

# **LOCAL AUTHORITIES PLANNING FOR URBAN SUSTAINABILITY - TOWARDS IMPLEMENTING ENERGY CONSERVATION POLICIES IN DEVELOPMENT PLAN**

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**ABSTRACT:** *This study aims to examine lessons learned from local authorities in United Kingdom on how policies on energy conservation can be incorporated in their development plan. Two` cases of different levels of urban development and population size are chosen as case studies to understand the feasibilities of implementation of energy conservation policies in development plan. Since urban planning in Malaysia is based on British model of development plan and development control system, this study may provide directions and guidance in the implementation of energy conservation in a local planning authority area.*

*Keywords: Local authorities, development plans, energy conservation.*

## **Introduction**

Planning for sustainability in the respect of energy conservation cannot be effective as a top down policy. The role of local authorities is seen crucial in planning for sustainability. This is because they operate as front line, local and regional authorities have particularly important parts through exercise of statutory function as local planning authorities. The implementation needs a bottom up mechanism from support of the local authorities to ensure strategic plans; development control and enforcement are in coherent with the sustainability objectives.

Presently, many of the local authorities in Malaysia particularly the smaller ones, function more as provider and regulators of urban services. There are still scopes for improvement where local authorities can play more important roles as facilitator of local growth and as well as urban manager for the planning of sustainability in terms of energy conservation. In recent years, many initiatives on urban sustainability related to energy conservation were implemented by the Ministry of Housing and Local

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Government, Malaysia, Federal Town and Country Planning Department has outlined urban indicators to measure sustainability of each local authority in Malaysia. A web based planning tool known as MURNINET (Malaysia Urban Indicator) is also launched to assist local authority to assess urban sustainability.

In the case of United Kingdom, a wider scope and roles for local authorities cover the following functions (LGMA 1992)

- a) Spatial planning
- b) Economic development
- c) Infrastructure development
- d) Control of industrial pollution
- e) Waste reduction and disposal
- f) Transport
- g) Tourism
- h) Public information, education and training
- i) Environmental auditing and training

These wide ranging activities undertaken by local authorities will help to ensure a more effective sustainable development at the local level. In addition to the above, the other new European Commission (EC) proposals of importance to local government related to sustainability and energy conservation covers the following:

- a) Directive on packaging and other waste matters
- b) Green paper on transport and environment –sustainable mobility
- c) Eco auditing
- d) Carbon tax
- e) Energy efficiency

In this paper, the author aims to examine how energy conservation principles can be incorporated at strategic planning level. The purpose of this paper is to study local authority's experiences and how energy conservation policies are incorporated in the development plan (Unitary Development Plan (UDPs)). The case study of UK is chosen because urban planning in Malaysia is based on British model of development plan and development control system. It is hope that this study may provides directions and guidance in the implementation of energy conservation in a local planning authority area.

## **Current Energy Policy in United Kingdom**

When land use planning system was introduced in 1947 through Town and Country Planning Act, electricity generation in UK is largely centralized and National Grid was established. Energy supply and transmission were not within the power of local or even county planning authority. With introduction of Non-Fossil Fuel obligation in the 1990s, electricity generation started to be undertaken in smaller units. With these changes, energy generation units are small enough and not to be under the Department of Trade and Industry Control. These responsibilities are then transferred to the Local Planning authorities. Local Planning Authorities were often unprepared with no history of involvement in energy issues when there are applications of wind farms or other forms of renewal energy facilities.

In the Energy White paper – Energy sources for power generation (1998); it stipulated that the government aims for energy, which is to ensure secure, diverse and sustainable supplies of energy at competitive prices. This is within a strong policy context, which is flexible enough to respond to changing national needs and international obligations for cost effective climate change programme.

National energy policy stresses the importance to stimulate the exploitation and development of renewable energy sources wherever they have a prospect of being economically attractive and environmentally acceptable. In this respect, renewable energy sources is defined as sources that includes the wind, water combustion (including anaerobic digestion and landfill gas production), active solar systems, energy crops and wood fuel (or biomass), and water (including hydro-power, wave and tidal generation)

Government has priority for a renewable energy sources to provide 10% electricity supplies by 2010 or sooner (which entails providing 5% of national electricity needs by 2003 compared with the current future of 2% in 1999). As a long-term strategy, renewal-generating power will also serve heating, transportation, industry and commerce in near future. Renewal energy is not only important as jobs creation sector and serves developing future industries as well as play pivotal roles in making UK meeting her environmental targets of reducing greenhouse gases by 12.5% by 2008-2012 and also reducing CO<sub>2</sub> emission by 20% by year 2010 (Government Consultation Paper, March 1999). In order to make renewable energy more competitive in the energy market,

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green electricity options and promotion of environmental credit voucher to consumers of energy will be used.

**Local planning authority's experiences**

After 1992, almost every planning policy related document makes references to sustainable development. However, findings (Hales 2000) based on 79 local authorities showed that many local authorities are struggling to translate rhetoric of sustainable development into practice. It was found that about 60%-70% of the local authorities have supportive document such as State Environmental Report (60%), Nature and biodiversity strategies report (70%) and Local Environmental Agency Plans (60%) in the preparation of development plan. However, only limited (10%-30%) of the local authorities used these reports as inputs into the development plans.

Earlier studies (Owens S E, 1990) based on survey on 34 strategic planning authorities, 43 district planning authorities, 2 national park planning boards and 6 London boroughs and metropolitan authorities in 1990 on the extent of energy considerations are accounted in land use planning showed an overall growing awareness among local planning authorities of the significance of energy efficiency as compared with the early 1980s (Owens 1986). Her specific findings based on survey on county council showed that :-

- a) About 35% of the county planning authorities make some specific reference to energy efficiency in the structure plan especially in the policy or overall goal for evaluation. 2 county councils i.e. Cornwall County Council (1989) and Nottinghamshire County Planning Department (1989) have detailed consideration to energy issue. It is most common to see policies cited are concerned with transport or location policies.
- b) The other related concern is the environmental impact such has global warming. County planning council such as Devon, Humberside and Warwickshire indicated a growing awareness politically of the need to conserve energy. County council such as Oxfordshire and Suffolk expected energy efficiency to be element of environmental audits and action plans
- c) There is about 20% of local authorities in counties suggest that other such as housing, conservation, congestions and settlement pattern were more important than energy.

- d) 44% expressed reservations about the legitimacy of energy efficiency as a strategic planning issue. Many cited the land use format of structure plan and the difficulties of justifying energy related policies in the absence of relevant legislation or guidance. As a result, such policies were perceived to be difficult to formulate and to implement.

On the other hands, the district planning authorities that are responsible for development control and preparation of local plans/unitary development plans has made less progress toward integration of energy consideration than the counties. Findings on the district planning authorities are;

- a) Only 18% respondents make reference to energy efficiency in their plans or informal policies. Energy efficiency has rarely been an issue in development control.
- b) Only about 16% respondents raised at some point either by planning authorities or by environmental groups.
- c) In terms of constraints perceived by the district, 47% of the respondents of the non-strategic planning authorities felt that energy efficiency was not a land use planning issue.
- d) 16% cited that the lack of government advice on statutory requirement to take energy into account. Other factors mentioned are lack of time, resources, expertise and information.
- e) More than 1/3 felt that legislation or government guidance is prerequisites for giving attention to energy efficiency at local or unitary development plan.
- f) 45% of them think it would become more important consideration.

Based on the survey findings of Hales R (2000) and Owens S E (1990), several lessons can be drawn. Hales's study which focused on sustainable development in general showed that the production of supportive texts within each local authority to specifically handle sustainable development agenda was still very limited in the format of background paper, discussion document and vision statement. The study of Owen S E (1990) focuses more on energy conservation showed a fairly strong willingness to act on this issue to integrate energy in forward planning and development control but lack of government advice on statutory requirement.

**Empirical Studies – Integrating Aspect of Energy in Development Plans (Unitary Development Plan)**

In United Kingdom, with the proposed development plan system in 1990, Unitary Development Plan (UDP) will replace any existing development plans (structure or local plans) covering the area in local planning authority. The UDP comprised of a written statement and an overall proposals map together with detailed inset maps for individual settlements or part of a settlement and for other major development sites (for e.g. technology park or large industrial estate). It provides a policy framework for positive forward planning, proposals and allocations for future developments and the basis on which consistent development controls can be made. Proposals must be capable of implementation within the period and UDP will be subject to continuous monitoring and periodic review, the first of which may take place 5 years into plan period.

Written statement consists of two (2) main elements, namely:

**(i) Part 1** – Brief statement of strategic policies for the area. It is a short strategic overview with limited supporting text. These policies provide context and framework for detailed policies and proposal contained in Part 2

**(ii) Part 2** – a more extensive and detailed policies and proposal. It covers 15 main topic areas of

- Environment
- Housing
- Employment
- Transport
- Retailing
- Tourism
- Leisure
- Sport and recreation
- Social and Community facilities
- Mineral
- Waste

- Unstable land
- Energy and Utilities
- Regeneration
- Implementation and Resources

Under Section 54A of Town and Country planning Act 1990 (as amended) makes the Development Plan central to the development control decision-making process. It requires that *“where, in making any determination under Planning Acts, regard is to be made to the development plan, the determination shall be made in accordance with the plan unless material consideration indicate otherwise”*. Additional relevant primary legislation includes the Planning (Listed Buildings and Conservation Areas) Act 1990 and Planning (Hazardous substances) Act 1990.

In the two (2) study cases of Wales, apart from the National Planning policy guidance on the content and provisions of UDPs, other statutory provision from Welsh assembly government include the following:

- a) Unitary Development Plan (e.g. Wales)
- b) Planning Policy Region (Wales)
- c) Technical Advisory Notes (TAN)
- d) Mineral Planning Policy region (e.g. Wales)
- e) Minerals Technical advice Notes (MTANs)
- f) Regional Government Orders, Regulations and Circular (Welsh Office or Welsh assembly Government Orders)

It consists of strategic and local planning policies for the area up to the targeted year (e.g. 2016). It contains policies and proposal for the development of the land in the County Borough and in particular includes land use policies and proposal for

- Transport and highway facilities and other infrastructure requirement
- Housing
- Conservation of natural and built environment
- Economic development
- Tourism, sport and recreation.
- Energy generation, including renewal energy
- Mineral working and protection of mineral reserves
- Waste treatment and disposal, land reclamation, reuse and hazards.

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Two (2) case studies of different levels of hierarchy in Wales are used in the analysis are Cardiff Council and Bridgend County Borough council. These two study cases are chosen because they are the most recent published UDPs in Wales and different population, settlement size and locality and different rural-urban composition.

**Cardiff Council**

**a) Background**

Cardiff Unitary Development Plan (to 2016) was approved in 2003 set out council policies and proposals for the development and conservation of land with a population of 305,000 (2001). Cardiff position as capital city, the seat of Welsh Assembly Government and regional centre for southeast Wales in terms of financial, professional, business, shopping and leisure services. It aims at maintaining Cardiff's development as an attractive European capital and a first class city in which to live, work and enjoy leisure time.

**b) Relevance General Policies (Part 1) related to energy conservation.**

In the Unitary Development Plan of Cardiff, there is no specific provision of general policies on energy but more focus on broader sustainable development principles. One of the 12 general planning objectives mentioned in the UDP related to energy conservation is Objective 10 i.e. safeguard and manage the use of natural resources including **energy**, water, and minimize waste. In addition, other policies contained in Part 1 related to energy saving principles can be found in Policy 1A, 1B, 1 K and 1P. (Refer Table 1: General policies of Unitary Development Plan of Cardiff (Part 1) related to energy conservation)



**Table 1:** General policies of Unitary Development Plan of Cardiff (Part 1) related to energy conservation

Policy	Aspect	Details
1 A	General Principles for location of development	- To make best use of redundant previously developed land & encourage Brownfield development - To minimize travel demand and dependence on the car, facilitate walking and cycling and the use of public transport
1B	Achieving good design	Planning obligations will be sought to secure other requirements necessary to make development acceptable. (Inclusive energy efficiency)
1K	Movement and Transport	- To minimize travel demand and dependence on the car, - Facilitate walking and cycling and the use of public transport Support the movement of freight by rail or water.
1P	Waste management	- Supporting waste minimization and the provision of facilities that use recycled or composted products.

Source: adapted Cardiff UDPs (2003)

### **c) Energy Issues and Detailed Policies (Part 2) related to energy saving cities**

Part 2 Unitary Development Plan of Cardiff elaborates the general policies outlined in Part 1.

#### **i. Policy 1.A – General Principles for location of development**

As in Policy 2.A.3 the Brownfield development policies encourage mixed use and higher density development in appropriate locations, for example, where there is good public transport accessibility.

#### **ii. Policy 1.B - Achieving Good Design**

The policy of achieving a good design are based on TAN (W) 12 which advises that a well designed development should have good design attributes such as ease of access, legibility, adaptability, diversity, safety, energy and resource efficiency and local sensitivity in policy 2.B.2

#### **iii. Policy 1K: Movement and Transport Priorities**

Policy 2.K.6 highlights the priority access to be given to cyclists, public transport

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users and impaired mobility. In addition restriction measures on car use also mentioned in Policy 2.K.8.

**iv. Policy 1P:Waste management**

Policy 2.P.2 highlighted the Best Practice Environmental Option (BPEO), Sustainable Waste Management Option (SWMO), Waste Hierarchy, Proximity Principles and Regional Self Sufficiency as key drivers in the policy shift. Among these principles, Waste hierarchy approach encourages the 3 Rs (reduce, reuse and recycle) and promotes energy recovery.

**Bridgend County Borough Council**

**a) Background**

The UDP covers the whole of County Borough of Bridgend with an area of about 25,500 hectares with population of 131,671 (2001). It is located about 20km from Cardiff and encompassing Ogmore, Garw and Lynn valleys in the north and bordering the Bristol Channel to the south. The biggest settlements are the town of Bridgend and Masteg and seaside resort of Portcawl.

**b) Relevance General policies (Part 1) related to energy conservation**

Under the Part One of Unitary Development Plans of County Borough of Bridgend, policies on energy and utilities in two (2) related policies (i.e. Policy 19 and Policy 20) specifically concern with Energy Conservation. (Refer Table 2: General policies of Unitary Development Plan of County Borough of Bridgend (Part 1) related to energy conservation)

**Table 2:** General policies of Unitary Development Plan of County Borough of Bridgend (Part 1) related to energy conservation.

Policy	Aspect	Details
3	Environment	Reduction travel by private car and vehicle movement Regeneration of the urban environment
7	Transport	Increase in Public transport usage
19	Energy and Utilities	-Exploitation of renewable energy sources
20		All development proposals should take appropriate consideration of energy efficiency and water conservation in their layout, design material and construction.
21	Regeneration	Any development which are likely to put a regeneration at risk will not be permitted

Source: adapted from Bridgend County Borough 2001

Both policies explicitly discussed about energy saving measures and direction such as exploitation of renewal energy and consideration of energy efficiency measures.

This is then elaborated in the Part 2 of the UDP plan where sustainable development concept has already endorsed by most national government as guides and overriding principles towards environmental protection, prudence use of resources and also importance of economic growth, employment and also need for social progress.

Based on the aims and objectives outlined in Part 2 of UDP of Bridgend County Borough, three (3) sectors i.e. Transportation, Energy & Utilities and Regeneration, are relevant to energy saving cities are highlighted in the plan.

### **c) Energy Issues and Detailed Policies (Part 2) related to energy saving cities**

South Wales Strategic Planning Group has identified five (5) key issues in preparing Draft strategic Planning guide to be addressed by the local planning authority

- a. To reduce the need for energy by encouraging improved efficiency in

its local use

- b. To achieve self sufficiency in supply of energy in the short term by supporting the development of new generating capacity while resisting the loss of existing generating capacity which can be sustainable and economically up-graded
- c. To support the NAW in its future efforts to set realistic ‘target needs’ for energy in Wales (in general) and SE Wales (in particular) and those urgent changes needed to current planning guidance.
- d. To support growth in the local exploitation of renewable as a component of future sustainable energy strategy for South Wales and
- e. To assist sub region in becoming net exporter energy in longer term by encouraging the development of its renewals energy potential subject to the appropriate environmental safeguards being applied to future locations.

Several policies identified related to energy saving cities are in Energy Conservation and specifically in

**a) Efficiency Use of Energy**

Development which encourages the more efficient use of energy and or which conserves its supply will be favoured

**b) Exploiting Renewable Energy Sources**

Developments for exploitation of renewal energy sources and associated facilities that will not be permitted of it adversely affect the environmental interest or visually impinged upon any conservation area or natural beauty.

**c) Detailed Considerations to be assesses in exploiting energy sources**

Detailed proposals for the exploitation of renewable energy sources and their associated facilities that do not conflict with Policy U2(Exploiting Renewable Energy Sources) will be favoured provided that impact on local environment can be reduced.

Bridgend UDP policies emphasized energy efficiency, as it is specific as in Policy U1(Efficiency Use of Energy and Policy), U2(Exploiting Renewable Energy Sources). However, the additional conditional requirement spelt out in Policy U2 and U3(Detailed considerations to be assessed in exploiting energy sources) for the use of renewal energy with the list of limiting conditions make the potential of the provision of renewable energy by use of wind and solar power to be limited because of its possible visual impact.

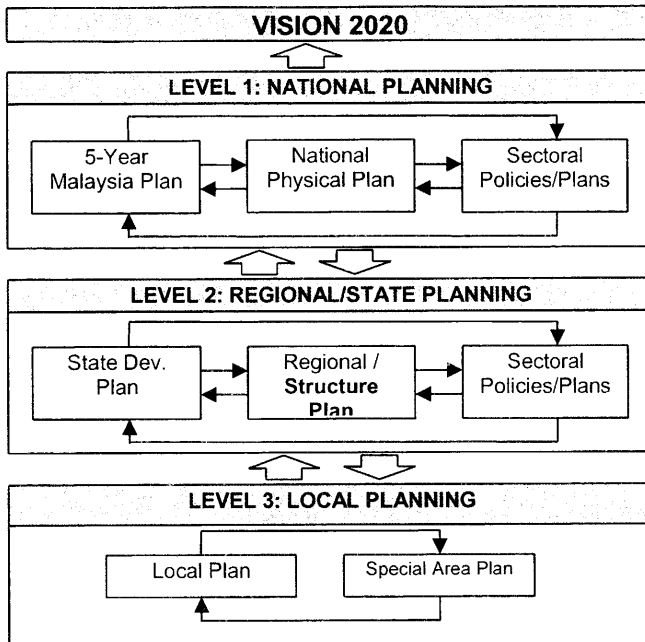
### **Energy and carbon dioxide emission considerations in the urban planning process in Malaysia**

Although Malaysian urban planning are rooted from and modeled by the United Kingdom system, there are some differences in the spatial planning framework. In Malaysia, development planning is practiced at three tiers of government as shown in Figure 4. At the national level, development planning in the country operates within the stated goals outlined in long-term Vision 2020 and the Outline Perspective Plans (OPPs), then followed by the Malaysia Plans, National Physical Plan (NPP) as well as the other sectoral policies/plans.

In this respect, spatial development is mainly guided by the NPP. In order to achieve the goals of NPP, which is to establish an efficient, equitable and sustainable national spatial framework to guide the country towards achieving developed nation status by 2020, four mutually supportive objectives have been identified as follows:

1. To rationalize national spatial planning for economic efficiency and global competitiveness;
2. To optimize utilization of land and natural resources for sustainable development;
3. To promote balance regional development for national unity;
4. To secure spatial and environmental quality and diversity for a high quality of life.

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**Figure 4:** National development planning framework of Malaysia (JPBD, 2005)

In 2006, National Urbanization Policy (NUP) was formulated to complement the NPP. NUP serves as the main thrust for all urban planning and development activities in Peninsular Malaysia including development plans at the state and local level. This policy outlines the thrusts, policies, measures and implementation plans to coordinate and manage the urbanization process of the country. It guides and coordinates the planning and urban development of the country to be more efficient and systematic, particularly to handle the rapid increase of urban population, with emphasis on balancing the social, economic and physical development within urban areas. It also serves as the foundation to encourage racial integration and solidarity for those who reside in the urban areas.

At the state level (cf. Figure 4), development is guided by the Structure Plans and sectoral policies that are articulated from time to time. Local level planning is carried out in the form of statutory development plans such as the Local Plans and Special Area Plans for the local authority areas. Structure Plans distribute the expectation of development within each state and propose major economic and infrastructure projects

for the states. The time perspective for Structure Plans is 20 years commensurate with the time perspective of Vision 2020. (JPBD, 2005)

### **Absence of Energy Consumption and CO<sub>2</sub> Emission Consideration**

Presently most of the developed countries are committed to cut down their CO<sub>2</sub> emissions as stipulated under Kyoto Protocol as well as the recent declaration during the G8 Summit 2007 in Heiligendamm, Germany (G8, 2007). In this respect, developing countries are still lapsed behind most of the developed countries. However, being a country of responsible, Malaysia, one of the fastest growing developing countries in Southeast Asia, is continuously putting aggressive efforts in combating global warming. This section examines the present efforts in controlling energy consumptions and CO<sub>2</sub> emissions in Malaysia, from the perspective of spatial planning.

As mentioned above, spatial development in Malaysia is mainly guided by the NPP. Presently, there is no specific policy related to energy conservation and controlling of CO<sub>2</sub> emissions in the NPP. However, there are several principles that have indirect implications on energy conservation, namely *Policy 3: Maximize use of existing infrastructure*, *Policy 6: Favor public transport over private transport*, and *Policy 7: Compact urban forms*.

For the case of NUP, although NUP is a comprehensive plan, there is also no policy directly referred to energy conservation and reduction of CO<sub>2</sub> emission. Policies that may have indirect implications on energy planning are found in Policy Thrust 1 and Policy Thrust 3 as follows:

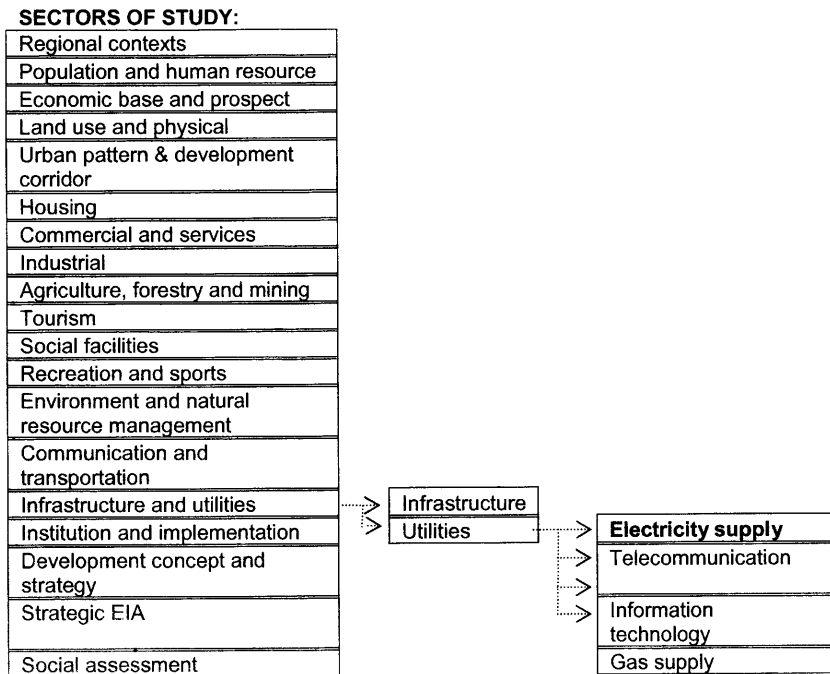
- Thrust 1 : Towards an efficient and sustainable urbanization
- Thrust 2 : Development of a resilient, dynamic and competitive urban economy
- Thrust 3 : Towards an integrated and efficient urban transportation system
- Thrust 4 : Provide quality urban services, infrastructure and utility
- Thrust 5 : Create a conducive urban living environment with a distinct identity
- Thrust 6 : Effective urban governance

Part of *Policy Thrust 1 - Towards an Efficient and Sustainable Urbanization* highlighted the policy to promote national growth conurbation policy, and specific conurbation

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zones have been identified. The advantage of the national conurbation policy in term of energy conservation is that it promotes economic of scale and energy efficient system of these designated growth regions. Compact city development can be developed to optimize energy utilization in the region by reduction in movement and transportation energy.

*Policy Thrust 3 - Towards an Integrated and Efficient Urban Transportation System* promotes an integrated and efficient urban transportation system. As transportation sectors consumed more than a quarter of the total energy consumption in Malaysia, an efficient and comprehensive transportation system is vital. The current pressing issues are increasing in private car ownership and low utilization of public transportation. The policy thrust promotes the use of integrated public transportation system emphasizing on multi-modal transportation terminal, implementation of TOD development, provision of Park and Ride Terminals, use of environmental-friendly vehicles to reduce air pollution.



**Figure 5:** Energy sector (electricity supply) was a sub-sector under the utilities sector in the Johor Structure Plan 2001-2020 study (JPBD, 2001)



For the State and local levels, in the process of the preparation of Structure Plans and Local Plans, energy sector study very often focuses on fulfilling the energy demand rather than investigating measures to reduce the city-wide or region-wide energy consumption through an integrated approach. For example, in the study of Johor Structure Plan 2001-2020, energy sector was considered as one of the sub-sectors under the utility sector, but the study was in fact focusing on electricity supply rather than energy demand and supply as a whole (cf. Figure 5). Besides, energy issue was neglected in the environmental sector despite that the two most essential issues, energy and CO<sub>2</sub> emission, which have been widely recognized as global environmental issues that require immediate attentions from all parties.

On a whole, spatial planning framework in Malaysia should give more serious considerations on the issues of energy consumptions and CO<sub>2</sub> emissions. Although there are some policies in the NPP and NUP indirectly favor energy conservation, there is still no measure that directly focuses on promoting energy conservation/efficiency and capping CO<sub>2</sub> emission. Moreover, instead of promoting energy conservation/efficiency, in most of the Structure Plans, focuses are in fact put on fulfilling the continuously increasing energy demand so as to support the desired high economic growth rate

## **Conclusions**

The empirical cases in UK have shown that the local authority strong willingness to act on this issue to integrate energy in forward planning and development control is important beside the statutory requirement. The recent UDPs in UK in all the 2 case studies showed the attempt to incorporate energy conservation policies in the UDPs irrespective the larger county such as Cardiff and the smaller one such as Bridgend.

In the case of Malaysia, although sustainable development concept has been accepted as a national policy in our settlement planning, our current State Structure Plans in Johor, Pahang and Selangor do not show any reference to energy conservation other than utility study on electric supply.

In term of Energy policy in Malaysia, the Ministry of Energy, Communications and Multimedia proposed Five Fuel strategy to replace the Four Fuel /diversification Policy in year 2001 (KTKM 2003). Under the new strategy, the Four Fuel diversification policy

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which comprises oil, gas, hydro and coal is to include Renewal Energy (RE) as the Fifth Fuel. Biomass has been identified as one of the most promising among all the different sources of RE. In addition to intensify the use of RE, Small Renewable Energy Program (SREP) was also implemented in 2001 to promote the growth of small power generation plants that utilize Renewable energy. This can also facilitates the implementation of grid connected renewable energy. In addition, promotion of Energy efficiency (EE) to encourage efficient utilization of energy particularly in the industrial and commercial sector was one of strategies cited in the Eight Malaysia Plan (2001-2005). However, many of the measures in promoting utilization of energy focused mainly on energy efficient building (PTM 2005) and not at a broader scale (city or regional levels). The implementation of Renewal energy and Energy efficiency measures should also be taken up at the development plan level so that local authorities can ensure approved development has already considered them. Hence it is important for the Federal Town and Country Planning department to work closely with Malaysia Energy Centre, Ministry of Energy, Communications and Multimedia so that the EE and RE policy can be translated into spatial policies.

Land use planning at National, state and regional level has a role in achieving the objectives of energy efficiency in long term. Greater integration between land use, transportation and energy supply (including RE) and conservation is important ingredient towards planning for sustainability. Energy conscious land use planning may not be sufficient for the improvement of urban energy efficiency. It had to be comprehensive encompassing policies related to other sectors such as transport, housing, industry, renewal energy and environment. Land use planning must be set within the context of local, national, and even at international policy frameworks employing the wider range of policy instruments. It needs to consider public and private investment, information, fiscal measures and regulation.

Policies statement in the case of Cardiff and Bridgend also shows that planning sectors such as Environment, Transport, Energy & utility and Regeneration can incorporated the energy efficient city principles in the preparation of development plans.

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