論文（*Article*）

Synergizing Renewable Energy, Regional Governance and Bio-Regionalism? Questioning People's Clean Energy Sourcing Strategies in Risk Society

オン・クォック・ライ
On-Kwok Lai[1]

The 15th United Nations Climate Change Conference (COP15), 7-18 December 2009, though achieves not much in making global (nation states') reduction of greenhouse gases; it does main-streaming eco-development initiatives for alternative, clean, renewable energy. This paper examines recent initiatives (by society, the state and market) for eco-innovations, synergizing alternative-clean energy yet ensuring local self-sufficiency, with focus on the role the state and citizens for green energy sourcing. Using case studies from the Asia-Pacific and taking the Risk Society (Ulrich Beck) debates, this paper examines the intertwined dynamics of technological innovations for clean technology, and the socio-cultural conditions, which shape socio-ecological defined 'self-sufficiency' for nation/local state, and for bio-local-regionalism. After an introduction on recent (enlightenment for sustainable) development for, or the re-discovery of, the alternative-clean energy in both developing and developed economies, Part 2 of the paper outline the mainstreaming of the alternative, clean and renewable energy development strategies; followed by Part 3, which critically examines the embeddedness of the alternative-clean energy paradigm, with specific reference to socio-ethical-cultural construction(s) on the arguable, ambiguous concepts of sustainability and self-sufficiency; with examples from Asia's newly industrializing economies (China, South Korea, Taiwan, and the ASEAN-5) and the self-sufficient one (Kingdom of Bhutan). Part 4 discusses the nexus between people and energy uses, as well as the interfacing process between praxis of bio-regionalism and the search for energy in-dependence, highlighting the role of policy learning and innovation at transnational and local levels. The paper ends with critical remarks on emerging alternative-clean, renewable energy regime, towards eco-modernity.

Key Words : Energy, Bio-Regionalism, Clean Energy, Climate Change, Geo-Politics, Risk Society

1. Re-Discovering Clean Energy Sourcing for Ecological Modernization

The double-failure of the United Nations' initiatives on Climate Change is more than obvious, as shown by the diplomatically sound-good but politico-policy weak declarations of both the Bali Conference on Climate Change (3-14 December 2007) and the Copenhagen Conference (COP15; 7-18 December 2009).[2]

1 On-Kwok Lai, Professor, Graduate School of Policy Studies, Kwansei Gakuin University, Japan.
E-mail: oklai@kwansei.ac.jp

2 See http://unfccc.int/2860.php and http://unfccc.int/meetings/cop_15/items/5257.php, for the Bali and the COP15, respectively.

The inertia against "the global solution for global problem" is ironically demonstrated also by the well participation of the emerging economies, like the BRICS (Brazil, Russia, India and China, South Africa) countries and the once reluctant participant for global governance for climate change, the U.S.A. Here, the role of BRICS has particularly critical in shaping global warming that since 2007, the BRICS countries, representing one-fourth of the world GDP, have contributed to over 30% of global energy use and 33% of CO_2 emissions from fuel combustion (IEA 2009a/b).

The 193-countries' diplomatic "consensus" at COP15 is not strong enough for moving any policy for reducing green house gases, nor a system and target for emissions: literally there is less likely global consensus in policy and governance structure terms for combating the Climate Change in the post-Kyoto era (Crooks 2010). This is indeed problematic for the sustainability of the Earth. But because of this conundrum, the importance of developing the alternative clean energy, undertaken by different agencies at different geo-spatial scale, like regional, national and community levels, is therefore critical for our future. This brief attempts to articulate the potentials and prospects of ecological energy sourcing in Asia-Pacific.

Population and economic growth demand energy – this is particularly in East Asia, led by its Economic Miracle and more recently, China's hyper-development in the last few decades (ADB 2010). The recent dramatic increase of energy prices, juxtaposing the depletion of natural resources, with ever-increasing demands from the newly industrializing economies (NIEs), highlights this trend. The limits of existing (and potential) energy sources, as well as their environmental impacts, have been articulated with the changing paradigm to search for alternative, eco-friendly, energy sources, to keep, if not to replacing, the fossil-fuel consumption. A shift to alternative and renewal energy sources is more than obvious at global and local levels – this is self evident by the footprints of political leadership in the last decade: where they visit and commit the budget.

At global level, major sources of green house gases are from, in terms of contributory ranking: power plants (in developed economies): 24%, slash-and-burn land clearance and deforestation (mostly in the developing ones): 24%, industrial production: 14%, transport: 14%, and agriculture: 14%, and domestic household: 8%. This pattern of green house gases emission reflects that global warming is much shaped by modernizing or westernization of lifestyle in the developing ones – recently, the international climate panel has confirmed the irreversible trend for global warming (IPCC 2007).

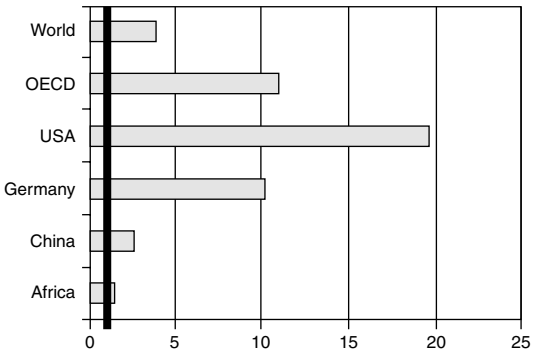
According to the estimates by International Energy Agency (IEA, 2009), major CO_2 emission countries: in total terms (millions of tonnes) are USA, China, Russia, Japan, India, Germany, Canada, U.K., Italy and South Korea; but the CO_2 emission order changes, when measured in terms of per capita terms: USA, Canada, Russia, Germany, Japan, South Korea, U.K., Italy, China and India (see Fig.1 and Fig.2).

Fig.1: Major CO_2 Emission Countries

Country	Million tonnes	per capita tonne
USA	5,729	**19.7**
China	3,719	**2.9**
Russia	1,527	**10.6**
Japan	1,201	**9.4**
India	1,050	**1.0**
Germany	854	**10.4**
Canada	553	**17.5**
United Kingdom	540	**9.1**
Italy	453	**7.8**
South Korea	448	**9.4**

(Source: IEA)

Fig.2: Per Capita CO_2 Emission in selected Regions (t/per capita)

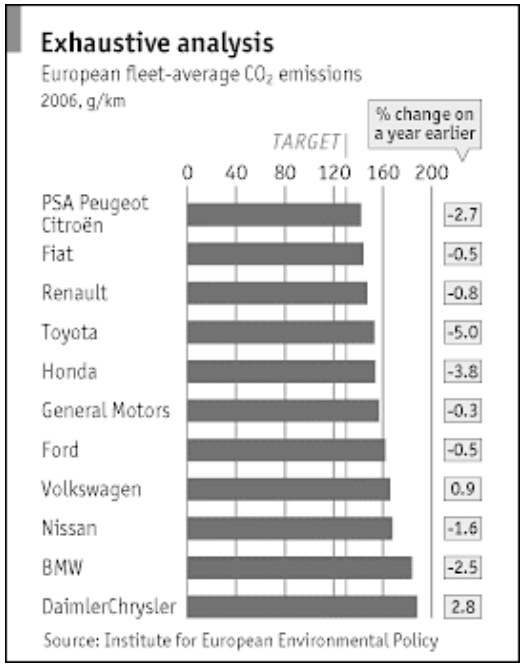


(Source: Krewitt, et al. 2007, p.4970)

Contrary to failure of the Climate Change Congress in Bali and COP15 to make quantitative quota for controlling green house gases emission, the European Commission will adopt a tougher measure

to tackling carbon emissions. Given the trend that transport-related CO_2 emissions in the European Union grew by one-third between 1990 and 2005 and, in 2007, constitute 27% of the EU total, cars and vans are responsible for about the half (the Economist, 19.December 2007, Fig.3). The reduction of CO_2 is slow in the last decade: about 1.5% a year rather than the 3% needed to meet the voluntary target of 140g/km by 2008 that the industry agreed to at the beginning of this millennium; in 2007 Europe's cars still emit an average of about 160 grams of CO_2 per kilometre (g/km). The European Commission is therefore insisting that by 2012, the fleet-average emissions from new cars sold in the EU must not exceed 130g/km, with another 10g/km reduction coming from other sources, such as low rolling-resistance tyres, more efficient air-conditioning and greater use of biofuels.

Fig.3: Automobile Emission in EU 2006



(Source: The Economist, 19.December 2007)

Here, international policy learning and cross-border initiatives for sustainable future are important, juxtaposing transnational mobilizations for socio-ecological justice advocacies (Abe & Lai 2008, Lai 2008). More importantly, Saskia Sassen has rightly pointed out that, in a globalization era, there is inter-play of local social agencies, national and (sub-)regional institutions, in shaping regional-global policy agenda (setting):

> The second example relates to a number of less noticed settings where this fresh combination of elements is also apparent. In some ways the European Union in its latest decade can be seen as a complex and well-achieved third space - neither fully national, nor fully transnational, with a multiplication of specialised trans-local orders that crisscross the old borders (Sassen 2008).

2. Scenarios and Strategies for Securing Clean Energy

In spite of the 2008-2009 global financial crisis, the Asia-Pacific region still, and will be, the booming region for energy consumption: in addition to economic dynamism of China and India that will generate more demand for energy consumption, Southeast Asia's energy demand will expand by 76% in 2007-2030, according to World Energy Outlook 2009 (ADB 2010, IEA 2009a)-hence, it is almost certain that the robust and continuing energy demand in Asia-Pacific will not just drive the sourcing, production and consumption beyond its regional boundaries, but also shaping the course of energy-driven climate change. For instance, China and India become the top buyers for not just global energy end-products of coal, oil and natural gas, but also the energy companies as well (*Financial Times*, 19.May 2010). And the new challenge is how to use clean and renewable energy to make less environmental damages, mitigating global climate change.

Facing global environment challenge, like the global climate change and warming, human societies are moving towards an ecologically reflexive orientation, towards sustainable development (Beck 1992, 2006). Hence, it is the developmental trend from the pro-growth one to the post-material, communicative and sustainability one, respecting not just human rights but also animal rights and bio-diversity (Abe & Lai 2008; Lai 2008).

Paradoxically, the search for green and renewable energy sourcing has brought back, or the rejuvenation of, the once risky nuclear energy – the International Energy Agency (IEA) has projected that it will account for 10% of global energy sourcing in 2030 (IEA 2009a). In 2010, there are total 436 nuclear power plant; and 57 are newly commissioning or in the building stage: in 2009, 11 of the new nuclear plants were completed; given the average commissioning rate of one to six new nuclear plant(s)

every year from 1995 to 2010 (Fig.4). But the problem for nuclear energy is not just its high costing infrastructure building but also its risk beyond the regional disasters, as highlighted in the Chernobyl and Three Miles Island. More problematic is the mis-matching of nuclear power plant expansionary needs for professionals and the reduction (attrition) of nuclear expert for up-keeping the existing and new stock of nuclear power plants: from 2010 to 2025, years, 50% of nuclear experts will be retired; due to the stoppage of nuclear power development, the under-development of staffing/training, after the Chernobyl disaster (1985).

Fig.4: Global Nuclear Power Plant

Nuclear Power Plant by Selected Asian Countries

Japan: 54 (1)

S.Korea: 20 (6)

Taiwan: 6 (2)

China: 11 (23)

Russia: 32 (9)

India: 19 (4)

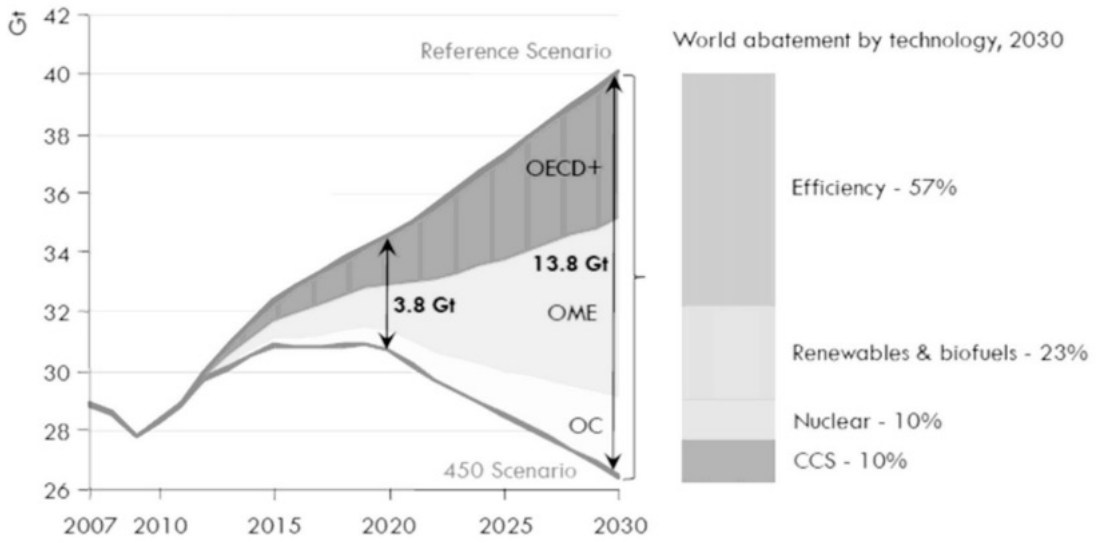
Pakistan: 2 (1)

** Global Total: 436 (in building/completing stage: 57)

(Source: *Kobe Shimbun* 17.May 2010, p.8.)

To mitigate the Climate Change and securing a sustainable development course, both international governmental organizations (IGOs), like International Energy Agency (IEA), and non-governmental organizations (NGOs) like the Greenpeace International, have been proposing new strategies to increase the energy efficiency through better technological know-how and the shift from the existing energy sourcing to the alternative, clean and renewable, ones, to cap global climate change from the "status quo" of the 6 degree Celsius increase to the 2 degree Celsius. For the IEA, it is the so-called *450 scenarios* (capping the CO_2 within the 450 parts per million/ppm) with a mix of energy technological advancement – like the efficient use of energy, redeveloping nuclear energy and the use of new technology – carbon capture and storage [CCS] (which has never been operated at mass and commercial scale), and the shift to renewable energy and biofuels (IEA 2009a/b). But other advocacies have doubted the contribution of CCS and nuclear energy – which needs to be developed at a very fast rate of one nuclear power plant being commissioned every month up to 2030. For instance, Greenpeace International promotes their *[R]evolution* strategy which stresses for a fundamental shift of lifestyle (hence reducing and smart energy consumption), decentralizing of energy sourcing and the use of alternative, clean and renewable energy, with better green policy guidance and incentives (Greenpeace 2008a/b; see Fig.5, Fig.6 and Fig.7).

Fig.5: World Abatement of Energy related CO_2 Emissions



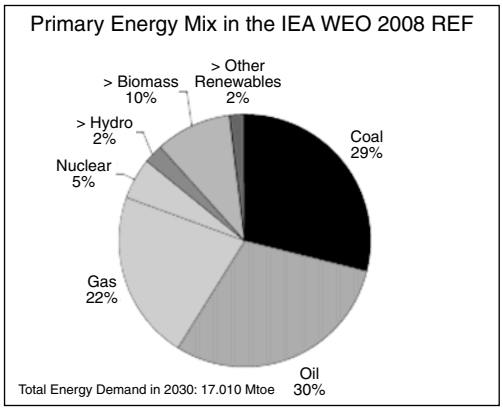
(Source: IEA 2009a)

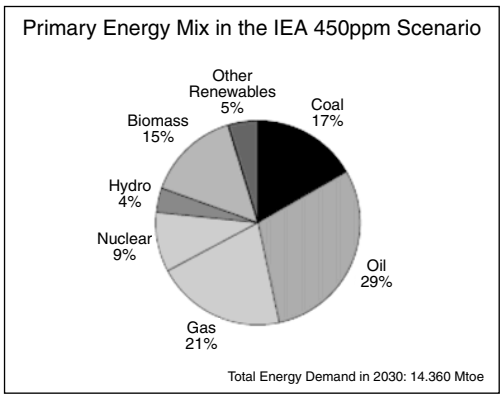
Fig.6: Energy Mix Scenarios by IEA and Greenpeace

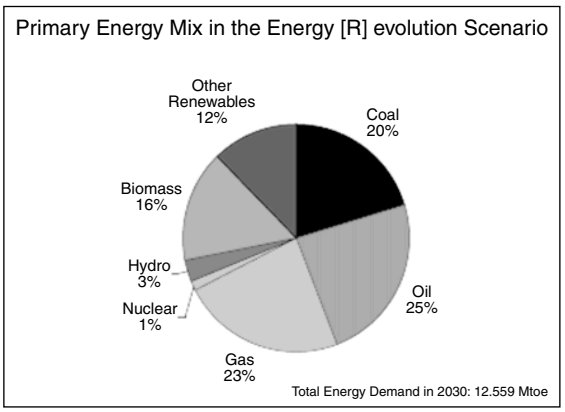
Results WEO 2008 versus E[R] 2008

Energy Mix

World energy demand in Mtoe by 2030 WEO 2008 vs E[R] 2008				
	IEA			Greenpeace
	REF WEO 2008	550ppm	450ppm	E[R] Mtoe
Coal	4.908	3.575	2.381	2.449
Oil	5.109	4.689	4.308	3.011
Gas	3.670	3.383	2.950	2.942
Nuclear	901	1.086	1.364	177
> Hydro	414	456	555	380
> Biomass	1.662	1.826	2.119	1.987
> Other Renewables	350	458	683	1.527
total RE	2.425	2.749	3.357	3.894
Total	17.014	15.483	14.360	12.473



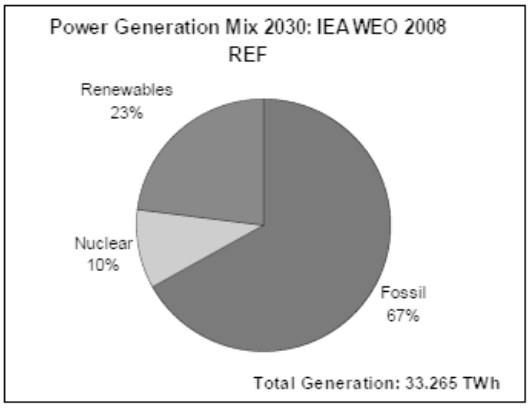


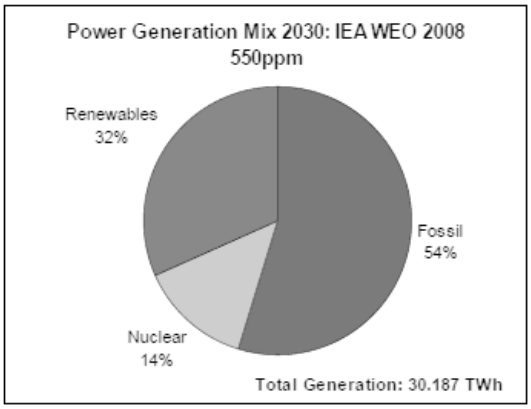


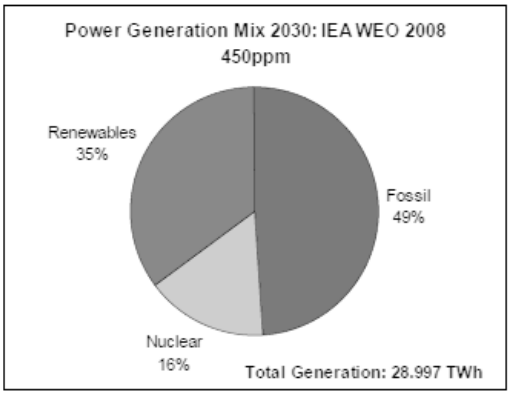
(Source: Greenpeace 2008a)

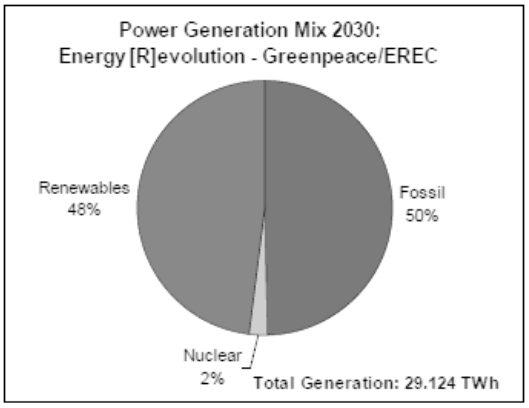
Fig.7: Electricity Mix Scenarios by IEA and Greenpeace

World energy electricity in TWh by 2030 WEO 2008 vs E[R] 2008				
	IEA			Greenpeace
	REF WEO 2008	550ppm	450ppm	E[R]
Coal	14.637	9.757	16.224	7.784
Oil	665	674		325
Gas	6.986	6.056		6.335
Nuclear	3.327	4.166	5.200	678
Renewables	7.651	9.534	11.697	14.002
Total	33.265	30.187	28.997	29.124









(Source: Greenpeace 2008)

For obvious reasons, the approaches for Climate Change, hence energy policy initiatives proposed by the IEA (2009a/b) and Greenpeace International (Greenpeace 2008a/b) are different. Two major differences are: firstly, on the use of nuclear energy that the IEA predicted it will take up to 10% of the world energy supply, whilst Greenpeace International, taking into the problems of commissioning and de-commissioning of nuclear power plant, noted that it will only contribute to ca.2% of the world energy supply. Another point of the debate is on the use of carbon capture and storage technology (CCS) which is still at experimental phase, IEA predicts that it will contribute to 10% of the carbon dioxide emissions, but Greenpeace International doubts this un-tested, non-commercialized, nor mass scale application of the CCS technology in the coming decades.

Despite their differences for policy advocacies, both the IEA and Greenpeace International have consensus on the efficient use of the existing energy sourcing, shifting away from fossil fuels (coal,

oil and gas) or within the fossil fuels sector (from coal and oil to the less pollute natural gas), and the adoption of the pro-active policy, in terms of regulation and incentives, for the alternative, clean and renewable energy development.

To recapitulate, though differential policy emphasis for energy sourcing and socio-technological development, the alternative, clean and renewable energy is mainstreaming for global development. At this historical conjuncture, it is important to note that, alternative-clean energy (biomass/fuels, geothermal, solar, wave, wind and alike) has made astounding progress in the last decade, promising a sustainable future for *homo sapiens* and eco-system. In particular, alternative-clean energy contributes to various kinds of eco-efficiency and efficacy which can be defined, depending on the resources, that are taken into consideration on both the input-and-output not just in terms of efficiency in traditional energy measures, but more importantly, the positive contributions to the reduction of carbon emissions, reducing the (risk) burden onto global-local eco-system at large.

Renewable energy sources are diversified but coupling to different socio-technological interfaces – this make the seemingly shift toward a sustainable future problematic. For instance, nuclear energy though receiving rejuvenation recently in the wake of energy price upswing, it could hardly be any important role – even the best scenario by IEA (2009a) accounted if for around 10% of the total energy share in 2030; not to mention the building, regulatory and commissioning delays and the decommission problems involved (Greenpeace 2008b). On the other hand, the cost of solar energy is still expensive, power from photovoltaic systems (solar cells) costs $200-600 a megawatt-hour(MWh), as compared with $50-70 per MWh for onshore wind power in America (*The Economist*, 15.April 2010). Yet, the appeals, and inevitability for, alternative regime and new sourcing-structure for energy are more than obvious, as alternative and renewable energy resources, like wind, solar and others, have been harnessed demonstratively with minimal environmental consequences. For this, we shall show later that, the thoughts (green ideologies) for alternative energy sourcing are very different from the dominant materialistic one and its derivatives re-define pro-growth development.

3. The Socio-Culturally embedded Energy Self-Sufficiency

Clean and renewable energy use is structurally anchored with different contextual and subjective conditions, particularly the embeddedness of the socio-ethical and normative-cultural construction(s) for new energy sourcing on the arguable, ambiguous concepts of the sustainability and self-sufficiency (say the least: what is good (bad) energy sourcing, under which (stakeholder's) criteria.[3] Before we examine the normative aspects, let us examine the particular case of the alternative, exceptionalism of development-in-context.

3.1 Burning-Out Slowly: Search for Renewable Energies

Modernization in the West(ernization) has been enabling a secularization process, regarding (forgetting or neglecting) the symbiosis, mutually-dependent relationship between human beings and the natural milieu they are in; this is somewhat the emergence of the post-religious regime of comprehension of the universe but not post-spiritual. Yet and lately, the spirituality of the nature (animals, plants and their micro-biological living systems – the bio-diversity in short) is more than ever being re-discovering and re-articulating in the public sphere....This is self-evident in the greening of public policies and global governances championed by mostly inter-governmental organizations (iGOs: like the UN, the World Bank, the EU and APEC), and international non-governmental organizations (iNGOs), like Greenpeace and PeTA (People for the Ethnical Treatment of Animals, http://www.PeTA.org/).

Historically, the dominant developmental model in Asia since the mid-20th century has been much following the successful experience of Japanese modernization, and not long ago with *Asia Miracle* of/with the newly industrializing economies (NIEs, like South Korea, Taiwan, Hong Kong and Singapore), ASEAN-4 (Indonesia, Malaysia, Thailand and the Philippines) and the Greater China. More specific, in early 1990s, most of the nation states have to champion its project for economic liberalization, for embracing the global free market capitalism. They adopt the international financial institutes (the World Bank and IMF) recipe for reform in macro economic policies, in order to make

3 For the *problematique*, the UNESCO Bangkok Conference/Project (Engwerda-Smith and Macer 2007) addressed the scope and complexity of ethical issues of renewable, sustainable energy sourcing and technologies; see Conference Web site: http://www.unescobkk.org/index.php?id=energyethics

their economies more competitive. Their strategies are the deregulation of international capital flows and trades, and the re-making of (the once protected or socially guaranteed) labour market into a deregulated (less rigid, more dynamic and more flexible) one (Navarro et al. 2004). But in fact, they are burning the world, energy and resource-wise speaking!

The success of Japanese modernization is path-dependent upon economic and technological structure and dynamics. Endowed with good technology, energy use is highly efficient in Japan, yet energy-wise it is one of the world's largest importers of energy in the world before the rise of China and India, and still much dependent upon the global sourcing of energy, with existing fossil fuels regime –and one of the few culprits for global warming, as well as the questionably peaceful user of nuclear power.

There is strong energy sourcing potentials for Asia-Pacific: far from the misconception about the limited natural resources in Asia-Pacific, Australia, Brunei and Indonesia (and Myanmar) have been major exporters of energy in and beyond the region. For instance, Australia is also a major supplier of energy resources in the region, coal, liquefied natural gas and uranium (for China and India in particular), say the least. And turning northward, despite its energy deficits for Chinese and Indian economies, it is still one of the major fossil fuel (coal and oil) producers in the world. Even in the developing economies like the ASEAN-4, the potentials for alternative renewable energy (bio-mass, geothermal, solar, water and wind) are yet much under-exploited (Lidula, et al. 2007).

Like the history of other developed economies in the West, majority of Asia-Pacific economies have been dependent upon global supplies of energy: with good iGOs' policy narrative that they are mutually inter-dependent, but in the worst form, there is neither sustainability (for eco-system as a whole) nor self-sufficiency (for individual nation state and community). For this, below we bring back in a special, if not exceptional, primitive energy user-actor, namely, the Kingdom of Bhutan.

3.2 Bhutan: *Shangri-La* for Self-Sufficiency?

Far from the hegemonic development model, as agenda set by iGOs and/or following the modernization trajectory of Japan, *Asia Miracle* and ASEAN-4. The Bhutan's (alternative) development approach attempt to mediate human wishes for (moral-religious pursuit of) happiness, spiritual eternity and the preservation of natural environment deserves our special attention (Fig.8). In spite of its under-development in terms of the traditional, pro-economic growth criteria (contrasting the export-let economic miracle in the region), it has been endowed with much not just natural resources of hydropower and forest-based assets, but also the specific gifts of cultural-ethics of Buddhism, in pursuing the "Middle Path" development strategy (the so-called Gross National Happiness, GNH), and so far resulting in progress for the alternative developmental regime towards the betterment of (well being of) the people, poverty alleviation and sustainable development (Uddin et al. 2007; Zurick 2006, Fig.9).

The most important aspect is the ethics and norms for development. The developmental ethics within the realm of GNH are articulated in terms of the shared needs, and the wellbeing, of *homo sapiens*, and the locals they are in: the socio-economics as well as the emotion-spirituality of the individuals, within a wider ecological milieu. This in turn, translates into policy for socio-ecologically sounded development towards sustainability and self-sufficiency.

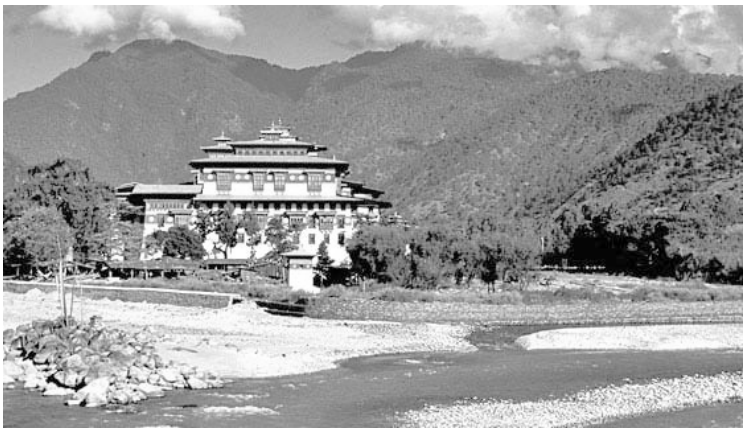
Yet one distinct ethic-normative aspect of this experimentation should be noted, which is rightly noted by Uddin, (et al., 2007) that:

> In the context of Bhutan, there are a number of conditions conducive to the development of GNH. These include: geographic setting as discussed earlier, size of the economy, the influence of Buddhism on the national culture, and support from the King and the Government. While Buddhism as a path of self transformation has to be taken on consciously by each individual concerned, historically it has played a significant role in developing conditions that have had a very positive impact on local culture and society.
>
> GNH is rooted in the Buddhist philosophy and religion, which interprets nature as a living system rather than just a resource base to be exploited for material gain. In fact, the expression of GNH in Bhutan is essentially a summarization of the basic tenents of Vajrayana Buddhism, which encourages a culture of harmony and compassion. GNH also bridges the gap between values and development. Therefore, the ideals of GNH place Bhutan on a footing, where it can exercise options and obtain judicious benefits from the process of liberalization

Fig.8: Geo-Position of Bhutan

(Source: http://www.bhutanculture.org/images/Bhutan_Location_Map_2.jpg)

Fig.9: Kingdom of Bhutan: Buddhism in Nature



(Source: http://www.backroads.com/images/trips/WBTQ9-bhutan-walking.jpg)

and globalization taking environmental, social and cultural impacts into account. It is seen as the overarching philosophical underpinning and the ultimate guideline for the nation's future (Uddin, et al. 2007: 2088).

Despite its emerging celebrity status in the global search for alternative development paradigm(s), Bhutan's experimentation is far from conclusive; and in some instances, is highly questionable not just about its transferability beyond the Himalayan localities, but also the very specificity of Bhutan that it is not a homogeneous society. Hence the singular Buddhist and socio-cultural appeals have the limits to convincing the non-or-less materialistic, pro-happiness approach for development; this is particularly the case when Bhutanese society has to confronted with globalization challenge, eco-and cultural tourism for instance (Zurick 2006: 663).

To examine the Bhutan case in specific terms, five major eco-human development ethics stand out as alternative paradigm(s) for sustainability (self-sufficiency within the bio-regionalism):

(1) Geo-territorial specificity for self-sufficiency (that is fundamental for bio-regionalism, in a geo-territorial closed system, following the metaphoric life-cycle-analysis): Bhutan is a landlocked country, geo-politically enclosed by regional nuclear giants of China and India. Its bio-diversity is much protected, if not isolated, by its unique geo-historic-political position.

(2) The practice of spiritual teachings of folklore and/or religion(s), in the Bhutan case, it is the specific 'framing' of Buddhism unto daily (socio-cultural-driven) praxis. Bhutanese unique integration of folklore, quasi-religious-informed, daily practices with specific geo-cultural objects, like river and forest-wood assets, synergizes survival needs (towards happiness) to ecological-sound energy use.

(3) The interfacing between social praxis and modern form of policy governance: people's specific socio-cultural attachments to the nature and its assets, in exploiting natural resource, in daily praxis on the one hand; the (derivatives of) policy learning, like the Clean Development Mechanism (CDM) from iGOs and donors in shaping national policy for natural resources exploitation and preservation.

(4) Ethical sourcing of alternative renewable energy has a geo-local dimension, mostly within the transportation network (e.g., electricity power grid) of certain locality; in this sense, the search for local energy self-sufficiency is a twin condition for sustainable strategy. The locality-fix (sense of localness) and geo-spatial attachment are intertwining with liveable and sustainable socio-ecological system.

(5) Most important of all: the Bhutan experience highlights one of the forgotten dimensions of the feasibility to coping and adapting differential energy sources, with particular reference to the (micro social level of) individual's household choices for energy, as expressed in terms of the specific ethic-normative nexus.

In addition, there are three more different yet inter-related domains of synergy, for enhancing individual's experiential preference for certain renewable sources.

Firstly, it is a form social praxis with individual experience: people have been in contacts with most renewable yet natural energy resources, say, water, wind and sun. This sense of familiarity and co-inter-dependency (particularly water and wind – pressurized air in motion) conditions the sense of belongings, which under right circumstances, helping or beneficial to coping with one's energy need – then the likely synergy-bondage between users and the energy anchorage evolves.

Secondly, it is the socio-cultural-religious and/or the pre-modern folklore 'framing' of the form and essence of renewal energies. Unlike fossil fuel (coal and petroleum) and nuclear (risk-ridden), most of the renewable energies (like geothermal, water, wind, sun and biomass) are somewhat experiential for the users, that users have been in direct contacts with them in daily life experience; and in some cases, their familiarity with renewable sources of energy is also spiritually reinforced by legends, mythology and folklore, God and Goddess like figurative/symbols for most natural resources (sun, wind and thunder alike).

Last but not least, it is the rejuvenated interests on, or for the search of, alternative energy, juxtaposing the new public policy (learning aided by new media of iGOs and iNGOs) narratives on global climate change energy crises, in global risk society of this modernity. By the re-orientation of energy sources from fossil (eco-unsound) fuels to the new (age! but also the old) one, the greening of cultural meanings in/for exploiting natural resources, like river and forest in a sustainable way becomes the norms. Here, the re-presentations of healthiness of the nature and

its re-attachment with human beings are once again intertwined with other cultural-spiritual figurative for the natural phenomena, like sun (solar energy), wind (monsoonal typhoon) and wave, thundering....In short, eco-ethics is structurally and historically embedded with indigenous cultures; yet they are also derivatives from modern international policy learning discourses, to articulate eco-ethics for sustainable future – here, we need to take history and cultures seriously.

4. The Geo-Politics driven Bio-Regionalism: Green Praxis for Energy Sourcing?

Against the backdrops of economic dynamism-driven global sourcing of, or hungry for, energy for newly industrializing economies' hyper-development, China and India in particular, most of the super-regional states or regional alliance, like the EU, ASEAN and APEC, have been increasingly energy dependency on the imported or global sources, and have not much policy initiatives at regional or local level for energy self-sufficiency. Yet all that (since Fall 2006) European energy crisis in regional-global sourcing of energy, has now changed: Europe found itself from a troublesome source, in addition to new geo-political dynamics and rivalries: the Russia's Gazprom is more than obvious. Such dependency has been manifest in Ukraine's dispute with Russia in January 2006 and Belarus in January 2007. In each case - gas and oil respectively - Russia cut off suppliers, albeit briefly, and in both cases the "price" of agreement included ceding control of pipelines. Geo-politically, Russia's foreign policy towards its former allies around the oil- and gas-resourceful Caspian Sea has become more confrontational, the Georgia's energy independence attempt with the Western world is the flash point (Helm 2007).

Here, the ethical interfaces, as well as the interfacing process, between the eco-praxis and its bio-regional(ism) local-spatiality, in searching for energy in-dependence, highlight the role of policy learning, within the web of geo-politics, at transnational (inter-state, iGOs system) and corporate business levels: between local wisdom and foreign knowledge.

Undoubtedly, the Bhutan case has some success. For instances, renewable energy resources have a substitution role for the fossil fuel ones, for better environmental consequences. In Bhutan, there is beneficial effect of rural electrification for the environment, as villages under the hydro-electrification schemes tend to use less fuel wood and kerosene; this is particularly the case for the so-called min/micro hydropower (<1MW) and the run-of-the-river hydro-projects, which are of low environmental and social impact in comparison with the large one. For the environment, the reduction of fuel wood consumption by 25-25% in rural area by the electrification scheme (Uddin, et al. 2007). The partially successful lesson of Bhutan has some implications and ramifications for the rejuvenation of renewable energy development-trend in Asia-Pacific.

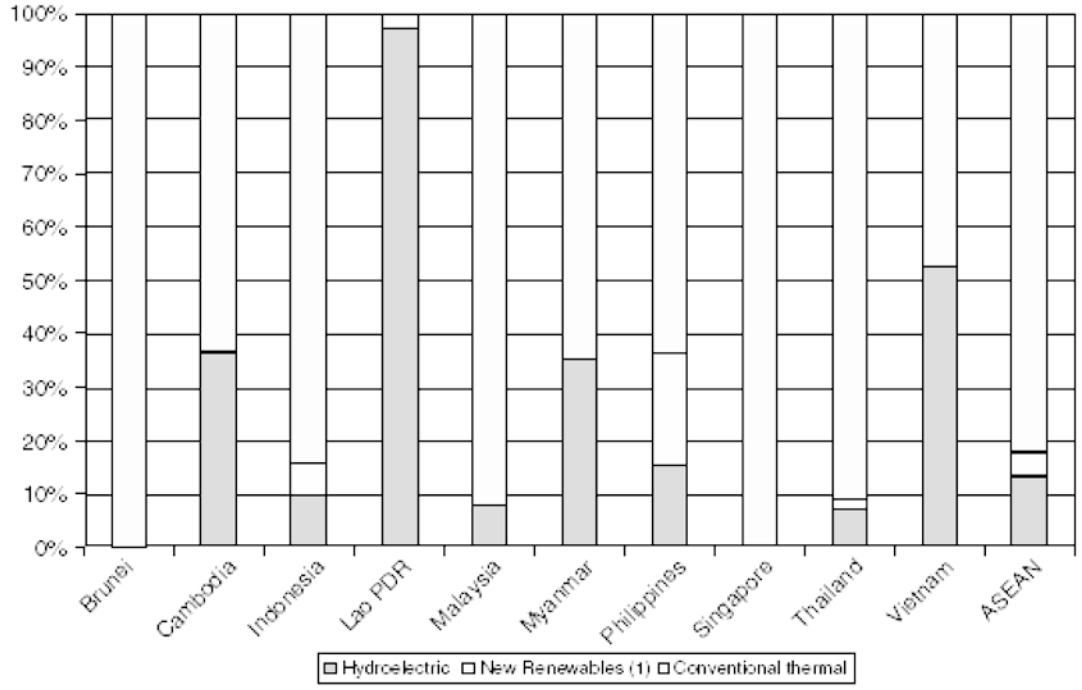
The challenged of energy supply security, in the context of climate change mitigation strategies (like CDM, and the apocalyptic narratives of IPCC), is not just local and national, but also global issues, which re-define and re-shape alternative energy sourcing in Asia-Pacific: a rejuvenation of exploration for renewable energy is the policy norms in the region; this is particularly the case that. the present state of renewable resources in the region is far from minimally utilization, given its well endowed natural resources hence strong potentials for enlarging its energy market (Lidula, et al. 2007; Fig.10).

In actuality, there is some progress of adopting renewable energy in the region, even for the developing countries, like India (the second largest population in the world), its solar energy generation capacity ranks to the 4th in the world league, following Japan, Germany, and the United States. With more fiscal incentives, enhanced regulatory policy guidance and technological transfers, Indian government aims to increase the renewable energy share in the total energy supplies from 7% (in 2007) to 10% by 2012. But the critical ethical question is: should fiscal incentive (reflecting certain externalized values) per se be the policy to re-direct human orientation towards a sustainable one?

Globally speaking, Asia-Pacific has the highest potential for hydropower (DENA 2007), more importantly: hydroelectric power is highly efficient that the plants convert over 90% of the water energy into electricity, and their long service life between 60 and 90 years (DENA 2007; Fig.11).

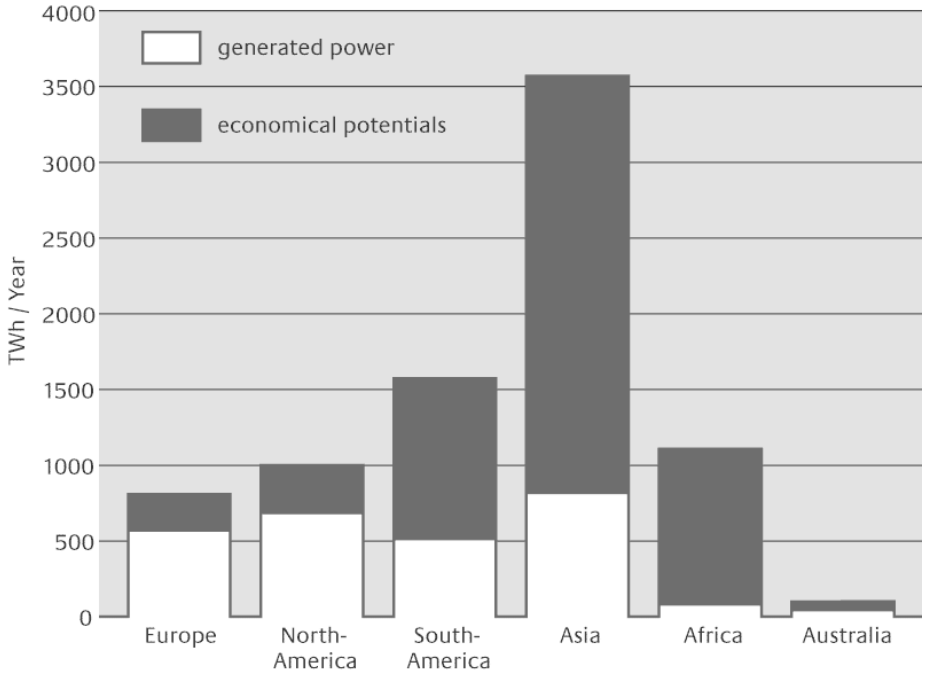
As the under-utilization (mostly less than 10% of the energy sourcing) of renewable energy, some countries in the region (– following their counterparts in Europe), like Sri Lanka, Thailand, Indonesia and South Korea, have introduced price incentives for electricity from renewable sources. Whilst in urban sector, municipal solid waste (MSW)-to-energy regime for renewable energy sourcing is experimenting in Asia major cities, like Bangkok (Chaya and ,Gheewala 2007). Again, is the pricing

Fig.10: Energy Utilization in ASEAN Countries 2005



(Source : Lidula et al. 2007, p.1443)

Fig.11: Global Hydro-Power Analysis



(Source : DENA 2007)

(or the use market mechanism) per se facilitates a new paradigm shift towards eco-modernity?

For Chinese 1.3 billion populations, despite its three-decades of economic miracle, rural sector in China is still much under-developed, particularly in terms of electricity supplies. The government is now promoting multiple sourcing of renewable energy driven electrification for remote villages – it is aimed that by 2010, none in China will have any electricity at home. For sure, this policy initiative will be welcome by most people – the ethical issue here: will this repeat history of the tragedy of burning-out the environment for mass consumerism in under-exploited natural spaces?

But at regional and global level, the prospects of Asia-Pacific's renewable energy regime will be led by the political economy of (the struggle for) global energy, within and beyond the historical rivalry between/among developing and developed economies in different geo-political regions: the Chinese energy diplomacy, Australian natural resource-based engagements, the energy-empowered Russian supremacy in Europe and Asia, USA-Japan-Western economies differential engagements in the Middle East development, as well as the rise of African resource-export economies.

Within Asia-Pacific, the emergence of "Islamic" economic alliance led by Indonesia and Malaysia deserved our attention: both have recently re-appropriation of the great potential of palm oil production for bio-fuels, and the former also endowed with the world's largest potential in the geothermal power. The religious-cultural embedded economic alliance for/with energy sourcing will be instrumental in re-defined which countries/societies get what....

This is also the mirror imaging of (or in contrast to) the belated calling from, or the underdevelopment of human (economic, social and cultural) rights and democracy regimes in the region.... Hence, the calling and mobilization for securing alternative renewable energy is geo-spatially local; the sense of indigenous energy resources (the very essence of local ethics) is very crucial in shaping the developmental trajectory of renewal energy consumption in communal life.

5. The Unfinished Project of Eco-Modernity: Post-COP15 for Climate Change?

For the development of the alternative, clean and green energy and the sourcing of it, the COP15 though was a disappointment; it has timely initiated the discussion dynamism for exploring the Climate Change at global level, with the maximal participation of the stakeholders, represented by 193 countries.

Like other global summits, the COP15 should have provided the venue where new directions for sustainable clean energy development are explored – the energy industry worldwide looked for signals, and new regulatory framework to follow. But the COP15 has not provided a blue print or roadmap for cutting greenhouse gases emissions, nor making concrete policy measures and mechanism (say, carbon trading regime) for stakeholders to follow. Perhaps more controversial was the infighting over the inter-nation-states' coordination mechanism and procedural details, in addition to the strong rhetoric between the developing and developed countries – for instance, China has led the advocacies for a non-binding "accord" for any international consensual agreement on the Climate Change (Crooks 2010).

In spite of the problematic diplomatic consensus on the Climate Change at COP15, producing no immediate policy nor emission-reduction targets, the only hope is for the coming Climate Change meeting for Bonn in May 2010 and New Mexico in November 2010: aiming for some forms of "directives" or "accord" that codified the limited commitment for the treaty-like signatory countries in the coming decade.

To recapitulate our discussion: the adoption of global and national policy on climate change, against the trend of the fossil fuel economics (say, the increasing price trend for petroleum), will encourage the development of alternative clean energy to be used in our daily life. Hence, the decisive factors for sustainable development are at three arenas, the international politics for the climate negotiation, the recognition of the climate change threats by national governments, and above all the eco-ethics driven green practices of local communities.

Building an energy vision is crucial for sustainable future, particularly in realizing the potential of energy innovations to overcome energy poverty, with a mix of wind, solar, small hydro, biomass power, or technology such as LED lighting. More specifically,

> These can empower the poor to develop productive small and medium enterprises, to gain autonomy and independence in the generation of energy. Off-grid projects are increasingly seen in areas where publicly regulated electricity grids have found it unviable to reach. These initiatives

> can deliver real change on the ground, enabling citizens to access refrigerated medicines, light schoolrooms, power water pumps and use mobile telecommunications - but only if they are tailored to local needs and delivered in sustainable ways (Litovsky 2007).

For the coming decades, following the exponential increase of energy consumption in Northeast Asia, the Southeast Asia will experience another explosion of energy demands, as shown in the case of Indonesia and Thailand. For the former, despite of its strong energy resource base, Indonesia still (path-dependently) relies on fossils fuels (coal, gas and oil), as well as the rejuvenated interests on nuclear energy, which in the long run is questionably risky for sustainable self-sufficiency (Nazif 2007). Whilst for Thailand, the project(s) for energy sourcing diversification seemingly are progressing well, at least in terms of experimentation of different renewable energies (Charojrochkul 2007, Jai-in 2007), but the pro-development economic strategies and mass consumerism have substantially put up the demands for all forms of energy. Hence, according from Dr. Kurujit Nakornthap (2007), Deputy Permanent Secretary of the Ministry of Energy, Thailand, it has to looking for sourcing from neighbouring countries, all possible forms of energy, the non-renewable as well as renewable, and nuclear power (currently the subject of an infrastructure planning committee) with the intention of operating reactors by 2020. All these will challenge the project for clean, renewable, sustainable, self-sufficiency, energy sourcing in the region.

In these searching for energy sourcing exercises, the market forces undoubtedly will absorb such demands, at the inter-regional and global geo-scales, but with increasing sensitivity for ecological business practice, in terms corporate social (and ecological) responsibility (Epstein 2008).

Lastly to end this paper, critical remarks on the rocky road for the emerging alternative-clean energy regime, towards eco-modernity are as follows.

In 2007, EU for the first time of its history, has set its energy policy goal for the reduction of greenhouse gas emissions to at least 20% less than 1990 level by 2020, to increase energy efficiency by 20%, and more importantly: promoting renewable energies to 20% of the total usage. Whilst in Asia, Lidula et al. (2006) rightly articulate that the (under-)utilization of renewable energy resources in the region is far from anywhere near to the potential, therefore making feasibility to follow the EU case, by reducing carbon burden, with alternative clean energy sourcing.

For comparison purpose: how about the Asia-Pacific regional initiatives towards sustainable development? The only indicative gesture (someone might coin it as 'milestone', as it is the 1st climate declaration in APEC 19-year history) is from the APEC Sydney (9.September 2007) Declaration on Climate Change, which set the unbinding targets – the "aspirational goal":

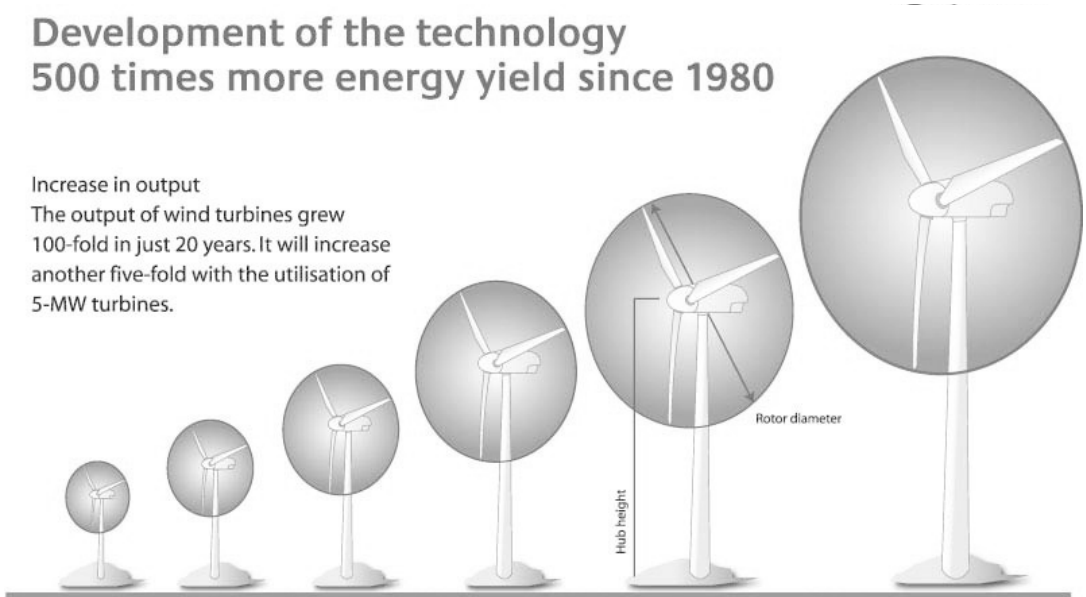
- Increase energy efficiency to reduce energy intensity by at least 25% by 2030 (base year: 2005),
- Increase forest coverage in APEC region by at least 20 million ha. by 2020.
- Foster low emissions technology and innovations
- Enhance alternative and low carbon energy uses

Responding to these, many critics challenge the "aspirational goal" of APEC (representing 21 economies, housing 41% of the world population, which contribute to 60% of greenhouse gas emission globally) as merely a lip service to cope with the global climate crisis – in actuality, say the least: the ecological footprints of APEC activities (in Sydney alone) have been ecologically unsound!

Obviously, there are many normative questions have to be raised: why isn't similar regional initiatives (as in EU) developed in/from Asia-Pacific societies? Can Asia-Pacific unique differential (ecological un-reflexive) modernization processes (or economic miracle) still be robust, without risking the others? Yet, there are four major arenas to contest for a sustainable, self-sufficient energy sourcing in Asia-Pacific.

First and foremost: far from the missing out the opportunities to have alternative sustainable development, and with the exception of the controversial nuclear energy, geo-spatial advantages of East and Southeast Asia are self-evident: mostly in the Sunbelt (exploitable for solar energy), plenty of geothermal, wind, water and ocean resources though untapped yet. For instance, wind energy is mostly under-exploitable in the Asia-Pacific, despite the global advancement of technology to harness wind energy (100-fold increase in the output of wind turbine, up to 5MW turbine, Fig.12), it can be highlighted by the example of Pakistan's under-utilization of wind energy due to a mix of human and institutional barriers, in terms of policy guidance, institutional structure, regulatory and financial incentives, and information and technology (Mirza, et al. 2007; Fig.13).

Fig.12: Advance of Wind Energy Technology



	1980	1985	1990	1995	2000	2005
Nominal power	30 kW	80 kW	250 kW	600 kW	1,500 kW	5,000 kW
Rotor diameter	15 m	20 m	30 m	46 m	70 m	115 m
Hub height	30 m	40 m	50 m	78 m	100 m	120 m
Annual energy yield	35,000 kWh	95,000 kWh	400,000 kWh	1,250,000 kWh	3,500,000 kWh	app. 17,000,000 kWh

(Source: DENA 2007)

Fig.13: Barriers against Adopting Renewable Energy

Barriers	Brunei	Cambodia	Indonesia	Lao	Malaysia	Philippines	Singapore	Thailand	Vietnam
1. Lack of Experience in Technology & Management	X	X		X		X		X	X
2. Lack of Funding		X	X	X	X	X		X	X
3. Lack of Policy Framework	X	X			X	X			X
4. Lack of Institutional Structure				X	X	X		X	X
5. Reliance on National Grid & Lack of Private Sector Participation	X		X			X		X	X
6. Inadequate Date and Information	X	X		X					X
7. Reluctance to Invest due to High Cost			X	X		X		X	
8. Low Efficiency or Quality of RE	X					X		X	X
9. Insufficient RE Utilization		X				X			X
10. Lack of Experts to manage RE				X				X	X
11. Fossils Fuel Subsidies			X	X		X			
12. Taxes on imported Equipment						X			X
13. Inappropriate Distribution Facilities				X					
14. Political Involvement in Reform Agenda						X			
15. Legislation Issues to connect RE to National Grid					X				
16. Objections from the Public								X	
17. Lack of Government Support								X	
18. No Economically viable RE							X		
19. High total installed capacity resulting no requirement for new RE							X		

(Source : adapted from Lidula 2007, p.1448)

Secondly, renewable energy resources are eco-friendly and hence becoming the norms. Yet, people's values -(changed)- driven behavioural repertoires will shape the developmental course of the emerging alternative renewable energy regime(s) on the one hand; the market forces (supplies of clean technologies) and governmental regulation and/or subsidies will have imminent impact as well. In other words, as many of the alternative and renewable energy resources have been utilized for some years, but not until recently, they are being re-discovered to have the potentials for sustainable development.

Thirdly, a bioethics on and for renewable energy has differential manifestation: not just a local dimension but also a cosmopolitan, trans-national, domain. Hence, there is an emergence of cosmopolitanism and the dialogues at various geo-scales, between and among various state, iGOs, and iNGOs and social agencies, and reflections (or the apocalyptic view) towards the (un-) sustainable future – the coexistence of different ways of life experience, as well as the critical reflection on the vulnerability and fragility of human species and eco-system sustainability (Beck 2006, IPCC 2007). Hence, one of the likely candidates for realizing a cosmopolitan responsibility is, in engaging with global forces, to ensure a sustainable way of development.

Lastly, the developmental path of eco-friendly, renewable energy, technologies highlights the derivatives of ethical challenges for the project for energy self-sufficiency within the bio-regional geo-spatial scales: the can be called as ethics of cultural specific and defined know-how and technologies transfer. The control and access to know-how and technologies (transfers) condition the potentials of new form of clean energy are critical that most of the renewable technologies are still very much within, or protected by, the intellectual property regime of governance, mostly held by the developed economies. For instance, Germany, Japan and USA control over three-quarters of global market for solar cells, over 70% of wind turbines worldwide are produced by Germany and its European partners.

In actuality and more problematic, eco-friendly energy technologies, under the intellectual property regime, are becoming more or less monopolized by transnational corporations. For obvious normative appeal: without technology transfers and financial incentive for promoting the use of renewable energy, the prospect for self-sufficient (self-reliance), in terms of renewable and sustainable energy sourcing, in the developing localities in Asia-Pacific is not good nor sustainable, in spite of the small-scale locality based attempts to be more eco-friendly.

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Contact: Prof.Dr. On-Kwok Lai, Graduate School of Policy Studies, Kwansei Gakuin University, 2-1 Gakuen, Sanda, Hyogo 669-1337, Japan. E-mail: oklai@kwansei.ac.jp

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