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Research paper

Sustainability Contextualized in Malaysia

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Abstract

Achieving sustainability has been the ultimate goal for many individuals, communities and nations. Yet all these stakeholders represent micro to macro level of the global community. Progression to decipher sustainability differs from macro all the way down to micro level. The overview on sustainability helps draw the spectrum of evaluation diversity. Many initiatives failed due to unmatched needs. Some of the initiatives that are successful are mainly biased towards a spectrum of the holistic sustainability needs. Intention of the paper is to publish the life cycle of ASEAN Energy Management Scheme (AEMAS) a macro strategy implemented through the micro level of deployment, complete with appraisal. Amongst its ASEAN peers, Malaysia championed the AEMAS program as essential micro building block towards the larger agenda of a low carbon city. The top down approach employing strategic government ministries and local policies drive the intention into reality making the 15th Session Conference of the Parties (COP15) commitment highly achievable. This analysis precedes both AEMAS and COP15 towards larger peripheries of LCC and COP21. The result will benefit all stakeholders such as the general public, academicians, government and policy makers who are working on sustainability topics.

Keywords: *AMEAS, LCC, Malaysia, sustainability*

1. Introduction

As the question, statement goes: People? Planet? Profit! Or People! Plant! Profit? Perhaps the answer may differ depending on stakeholders involved. With the institution of "our common future", more buy in from nations were seen through international climate change conferences but not without several acting fastidiously. As Malthus puts it cynically, "the advocate for action is precise to treat the speculative opportunist who preach up ardent benevolence and draw captivating pictures of a happier state of society only the better to enable them to destroy the present establishments and to forward their own deep-laid schemes of ambition, or as wild and mad-headed enthusiasts whose silly speculations and absurd paradoxes are not worthy the attention of any reasonable man. Certainly a strong reminder form the distant past for participating nations comprised of both developed and developing countries, thus the limit to growth sanction should be of an equal equilibrium.

9th April 2009 was the year Ministry of Energy, Green Technology and Water (KeTTHA) was established in Malaysia coincidently 40% carbon emission reduction commitment was made. This clearly shows the determination of the Malaysian Government to spearhead initiatives on power, green technology and water industries. The major shift through the green responsibility into KeTTHA was to plan, formulate policies and green technology programs as stated at http://www.kettha.gov.my

Malaysian Green Technology Corporation (MGTC) is the agency charged on catalyzing green technology deployment as a strategic engine for socio-economic growth in Malaysia in line with the National Green Technology Policy 2009. The initiatives were inclusive in nature. Besides putting emphasis on strengthening the local green technology industry and markets, MGTC has a mandate on developing human competency. On a larger picture, the agency is to create a conducive environment through financing and policies. With that profile, AEMAS fits perfectly hence MGTC spearhead through the odds and unprecedented goals required by the initiative. Through the policy, MGTC has been implementing unceasing energy efficiency and renewable energy awareness activities via structured and casual training [1] The budget allocated for the program was approximately Euro 212,380.55 for duration of four years. With project deliverables clearly defined as per table 1, the Malaysia chapter was esteemed successfully implemented. This paper will present the analysis from a macro perspective all the way down to the micro level using AEMAS as a case study. With the positive result it is then used to contribute to a larger local agenda of Low Carbon Cities.

Project Deliverables	
Micro level	Macro level
Appointment of two Country Experts	Establish Country Chapter
Conduct 20 energy manager's training courses	Establish National Support Network for Malaysia
Train 450 certified energy managers (CEM)	Organize AEMAS launching seminar
Certify 7 Professional Energy Managers (PEM)	Organize 2 annual conference for Malaysia
Train and Certify 20 local trainers	Certify 7 end-users
Certify 20 local auditors	

Figure 1: Project Deliverables

2. Deciphering Sustainability from Malthus to Montreal

Reverend Thomas Robert Malthus predicted that uptrend on population growth would lead to global food shortage was published in the 1700s in a book entitled "An Essay on the Principle of Population". Many scholars will have their respective opinion on the published material as things have changed. When the world's

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population hit seven billion and food supply remain vigilant was enough to prove the Malthusian theory obsolete. For the predicament of China becoming the largest producer of wheat [2]. Retrieved from http://www.countrydetail.com/top-10-largest-wheat-producing-countries-world/ with more than eighteen percent of the world's population as stated in http://www.worldometers.info/world-population/china-population/ was enough to the antithesis. Perhaps the hypothesis was relevant to that era due to lack of technology. Hence the topic of technology and more accurately appropriate technology will be discussed in another paper.

However the awareness that was seeded by Malthus managed to steer revolution three centuries later in the Club of Rome by prodding the unanimous pact for Limits to Growth. The compilations of others' works were by Paul Ehrlich's connection between human populations by exploiting the resources in the "Population Bomb". In 1972, Only One Earth by Rene Subos and Barbara Ward introduced the common enemy for the world to unite in order to create a common future.

Needless to say many global events transpired helps paved the way to the progress in sharing of a common future. Following are some highlights: 1973, Chipko Movement in India where women were empowered to influence environmental issues [3], 1977 Green Belt movement that cushioned desertification through tree planting, 1980 World Conservation Strategy to address inequities on social matters, 1980 Global 2000 report making biodiversity central as preserving as nicely put by Holmes Rolson saying "destroying species is like tearing pages out of an unread book, written in a language humans hardly know how to read, about the place where they live [4]. The green thought processes were being standardized by likeminded leaders through international networking conventions such as the 1982 World Resources Institute, UN charter for Nature, Third World Network and the Climate Change international conventions.

Prior to the Montreal Convention, catastrophic events also helps shapes the global movement into a common future. 1979 three Mile Island nuclear accident was a turning on human reliability [5], International debt crisis in 1982, Bhopal toxic chemical lean leaving 10,000 dead [6]. 1984 drought in Ethiopia and the most devastating nuclear disaster in Chernobyl power station that hit unprecedented radioactive contamination that effects are still observed 18 years later [7].

The combined push and pull factors paved way to the cornerstone of a global community in mitigating adverse stress to the planet. A sustainable development framework was shaped for the 1987 OECD Development Advisory committee to set environmental and developmental policies tackling the depleting Ozone layer. From the Brundtland Report entitled Our Common Future gathered the global communities towards the fundamental understanding of the building blocks of planet, people and profit [8, 9]. Nonetheless this was not the destination but a start of a new chapter towards a common goal by putting a name or face to the enemy and it is carbon dioxide at least pertaining to environment and economy.

2.1 Transnational to Asia and ASEAN

The Asia-Pacific region covers over 40 per cent of the planet's land area and is home to almost two thirds of the world's population. Recently, it has witnessed some of the world's fastest economic growth and, simultaneously, rapid rates of urbanization [10]. Asia has risen to become the largest manufacturing block in the world, driven by an estimated thirty million small and medium-sized enterprises (SMEs) making up about 80% of its industry [2]. Cities in Asia are growing at an unprecedented pace, with 44 million added to city populations every year 4 [11]. Some micro issues such as constant urbanization, waste management, pollution, security and associated health impacts remain key roadblocks in sustaining development. Across Asia, 95 projects were reported under the Fact Sheet Brochure Switch-ASIA program. In his forward message, Pierre Amilhat the Director for Asia, Central Asia, Middle East and Pacific Directorate-General for International European Commission says the program was able to accommodate the agenda in supporting sustainable consumption and production (SCP) to help build a reliable supply-chain community.

Over the past decade there have been many efforts in policy development to harmonize economic, environmental and social goals. Phase one of the program tackles fundamental aspects by assisting Asian SMEs to adopt cleaner technologies and practices through project grants, national and regional policy support components, and a dedicated network facility. After skills and knowledge transfer through the program many countries now have policy initiatives for material and energy efficiency, climate mitigation and investment in green sectors such as renewable energy, low-carbon buildings, eco-efficiency of heavy industry, and public transport.

Sustainable consumption and production (SCP) was the priority for EU in its 2007-2013 regional cooperation as tabulated in chart X. The ultimate goals of the European Commission's SWITCH-Asia program is to promote economic prosperity and help reduce poverty in Asia by encouraging a sustainable growth with low environmental impact from industries and consumers, in line with international environmental agreements and processes stated on the SWITCH-Asia website.

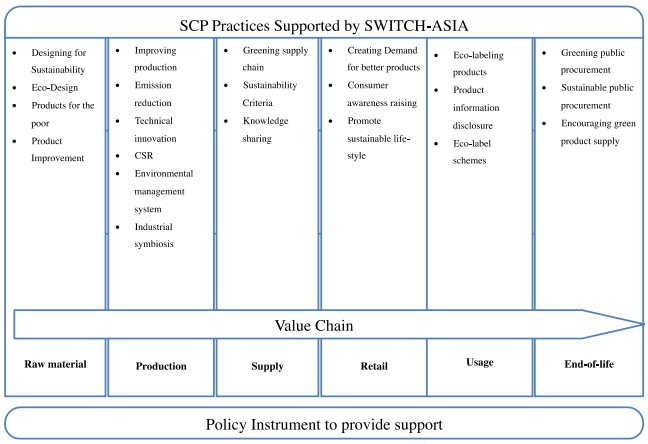


Figure 2: SCP value chain lifecycle

SCP under the SWITCH-Asia program within the Asian region were very much leaning on sustainable production has resulted in a number of good examples of how to apply the SCP amongst industry players. After the end of SWITCH-Asia Phase I, results were presented exhibiting significant benefits to ASEAN communities but some has failed to be replicated widely amongst the SMEs. The initiative that will be discussed is the energy efficient initiatives an ASEAN driven also brought about policy making to help bring implementation on a guided landscape.

3. ASEAN Energy Management Scheme (AEMAS)

In 2008, all were in unison to have skills transferred as their priority thus the inauguration of ASEAN Centre of Energy (ACE) with support form European Union on their SWITCH-ASIA program. The governing body ACE acts as the AEMAS provincial body to synchronize the collaborative efforts towards the achievement empowering the SMEs. The fundamental aim of the SWITCH-Asia "ASEAN Energy Manager Accreditation Scheme (AEMAS)" project was to reduce energy consumption from large and small medium industries. The objective is to reduce green-

house gas emissions within the ASEAN partner countries. The scheme envelops all 10 ASEAN countries. During the June 2010 ASEAN Summit in Vietnam, communities from the regional Ministers of Energy welcomed the scheme warmly. Procedures, techniques, rules and regulations have been thoroughly discussed, amongst others.

The first phase of the project was to up skill the ASEAN members through the AEMAS certified energy managers training program. In all countries, local participants were trained and certified by AEMAS country experts. Acknowledgment through certification of trained and qualified certified energy managers (CEM) are also accredited throughout the ASEAN region. This phase clearly made an impact on the social aspect of sustainability. The curriculum has a great amount of technical apparatuses with high emphasis on strategic aspects ensuring management level driven program. CEM will be given significance role within their workspace and be included into the decision-making circle. Trained professionals will have balanced technical, management and financial skills to carry out the program sustainably. Thus energy savings and efficient production processes became a natural result.

Upon adoption and implementation of a sustainable energy management system by CEM, energy-intensive industries or cooperation will be able to seek for certification. Naturally the organizations develop into phase two as CEMs enable their companies to attain AEMAS energy star accreditation. In effect creating a continuous certification process for both the individual and the organization. The initiative will stimulate demand to hire accredited energy manager for certification. It will be obtained only after demonstrating actual implementation of a sustainable energy management system and achievement of measurable energy savings hence it complements the ISO 50001 Energy Management Standard.

The measureable impact form SWITCH-Asia I through the AEMAS project was recently published in 2014 with impact numbers[12] as referred to figure 3 below. With these stunning results, it became a key driver to the ASEAN Plan of Action for Energy Cooperation's (APAEC 2010-2015) of reducing the region's energy intensity by 8% (based on 2005 level) by the year 2015[1]. Malaysia being one of the developing countries is actively contributing and currently benefiting form the combined effort in cutting down carbon emission. One key success factor agreed upon was by focusing on energy efficiency activities.

Europe-Asia Cooperation				
The project organised a workshop with European and Asian participants on energy efficiency and AEMAS.				
Target group Engagement	Policy Development	Economic Impact	Environmental Impact	Social Impact
Established six national councils (country chapters) in Indonesia, Malaysia, Myanmar, the Philippines, Thailand and Vietnam were established with a total membership of 74 organisations from both public and private sectors.	The project organised 12 conferences (1 international, 11 national) and 6 inception workshops.	Saved Php 1.6 million per year (equivalent to EUR 26 033).	Reduction of energy use by 3% or 186 000 KWh.	Increased awareness of energy efficiency among energy managers in ASEAN.
The project engaged with industry associations, equipment vendors, government agencies/ministries in charge of energy efficiency & conservation, advocacy groups, training institutes, professional organisations and academics.	Policy processes engaged in were advocacy, assistance in drafting and reviewing policies and promotion.	Increased the profit returned to capital expenditure for more energy efficient equipment.	The project promoted the switch to higher efficiency equipment and alternative renewable energy technologies.	Energy savings and lower electricity bills for households.
Type of project activities were training sessions and certification and standardisation events.	The project contributed in the amendments of existing Energy Efficiency & Conservation Laws in ASEAN countries.	New green products introduced to the market, e.g. inverter air conditioners using ozone-friendly refrigerant (R410A).	Reduction of carbon emission from 147 tonnes to 62 tonnes achieved by AEMAS-certified intensive energy end- users by the end of the project.	
		Measures carried out to enhance business awareness on climate change risks: Presentations at pertinent events.		

Figure 3: Measureable impact for SWITCH-Asia I

4. AEMAS Sustainability from Macro level to Micro level in Malaysia

Out of 95 developments under SIWTCH-Asia program, five projects covering four sectors were implemented in Malaysia as shown in figure 4. One of the key projects discussed in this paper is the AEMAS initiative targeting SMEs and utilities sector through service cum product design for sustainability.

Project Title	Sector	SCP Practice
AEMAS	Utilities Sector	Service and Product design for Sustainability
BIOMASS SP	Urtilities Sector	Waste Management
Clean Batik Initiatives	Textile and leather industry	Product design for Sustainability, Sustainable Supply Chain Management
Efficient Air Conditioner/ASEAN SHINE	Electrical Equipment Industry	Eco-labels, Product Design for Sustainability
Sustainable Building Materials - SuBuMa	Building Materials Industry	Eco-labels, Product Design for Sustainability

Figure 4: Measured results achieved through one of the SWITCH-ASIA program

During IGEM Malaysia's largest Green Tech Convention, then MGTC CEO En Ahmad Hadri Haris announced that to date, there are 25 certified organizations since 2010, with 996 Certified Energy Managers in Malaysia alone. The measureable published results from the initiative was the reduction of carbon emission was approximately 36,000 tonnes of CO2 from the 52 million electricity energy consumption for the six years period as posted by the Borneo post on the 13th October 2016. MGTC took the initiative further, using AEMAS as a guideline [13] for the engineering services in Ministry of Health to build the energy management system as stated in the guidelines. The aspiration is for all hospitals to achieve 1 Energy Star certified Hospitals by the end of 2018.

Dairy manufacturer was one of the benefactors among the 25 certified organizations in Malaysia. On the micro level this organization managed to achieve sustainability through AEMAS certification by progressively establishing an energy management team, engaged a CEM, performed energy audit and implement energy conservation measures. Using the regression model as a measurement tool over three consecutive years on energy consumption with production. The result reveals R2 values of 0.62458 in 2012/2013, 0.82654 in 2013/14, and 0.87833 in 2015/16, respectively [14]

5. Conclusion: AEMAS to LCC

Many initiatives were lost in translation with regards to sustainability. In the midst of divergence, certainly the requirement is to be able to meet long-term sustainability that converges upon the fundamental principles of a triple bottom line. The result from this paper highlights the effectiveness of macro level ingenuities like AEMAS pulling through to benefiting people, planet and remain profitable. AEMAS became the first benchmarking tool pertaining energy efficiency across facilities for the region. The tool had increased the professional standing of accredited energy managers. Furthermore, upon adoption and implementation of an Energy Management System, the industries had been able to seek recognition providing avenue for better revenue. Having the good micro level building blocks, Malaysia is now gearing towards the larger agenda of low carbon cities contributing to the aspiration of lower carbon emission as a sustainable development goal.

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