

1. Improving the image of the city
 2. Visionary leadership of the local government
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Barriers

Internal

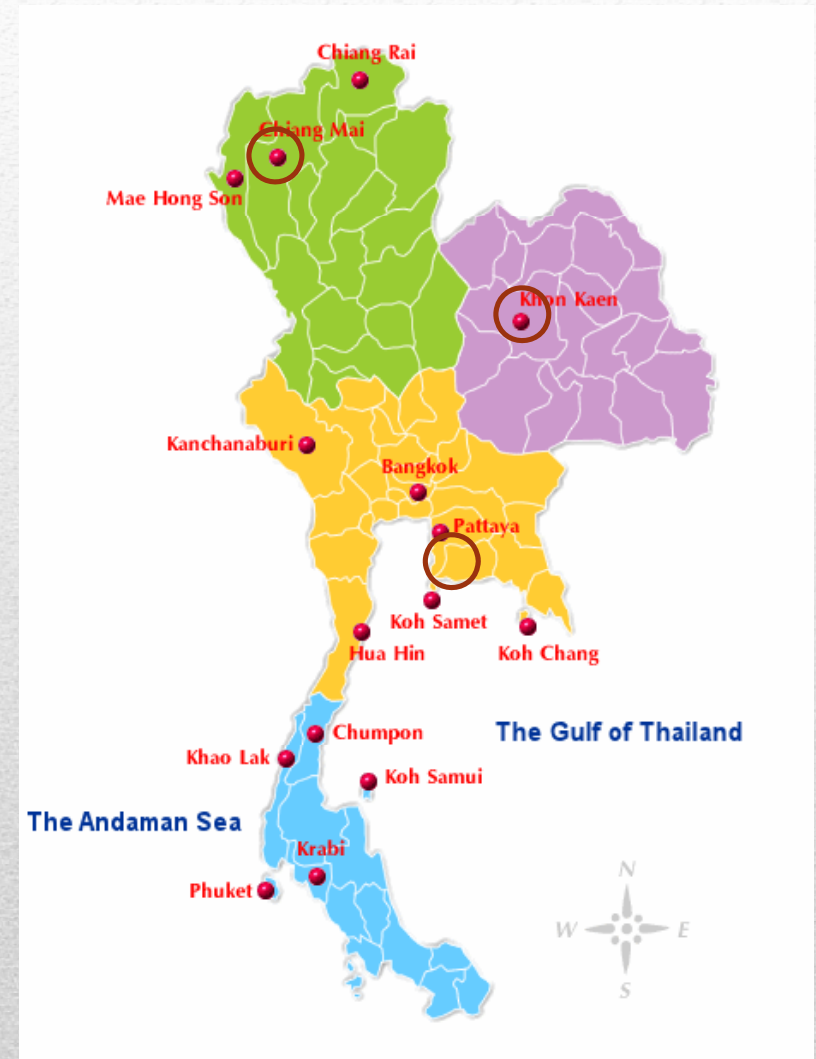
- Financial barriers
- Technological barriers
- Organizational barriers
- Managerial barriers

External

- Lack of institutional support
 - Lack of social support
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Study Areas

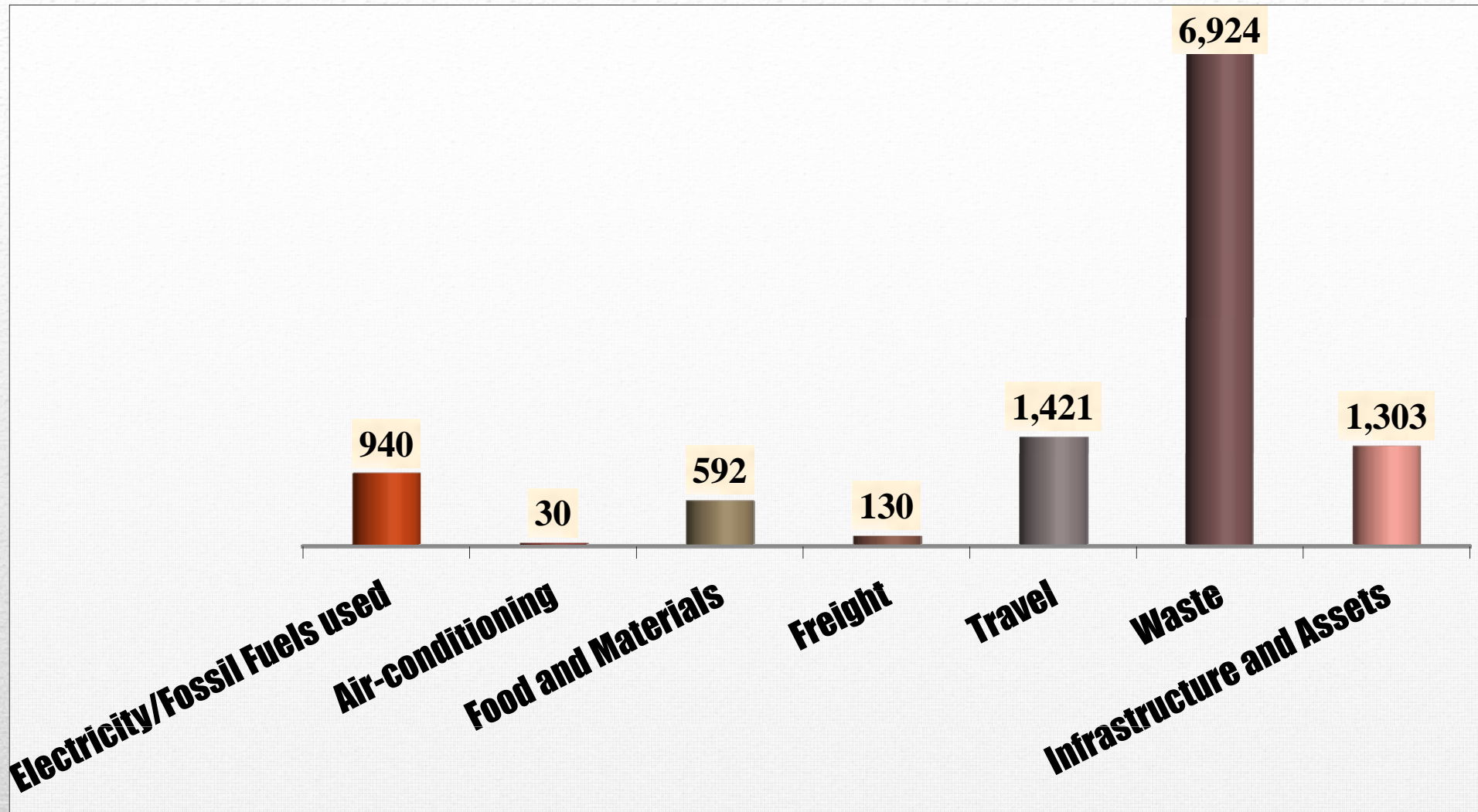
- Rayong municipality (RYM) in the Eastern Region
- Khon Kean municipality (KKM) in North-East Region
- Chiang Mai municipality (CMM) in the Northern region;
- 110 key informants were drawn from the three municipalities (36 from RYM, 36 from KKM and 38 from CMM).



Strategic thrust	Rayong Municipality (RYM)	Khon Khen Municipality (KKM)	Chiang Mai Municipality (CMM)
1. Changing people's lifestyle towards resources conservation and emission reduction	<ul style="list-style-type: none"> ● Promotion of energy conservation in households and businesses ● Climate change mitigation and adaptation campaign ● Air pollution and waste water pollution reduction ● 3R campaign 	<ul style="list-style-type: none"> ● Promotion of organic waste separation at source ● 3R campaign ● Community level composting projects 	<ul style="list-style-type: none"> ● City-wide energy conservation campaign ● Air pollution control from vehicles, households, SMEs and tourism businesses ● Community level composting projects

Strategic thrust	Rayong Municipality (RYM)	Khon Khen Municipality (KKM)	Chiang Mai Municipality (CMM)
2. Utilizing renewable energy and energy efficient appliances and processes	<ul style="list-style-type: none"> • Applying gasification technology (waste to energy) and polymer technology (turning plastic waste to synthetic oil) • Promoting renewable energy and efficient appliances among SMEs • Fixing cleaner devices and improving energy saving practices in the vehicle fleet of the municipality • Bicycle lane project • Energy efficiency in municipal buildings 	<ul style="list-style-type: none"> • Applying polymer energy technology to convert plastic waste to synthetic oil • Bio-gas production using organic waste to use as fuel in the kitchens of municipal schools • Improve the city-wide public transportation system 	<ul style="list-style-type: none"> • Bio-diesel production using used cooking oil • Energy efficiency improvement in the tourism sector • Pilot project on public transportation targeting energy-environment co-benefits

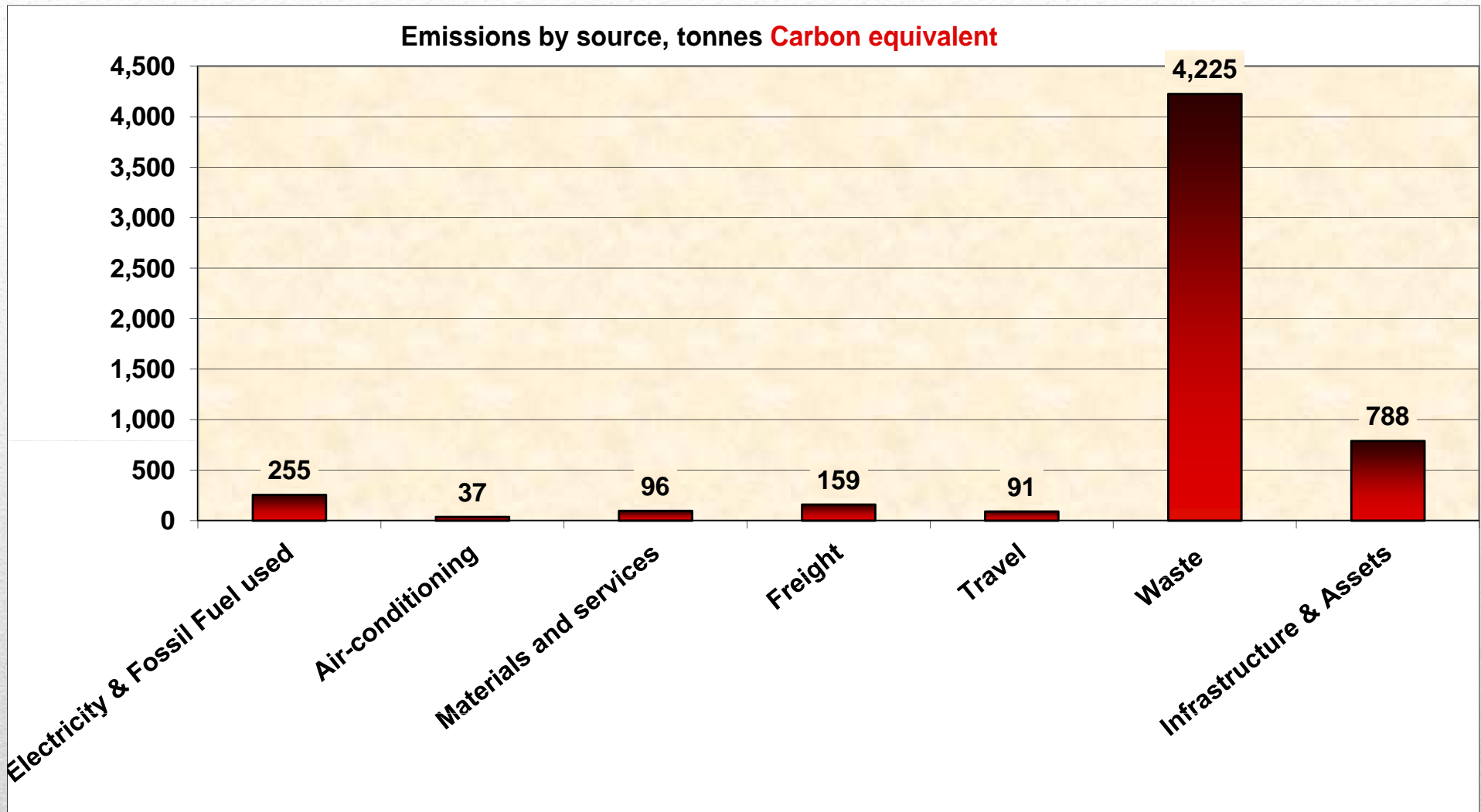
Strategic thrust	Rayong Municipality (RYM)	Khon Khen Municipality (KKM)	Chiang Mai Municipality (CMM)
3. Maintaining and expanding green areas	<ul style="list-style-type: none"> Expanding public green areas, especially the mangrove area 	<ul style="list-style-type: none"> Expanding public green areas at two levels (i.e., city and communities) 	<ul style="list-style-type: none"> Conservation and new planting of trees
4. Mainstreaming LCS concept in the urban development policy	<ul style="list-style-type: none"> GHG emission assessment of development sectors and municipal areas Recognizing overall emission reduction and environmental quality improvement as a thrust in the Strategic Plan 	<ul style="list-style-type: none"> Recognizing overall emission reduction and environmental quality improvement as a thrust in the Strategic Plan 	<ul style="list-style-type: none"> GHG emission assessment of major development sectors such as tourism, transport and trade



Comparison of GHG emissions in Rayong municipality
(ton of carbon equivalent in 2011)

Rayong Municipality's activities are rightly focused on waste management

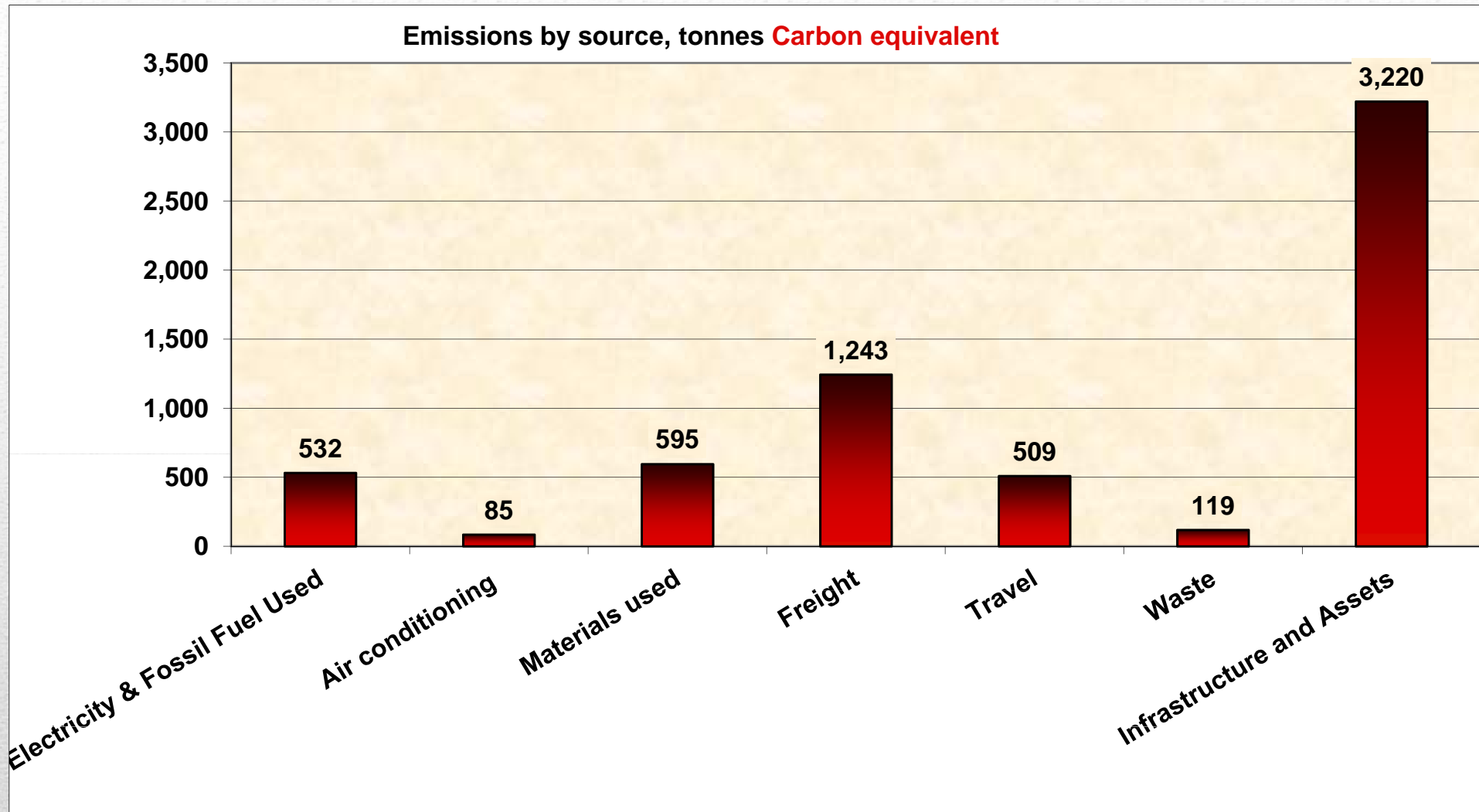
The main reason behind these activities is; **demonstrating good environmental governance**



**Comparison of GHG emissions in Khon Kean Municipality
(ton of carbon equivalent in 2011)**

Khon Kean Municipality's activities are rightly focused on waste management

The main reason behind these activities is; **improvement of the environmental quality**



**Comparison of GHG emissions in Chiang Mai Municipality (its own assets)
(ton of carbon equivalent in 2011)**

Chiang Mai Municipality's activities are not particularly focused on any sub-sector

The main reason behind these activities is; **improving the image of the city as a tourist destination**

Drivers	Weighted Average Index (WAI)		
	RYM (n ₁ =36)	KKM (n ₂ =36)	CMM (n ₃ =38)
• Technology transfer by a national/international development agency	.6387 ^a	.6313 ^a	.4706 ^b
• Visionary political leadership of the local government body to improve image of the city	.5935 ^a	.5125 ^b	.5765 ^{ab}
• Competitions launched by public/private agencies to reward clean and green communities	.5935 ^a	.5125 ^b	.5529 ^{ab}
• Dynamic leadership of community leaders and endogenous initiatives	.5806 ^a	.4937 ^b	.5353 ^{ab}
• Availability of financial incentives to invest on cleaner technologies and infrastructure	.5613 ^a	.5625 ^a	.4824 ^b
• The policy directives and guidelines issued by government agencies.	.5613 ^a	.4938 ^b	.5471 ^{ab}

Notes: Weighted Average Index (WAI): 0 – 0.20 = very low; 0.21 – 0.40 = low; 0.41 – 0.60 = moderate; 0.61 – 0.80 = high; 0.81 – 1 = very high

WAI values in the same row with superscripts ‘a’ and ‘b’ indicate that the respective WAI values are significantly different (p value < 0.05) according to pair-wise comparison using one-way ANOVA test and LSD’s test. That means, WAI values with superscripts a and ab; b and ab; a and a; b and b are not significantly different.

Barriers	RYM (WAI)	KKM (WAI)	CMM (WAI)
Financial barriers			
• Insufficient budget to procure modern technology and energy efficient devices	.8250	.8100	.8714
• No financial incentive policy from the central government to support municipality to launch projects that have high investment cost	.6375 ^a	.6400 ^a	.7143 ^b
Managerial barriers			
• Insufficient information management for officials to implement the activities relevant with LCS	.6750	.7100	.6571
• No internal policy for officials to formulate and implement activities of LCS	.6500 ^a	.7600 ^b	.7571 ^{ab}
• Insufficient participation among divisions inside municipal office	.6750	.7100 ^a	.6857 ^b

Government has given a directive but there is no enabling policy to drive municipalities to implement LCS activities

Variables	RYM (WAI)	KKM (WAI)	CMM (WAI)
Social barriers			
• Local politician pay less attention (political determination) the activities relevant with LCS**	.6125 ^a	.7300 ^b	.6571 ^{ab}
• Community leader pay less attention to encourage people to follow activities of LCS**	.6250 ^a	.7200 ^b	.6857 ^{ab}
• People pay more attention on other issues (income, culture) than the activities relevant with LCS	.6875	.7500	.7571
• People have negative thinking on the activities relevant with LCS because it can disturb their life style (turn off air condition, use less vehicle)	.6250	.7000	.6571
• Insufficient participation from people and other stakeholders**	.6125 ^a	.7100 ^b	.6857 ^{ab}

Changing people's consumption behavior is a major barrier to overcome, although people are interested in environmental quality improvement activities

Variables	RYM (WAI)	KKM (WAI)	CMM (WAI)
Technological barriers			
• Unavailability to access to energy efficient appliances and advanced technologies**	.6000 ^a	.6300 ^a	.7286 ^b
• Insufficient knowledge and skill to maintain advanced technological machines	.6875	.6600	.7143
• Inadequate experience in using advanced technological machines	.5875	.6000	.6286

Notes: Weighted Average Index (WAI): 0 – 0.20 = very low; 0.21 – 0.40 = low; 0.41 – 0.60 = moderate; 0.61 – 0.80 = high; 0.81 – 1 = very high

WAI values in the same row with superscripts ‘a’ and ‘b’ indicate that the respective WAI values are significantly different (p value < 0.05) according to pair-wise comparison using one-way ANOVA test and LSD’s test. That means, WAI values with superscripts a and ab; b and ab; a and a; b and b are not significantly different.

Technology is not a barrier in Rayong because several externally funded projects have been implemented there-in, whereas it is a barrier in Chiangmai

Concluding Remarks

- Local governments and their stakeholders priority is to implement environmental improvement projects
 - Some of them are having potential for carbon emission reduction
 - Currently implemented activities are not directly targeted at carbon emission reduction. Local governments are more concerned about quality of life improvement
 - Instead of direct approach for carbon emission reduction the co-benefit approach should be promoted with tangible incentives
 - Without overcoming the financial, managerial social, and technological barriers, even the co-benefit oriented activities can remain as pilot/demonstration projects
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