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June 13th 2014

Electricity Reviews Division

Environment Bureau 15/F East Wing Central Government Offices 2 Tim Mei Avenue Tamar Hong Kong E-mail: <u>fuel_mix@enb.gov.hk</u>

Dear Sir/Madam,

Response to the Public Consultation on "Future Fuel Mix for Electricity Generation" Views from The Canadian Chamber of Commerce Hong Kong

In response to the public consultation document on *Future Fuel Mix for Electricity Generation* ("consultation document"), the Canadian Chamber of Commerce in Hong Kong ("CanCham") is of the view that the future fuel mix for electricity generation in Hong Kong is an important decision that will shape the city's future energy policy. It affects not only its power industry, but also the entire economy. Based on the information given in the consultation document and on other sources of public information we have reviewed, we believe that increasing local gas generation will be the pragmatic and effective way to improve both local and regional air quality to meet the HKSAR Environment Bureau ("Government") policy targets by the early 2020s. The question of whether Hong Kong should build a designated transmission line to increase the importing of electricity from the China Southern Grid Co. Limited (CSG) needs further review and analysis before CanCham can provide a qualified and informed opinion on the matter.

The CanCham Sustainable Development Committee ("SDC") has provided leadership in advocating the business case for sustainability in Hong Kong for close to two decades. Our members are committed to actively promoting a sustainable future for Hong Kong – this includes taking care of our environment and managing our day-to-day business sustainably.

Founded in 1977, CanCham is a proactive, non-government body that provides an extensive networking platform for some 1,100 members with business interests in Canada, Hong Kong, Mainland China, and the broader Asia-Pacific region. CanCham is one of the largest Canadian business organizations outside of Canada, one of the leading and most active international chambers in Hong Kong, and an influential business group in Asia-Pacific.

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Overall, CanCham supports Option 2, but with the condition that more effort should be devoted to developing local renewable energy and promoting energy efficiency and conservation (EE&C). We offer a more detailed review of each option based on the criteria set out in the consultation document and explain our viewpoints in the paragraphs below. The CanCham response to 'Specific Questions for Consultation' is provided in the Appendix.

Yours sincerely,

John Witt Chairman Canadian Chamber of Commerce in Hong Kong

CC

Mr KS Wong, Secretary for the Environment, HKSAR Ms Christine Loh, Under Secretary for the Environment, HKSAR Mr Philip Leung, President, Canadian Chamber of Commerce in Hong Kong Mr Hendrik Rosenthal, Chairman, Sustainable Development Committee and Director (Non-Executive), Canadian Chamber of Commerce in Hong Kong

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EXECUTIVE SUMMARY

CanCham members view reliability, safety and environmental performance as the most important criteria for Hong Kong's electricity system.

Due to insufficient information given in the consultation document, CanCham has reservations towards expressing support for importing electricity from the Mainland (Option 1). More concrete information needs to be made available, in particular relating to reliability of supply, affordability (cost and tariffs), and environmental impacts (carbon content and air emissions of imported electricity). Given the lack of other options to choose from in the consultation, we consider local generation with natural gas (Option 2) to be a more logical and less risky choice to support – however, Option 2 by itself is not perfect either.

The consultation document offers no supporting evidence for satisfactory performance of Option 1 in terms of reliability. Option 2 has more certainty in this area. More details and discussions are needed to understand more about any reliability and safety impacts the import of electricity from the Mainland grid may have before we move away from the proven mode of local generation.

In terms of environmental performance, there are concerns that Hong Kong is merely shifting local emissions to the Mainland and that there would be no genuine improvements in regional air quality and carbon emissions. Although Option 2 uses more natural gas and is still a fossil fuel, there is more control and certainty on emissions performance, not only locally but also from a regional perspective.

In addition, CanCham is of the opinion that renewable energy has not been given an appropriate role in the future fuel mix proposed by Government. Viable renewable energy projects should be pursued wherever sensible, and therefore a target renewable energy proportion should be integrated into the mix. In addition, CanCham believes that Government can do more to raise public awareness through education, public campaigns, and to incentivise more innovation and adoption on energy efficiency and conservation (EE&C).

In terms of the impact on local industry, we believe that Option 1 may have impact on the ability to retain engineering talent in Hong Kong and may incur loss of economic activity, because a significant portion of power generation business would be shifted into the Mainland permanently.

In summary, in absence of more detailed information on the impact on reliability, regional environmental performance and affordability of importing electricity from the Mainland grid (Option 1), CanCham supports that any change in Hong Kong's fuel mix is supported by cleaner local gas generation as proposed in Option 2 but supplemented with renewable energy and EE&C.

Reliability and Safety is No.1

The reliability of Hong Kong's electricity supply ranks amongst one of the best in the world. It has been a strong pillar for Hong Kong's economic and social development for decades. Most notably, the cost for this high reliability in our electricity supply is competitive, attracting industries and investors from all around the world to expand or headquarter their businesses in Hong Kong – which is evident in the flourishing growth of many industries here such as banking and finance, marine and aviation, logistic and public transportation, hotel and tourism, as well as the fast-growing data centre business. When deciding on the future generation fuel mix, we must ensure that this high level of reliability is not compromised. For example, a high level of reliability is essential to help ensure Hong Kong remains a financial hub where market participants are assured financial transactions can be completed in real time and markets will not be closed due to power interruptions which can cause both financial and reputational damage. Reliability also affects safety in Hong Kong where a substantial portion of residents live in high-rise buildings and rely on power to access the upper floors on a day-to-day basis. Reliability is also central to the substantial number of commuters who use the MTR each day.

In view of Government's proposals, Option 1 (importing more electricity through purchase from CSG) is untested in Hong Kong and the reliability of CSG's grid within the Pearl River Delta still lags behind that of Hong Kong's. The supply and reliability of electricity in Guangdong Province has been one of the concerns of many businesses that have been located there for years, although the situation has seen improvements in recent years. Yet, regional blackouts caused by adverse weather are still not uncommon in Southern China and the Pearl River Delta. Macau is often mentioned by Government as an example of a preferential agreement made with the Mainland to maintain its high supply reliability. However, despite the different circumstances and therefore the different consequences of electricity interruptions between the two cities, this also raises a moral question of whether it is appropriate by allowing others to go black in order to keep our lights on. We should also question how much this "privilege" of reliability would cost, and for how long after 2047 it could last, when Hong Kong may no longer enjoy a preferential status compared to other Mainland cities.

Comparatively, Hong Kong's power system has performed remarkably well over the years, despite frequent typhoons and other extreme weather conditions. Local generation allows Hong Kong to have better control over the electricity supply and quicker response in case of any system contingency, which further enhances the supply reliability. Cancham believes that we must be cautious on whether we would like to give up this high level of autonomy in electricity supply.

In terms of safety performance for Option 1, we express concern about whether the safety risks of power generation would simply be outsourced to a company outside Hong Kong that as stakeholders we would have no control over. While for local generation under Option 2, the safety performance of the power companies can be well-regulated and monitored effectively by Government and Hong Kong stakeholders.

To sustain Hong Kong's remarkable business environment, we should not make any decisions about our future fuel mix that may compromise our excellent reliability and safety performance. More details and discussions are needed to understand more about any reliability and safety impacts that Option 1 may have on Hong Kong before we move away from the proven mode of local generation. In particular, how the overhead electric grid in Guangdong could survive under extreme weather like super typhoons, exceptional thunderstorms, and even snow storms without affecting their reliability and robustness in supplying to Hong Kong is something that must be answered before Option 1 can be considered.

Cost and environmental concerns - more information is needed for decision

Based on the minimal information available in the consultation document, it is challenging to state a preference for one of the two options. A recent survey conducted by Business Environment Council pointed out that the lack of information was one of the major obstacles to creating public buy-in for changing the fuel mix.¹ Taking generation cost as an example, the consultation document simply mentions the unit generation cost for both options would be roughly double that of the average from 2008 to 2012. However, since this estimation is probably based on various assumptions, more details about this cost estimate should be disclosed.

For importing more power from CSG, CanCham believes that the import purchase cost may not be appreciably influenced or controllable by Hong Kong. When considering tariffs, the Mainland power sellers are expected to take into account their own generation costs, the cost for building new infrastructure for power transmission, the network operation and maintenance (O&M) cost, their expected profit margin for selling out power with reliability higher than their own one, as well as other elements such as value-added taxes (VAT) or potential carbon-related "tax" and similar costs. These costs are not controllable by Hong Kong and the reflected tariff would largely depend on the bargaining power of Hong Kong, which may not be appreciable since it would be a "single seller" situation. For Option 2 (local generation by natural gas), while the actual tariff would depend on the infrastructure costs for building new gas generation facilities, the generation and O&M costs are more controllable. In both options the tariff would largely depend on the price of fuel, whether that be coal, gas or renewable resources. Instead of saying both options would roughly double the generation cost, it is more prudent to say that the expected costs under both options are unclear. As for the aspect of environmental performance, it is also hard to tell which option is better. For importing power from the grid under Option 1, local emissions can be effectively reduced by "shifting" the power generation to the Mainland. However, this raises a moral question whether this would just be a NIMBY (Notin-my-backyard) approach of sending away the emission to the Mainland. It should be noted that Guangdong itself has very little renewable energy. As China as a whole has a direction of decarbonisation and air quality improvement in the next 10 years, it is likely that China is already doing its best in development of renewable energy resources and additional electricity demand from Hong Kong would be supplied from other non-renewable generation sources such as coal generation - similar to what Guangdong has been doing with Macau. In addition, it is not certain whether overall regional air quality would improve, especially when the major fuel in Mainland China is still coal now and expected to be so for the foreseeable future. Furthermore, we should not neglect the possible costs that local business may incur due to the increase in Scope 2 emissions if power is purchased from CSG under Option 1.

Natural gas is a fossil fuel that generates CO_2 and emissions, and should be regarded as a transitional fuel in light of efforts to combat climate change. In the long run, we still have to pursue energy substitutes that are more sustainable and emissions free. But in the current planning horizon (up to 2023) Option 2 can provide more control and certainty on emission performance and has the advantage that Hong Kong is in a better position to control the source of fuel for power generation.

¹ See the BEC 2013 Hong Kong Business Survey on Energy Efficiency & Climate Change available here: <u>http://www.climatechangebusinessforum.com/en-us/research-11102011</u>

Fuel diversification and the potential of more renewable energy (RE)

The existing diversified fuel mix made up of coal, natural gas and nuclear power, has served Hong Kong well for decades in terms of safety, reliability, affordability and environmental performance. Under Option 1 (connecting to CSG), the consultation document states that Hong Kong would gain access to cleaner fuels. However, with China doing its best to develop renewable energy resources to clean up the environment, it is not certain there would be additional incremental renewable energy to supply Hong Kong. Hence, if the incremental demand of Hong Kong is not being met by incremental clean energy projects, it is merely a "feel good" factor without actually contributing to lower air pollutant or carbon emissions.

It would be optimal if transmission lines could be built to directly tap RE sources to ensure the electricity generated is from a specific RE source rather than just purchasing from a power grid where a significant part of the fuel mix is comprised of coal. It would be helpful if Government could supply additional details about the reasons why a dedicated transmission line, similar to the current arrangement for the Daya Bay Nuclear Power Station, is not feasible and not mentioned in the consultation document.

Alternatively, if more reliance on natural gas under Option 2 were to be pursued, we have to be aware of limited fuel diversification in the future. For instance, Japan in the past managed its fuel mix policy to limit any particular fuel source to no more than 30% in order to strengthen reliability. However, after the Fukushima incident Japan shut down most of their nuclear plants and had to rely heavily on importing LNG from all around the world and keep other fuel sources such as coal, oil and renewables in their fuel mix to maintain a higher level of fuel diversification. Thus, gas supply diversification is very important to support competitiveness and can be achieved through LNG imports from world markets. However Hong Kong requires appropriate infrastructure to enable imports from world markets.

The consultation document allows for 1% of RE for both fuel mix options, based on *"natural constraints, and geographical limitations"* in Hong Kong. Presumably this statement includes the lack of land and the absence of large-scale hydro, biomass and geothermal sources of RE. Globally, around 17% of final energy is from RE. After excluding large-scale biomass and geothermal sources of RE, this percentage becomes just under 2%. Although there are cost and space implications, there is an opportunity for Hong Kong to increase the RE for the future fuel mix. CanCham recognizes the large space requirements for renewable energy but viable projects should be pursued wherever sensible and a target renewable energy proportion should be integrated into the fuel mix. Given that the two power companies have already gone through the critical feasibility evaluation process of their proposed offshore wind farms, together with the Government's policy plans to increase waste-to-energy developments in the coming decade, over 3% of Hong Kong capacity could be produced by local renewable energy projects. CanCham urges Government to pursue these projects because it would demonstrate Hong Kong's commitment to sustainability and will not add a significant cost burden on consumers.

Flexibility in scaling up future supply and potential impact on local industry and economy

Based on consumption records from the last few years, the electricity demand growth in Hong Kong has been modest or even dropped in 2013, in part due to increasing public awareness and adoption of EE&C practices. It is therefore worth considering flexibility in scaling up our supply capacity when deciding the future fuel mix. Under Option 1, if an interconnector is built with sufficient excess capacity (which presumably comes at a cost), then the incremental demand increase (if any) can be met easily via additional

imports through this interconnector. However, if there is limited interconnector excess capacity, it is very difficult to scale up future electricity supply for Hong Kong given the need for another piece of interconnector infrastructure. But building extra reserve margins in one go for such a large piece of cost infrastructure may risk turning out to be a white elephant if Hong Kong manages to cut down our energy consumption through future EE&C projects. Option 2 is generally easier to scale up given the modular nature of natural gas generation units, allowing for deferral of capacity increases until the impacts of EE&C efforts show effectiveness.

In addition, Option 1 may impact the local power industry, because a significant portion of the power generation business would be shifted into the Mainland permanently. This would likely result in the loss of local technical engineering skills and talent. There would also be a potential loss of corporate tax revenue if part of the electricity services value chain (not just the power companies, but the associated consultants, suppliers, contractors, etc.) were to be provided by a company based outside Hong Kong.

Implication on a post-2018 electricity market

Government has indicated that the fuel mix decision would have an implication on the post-2018 electricity market. Government noted that Option 1 may provide more room to introduce change to the electricity market while details need to be further studied in the post-2018 market regulatory framework review. There are many questions yet to be answered for this subject, including some obvious ones:

- How would any market change impact Hong Kong in terms of reliability, environmental performance and electricity costs for consumers?
- What are the costs and benefits that market change would bring? Can such benefits be more economically implemented under the existing and other alternative regulatory arrangements?
- How would the CSG and Hong Kong electricity sector be arranged? How would they interact?
- Would there be a level playing field for Hong Kong and Mainland companies? Would all companies be subject to the same legal, environmental and oversight requirements?

We understand there are many unanswered questions on this complex topic and there will be a separate public consultation on the future of Hong Kong's electricity market. CanCham looks forward to future discussions in this area.

More Focus on Energy Efficiency and Conservation (EE&C)

Apart from planning ahead for a better fuel mix, the adoption of EE&C is also critical for the success of future energy policy. With proper adoption of EE&C, load growth can be slowed and the need for building new generators could be deferred. Hong Kong has been promoting EE&C for years and its elements are becoming more important in many buildings nowadays. Yet, CanCham believes that Government could still do more to raise the public awareness through education, public campaigns, and to incentivize more innovation and adoption on EE&C. By using energy more wisely and efficiently, global climate change can be mitigated and consumers could save significantly on energy bills.

Concluding Remarks

In summary, CanCham supports a cleaner fuel mix for a more sustainable Hong Kong while maintaining the current level of supply reliability. We believe that Hong Kong's current high level of supply reliability is crucial for its businesses and residents. Therefore, we should not make any decisions on our future fuel mix that would compromise this high reliability.

In terms of emission performance, increasing imports from CSG to Hong Kong would merely transfer our responsibility and pass our emissions elsewhere – air pollution and carbon emissions know no boundaries and is a regional and global issue. Option 2 (local generation) will help Hong Kong to improve local air quality and contribute to the greater PRD by cutting down overall regional emissions.

Based on the consultation document, cost is projected to be similar between Option 1 and Option 2. Therefore, Option 2 is assessed to be the preferred choice given the uncertain reliability impact and lack of control in regional emissions performance in Option 1. Natural gas import infrastructure should also be improved to allow Hong Kong the flexibility to source natural gas from around the world.

We believe the future fuel mix should also increase renewable energy. We also suggest Government to put more efforts on EE&C, in order to support Hong Kong's competitiveness in the long run. The option of importing electricity across the boundary should only be considered if there is surplus clean energy available for supplying to Hong Kong. Unless this is the case, Hong Kong should continue to move its fuel mix towards cleaner local gas generation as per Option 2.

Appendix – CanCham Response to Specific Questions for Consultation

Q1: How do you view each of the two fuel mix options with regard to safety, reliability, cost, environmental performance and other relevant considerations? (Please indicate your view on EACH of the two options.)

Option	Support	Not Support	Reason for NOT supporting (You can tick more than one box)
1			✓ Safety ✓ Reliability ✓ Affordability ✓ Environmental performance ✓ Others (please specify):
2	V		Safety Reliability Affordability Environmental performance Others (please specify):

Q2:

Which of the two	fuel mix options do yo	u prefer? Why? (P	lease tick ONI	Y ONE box)
Option 1				
Option 2	\checkmark			

Reasons: (You can tick more than one box below)

Safety	\checkmark
Reliability	\checkmark
Affordability	
Environmental Performance	$\mathbf{\nabla}$
Others	\checkmark

Please specify: Please refer to the detailed submission paper attached.

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請於2014年	6月18日或之前透過以下方式提交你的意見。	
郵寄地址:	香港添馬添美道二號政府總部東翼十五樓環境局電力檢討科	
電子郵件:	fuel_mix@enb.gov.hk	
傳真:	2147 5834	



第二部分

燃料組合

		制入		天然重 22%	煤 (及可再生能源) 55% ^{**}
燃料組合 現時 (2012)		核能 (大亞灣核電站)	從電纜跳電 -		
		23%			
通過從內地電 網購電以輸入 更多電力		20%	30%	40%	10%
		成功	50%		
方案2*	利用更多天然 氧作本地發電	20%		60%	20%

*以上的燃料比例用以提供一個基礎作調整電力供應所需的基礎。不同燃料的實際分配果該實驗借記算定。

**包括少量燃油 •

92%

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第三部分

具體諮詢問題

問1: 就安全、可靠性、合理價格、環保表現及其他相關的考慮而言,你對兩個燃料組合方案 有何意見? (請就每個方案説明你的看法)

方案	支持	不支持	不支持方案的原因 (可選擇多過一項)
1			 □ 安全 □ 可靠性 □ 合理價格 □ 環保表現 □ 其他 (請註明):
2			 □ 安全 □ 可靠性 □ 合理價格 □ 環保表現 □ 其他(請註明):

問2:你認為在兩個燃料組合方案中,哪一個較理想?為什麼?(請只選擇一個) 方案1

方案2 □

原因: (可)	展探多	過一項)	
安全			
可靠性	n		
合理價格			
噶保表現			-
其他		請註明:	

第四部分

其他意見或建議

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· 港九電器工程電業器材職工會

就 (未來發電燃料組合) 諮詢文件的意見

政府就《未來發電燃料組合》的公衆諮詢文件中的序言強調「要讓香港 得以持續發展,我們必須確保市民能在合理的價格下獲得安全及可靠的電力 供應。」這點本會贊同,作為電器業界中的重要持份者-----前線作業人員組成 的職工會,我們必須強調「用家要有可靠的電力供應,這與完善的輸配電系 統和安全的電力裝置等密不可分,這不是唾手可得,必須付出成本!」

事實上,與不同地區比較,本港現時電力供應的可靠度,安全度及電費 之合理均名列前茅,環保之表現所衍生的空氣質素的問題,我們當然重視! 但啼笑皆非的是,當就「空氣質素」與「電費加幅」相提並論時,基層工友 們幽默地說「原來這就是用者自付的政府政策!」

諮詢文件中所職列的兩個方案都未儘如人意,而我們亦沒有更佳的方案 提供,作為業界中的持份者,我們認為未來發電燃料組合怎樣發展都應恪守 以下原則:

1) 任何時候採用任何方案皆需保障包括電力公司職員之本港勞工的就業:

- 2) 安全,可靠的電力供應必須是持續有效:
- 3) 合理的電費水平:
- 4) 仍需加強節約用電的宣傳及教育,倡導低碳生活;

5) 空氣潔淨的成果需多方面配合,「置換效應」不能解決實質問題:

6) 有序且實效地使用更多再生能源。



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香港餐飲聯業協會有限公司(餐飲聯)17 JUN 2014

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<未來發電燃料組合>意見書

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香港家有美食之都的美譽,2013 年全港餐飲業總收益超過 900 億元,約有 16,000 閩餐飲服務 企業,為本地提供 23 萬以上就業職位。餐飲業如其他服務行業般,在業務營運中面對各項嚴 較挑戰,例如:工資、舖租,食材價格的不斷上升,已為餐飲業增加沉重壓力,還有陸續推 行的收費政策,例如:飲品玻璃樽生產者責任計劃及都市固體廢物按量收費等,都會令餐飲 營運雪上加霜,而電力服務對於餐飲企業的基本營運及維持服務質素方面極為重要。本會就 政府發表「未來發電燃料組合」 諮詢文件提出意見。

餐飲業對電力供應最魚要是可靠、安全、合理價格和整體環境保護,就語詢文件方案1 通過 向內地電絕購單以輸入更多電力,本會對此方案予以保留,根據<2013-2014 年世界競爭力報 告)香港供電質量獲評為全球第一,平均每年停電約少於三分鐘,而南方電網全年平均停電 達 138 分鐘,雖然兩地電網覆蓋範圍不同,但亦具參考作用,另外,內地發展急速城市化, 對電力需求與日俱增,增添內地電網不穩變數,業界擔憂將原有高度可靠供電優勢,轉為相 較未符要求的電力供應,除影響餐飲業務外,其他行業以及民生小會受到影響,本會非常關 注未來供電的可靠性/穩定性對業界帶來的影響。

香港地小人多和大廈林立,據統計香港有半數人口以上生活或工作於 15 層樓以上,而現時餐 飲企業除地舖外,亦有不少在多層大廈內營業,餐飲從業員及顧客主要是使用升降機或電動 樓梯上落,故供電安全也應顧及電力故障對使用者所構成的危險,穩定可靠電力供應,對餐 飲從業員、顧客和市民大眾安全均有所保障,本會提出應慎重考慮因電力供應故障,可能構 成之危害風險,以致引起社會混亂及不利勞商環境。

據諮詢文件估計從電網購電的成本,增幅約為現時1倍,此增幅只計算輸入電力的成本及建 設所需的跨境輸電設施的投資,但其他如設置防境輸電基建(估計約200億-300億), 定程 度的本地後備發電容量所需的投資、輸電和調峰管理費用、客戶服務與及其他支援服務等成 本,仍未計算在內,另外,還有並未包括購電價格上升的考慮因素,參照澳門向內地購電質 例,2008年至2013年間購電價格上升約27%,故推算方案1之電價升幅必在1倍以上,什 至高達2至3倍。





| 香港餐飲聯業協會有限公司 (餐飲聯)

餐飲業面對租金高、人工高、食材高的三高營運,已經營困難,利潤只有收益的2%,而僅費 佔營運成本4-5%,若電費以倍數上升,勢令業界電力成本競升至15-20%,實令餐飲企業營運 無利可圖,本會認為電力費用升幅亦要充分考慮業界的承受能力。

諸詢方案其中目標是降低香港空氣碳強度水平,以速致預期環保表現,網電方案從內地購電 以減少本港燃煤發電比例,據諮約文件顧示化石燃料佔南方電網約6成發電,故向南網購電 只會出現「置換效應」加大內地的碳排放量;其次方案是以潔淨能源減低燃煤所產生的污染, 而南方電網內包含非化石和化石燃料產生的電力,不可能劃分潔淨電能輸港的操作。最終榮 界要付上高昂電費及加重營運成本,只換來「置換效應」和使用非潔淨電能,完全未能透到 真正減少碳排放的環保目的。

為符合法定排放上限,香港已計劃於2015年將現時22%天然氣發電增加至40%,而方案2則 進一步增加本地天然氣發電至60%,以減少燃煤發電,電費成本升幅亦為一倍,綜額在基礎 設施方面、安全方面、供電可靠性/穩定性方面和環保表現方面皆較易掌控,惟獨價格方面, 天然氣價格和升幅波動直接影響電力收容,令業界擔憂電價及上升幅度過高,以致營運成本 壓力大增,影響生計。

總結:

本會非常關注穩定電力和低廉電價收費。多年來,餐飲企業積極透過安裝節能設備、教育員工、改變用電行為,以減低日常用電開支,安全可靠的電力供應和合理的電價對餐飲業以至 民生非常重要,應在環境保護、營商和社會民生當中取得平衡,就諮詢文件在欠缺詳細資料 和數據的情況下,實難以作出選擇。

本會建議政府應積極爭取,將大亞灣其餘3成電力轉输香港,以減低未來電價上調的壓力, 在「未來發電燃料組合」中核電的比重由20%增至30%,而天然氣比例則由2015年起40%使 用量增至後來50%,以減少天然氣價格波動對電價的影響,餘下20%為煤及可再生能源發電。 盡量避免電價壓升與及電力不穩定因素,而打擊營商環境和影響社會民生。

長還而言,電力供應引入競爭或開放市場,以提供更多選擇和維持合理電價是可考慮方向。 若內地電纜在可靠性/穩定性,可持續性及電力價格均符合本港電力市場要求水平時,從內地 電網購電亦是其中可考慮方案。

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香港餐飲聯業協會有限公司(餐飲聯)

「香港餐飲聯業協會」簡介:

香港餐飲聯萘協會(簡稱餐飲聯)是一個由餐飲業及有關聯業管理人士聯合組成的 政治中立及非牟利團體,自1999年創會至今,均致力以團結業界、凝聚力量及 推廣餐飲業務發展為宗旨,會員遍及中式酒樓、西式及特色餐廳、連鎖式食肆、 茶餐廳及飲食聯業的公司、經營者、管理層等,現時會員機構逾800多間。

12/06/2014

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Electricity Reviews Division Environment Bureau 15/F, East Wing, Central Governmeth Offices, 2 Tim Mei Avenue, Tamar, Hong Kong

Advance copy by fax : 2147 5834 and e-mail : fuel_mix@enb.gov.hk

June 16, 2014.

Dear Sirs,

Reference to the public consultation document issued by the HKSAR Government regarding the "Future Fuel Mix for Electricity Generation", on behalf of the Green Business Committee (thereafter named GBC) under the French Chamber of Commerce and Industry in Hong Kong (thereafter named FCCIHK)we are delighted to submit this paper for your review.

Both GBC and FCCIHK are comprised of individual and corporate members. Thus, you can consider our response as a collective response from respective members coming from a diversity of background.

Fuel Mix Options:

In our opinion, it is important to strike a balance among different objectives when choosing the preferred option. The objectives as listed by the government in the consultation paper are indeed reasonable and obvious. As for the option, we suggest a hybrid system subject to further Fuel Mix elements should be considered.

For business owners, we prefer both reliability and lower cost of operation. As an advocate in green business, we encourage more investment in environmental protection in order to make our life and community more sustainable in the long run.

No doubt, the reliability record and professional standard demonstrated by the current 2 power companies provide a strong level of confidence to people reside in and corporations operate in Hong Kong. To promote environmental protection such as

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using alternative fuel, applying high standard technology, practicing best and professional practices; it requires investment and long term vision. Government should take a more holistic approach to define the policy and to set the right direction.

We will also explain in more details at the "Other Comments and Suggestions" part.

Specific Questions for Consultation:

In terms of factors in selecting the preferred options, we consider the following as critical and important in descending order: 1. Safety; 2. Reliability; 3. Affordability; 4. Environmental Performance; and 5. Sustainability when considering any possible fuel mix options.

Other comments and suggestions:

There are indeed more room for improvement riding on the upcoming negotiation between the Government and the 2 power companies. For instance, both the Government and power companies should set progressive targets in consuming alternative fuels besides natural gas. There are a number of options indeed and the government should maintain more an open mind to consider alternative fuels from other sources. GBC would strongly suggests stakeholders to approach this issue in a more holistic manner.

Municipal Solid Waste (MSW) in Hong Kong is indeed another tough issue while we will soon run out of landfill capacity for disposal, we are lacking other means of waste treatment, and indeed very slow in materializing policy and approval of the necessary infrastructure. This in turn calls for a new manner to define waste as an alternative source of energy.

First of all, energy recovery from waste is part of the non-hazardous waste management hierarchy. Converting non-recyclable waste materials into electricity and heat generates a renewable energy source and reduces carbon emissions by offsetting the need for energy from fossil sources and reduces methane generation from landfills. For example, there are about 86 facilities in the United States for combustion of MSW, with energy recovery features producing 2,720 megawatts of power per year by processing more than 28 million tons of waste per year. (Note 1)

In 2012, Hong Kong generated as much as 5.56 million tonnes of waste (Note 2) which presents a good potential alternative source of energy. With the proper design, installation and operation, consuming Waste as an alternative fuel will help the



community to solve both Energy and Waste issues at the same time. Not only will this be safe, reliable, affordable and environmental friendly to generate green energy, it is a good initiative to promote sustainable circular economy here in Hong Kong. The followings are some practical examples to consider.

(A) Landfill gas:

Landfill gas (LFG) utilization is a process of collecting, processing, and extracting gas giving off as a result of microorganism decomposition in putrescible waste, the gas comprises methane which is an effective energy commodity. Currently, LFG has been recovering as fuel at NENT (7,336 m³/hour), SENT (1,751 m³/hour) and WENT (3,996 m³/hour) landfills on the uses of:

- + Supplying electricity for on-site consumption in buildings and infrastructures;
- + Powering leachate treatment plants;
- Substituting naphtha as a heating fuel for town gas production after removal of carbon dioxide (CO₂, various other chemical and trace compounds in NENT.

There are recommendations that landfill gas may also be used in fuel cell technologies, which use chemical reactions to create electricity, and are much more efficient than combustion turbines. (Note 3)

ADVANTAGE:

- LFG is a naturally induced, readily available and constant resource as long as landfilling activity remains active or even years after the end of lifespan, the costs of generation or collection via pipelines are significantly lower than most other options such as coal-fired or renewable energy set up that incur huge capital costs and space.
- Another benefit it brings is reduction of greenhouse gas (GHG) emission that otherwise needs to be directly released to the atmosphere or flared at high temperature with extra drive of energy. Towngas estimates the project in NENT cuts the emission of CO2 by 135,000 tonnes annually since 2007. (Note 4)

(B) Refuse Derived Fuel (thereafter named RDF)

Waste from respective source can be re-used as a fuel source. RDF is a fuel produced by shredding and dehydrating municipal solid waste (MSW) with a Waste converter technology. RDF consists largely of combustible components of municipal waste such as plastics and biodegradable waste. RDF can be used in a variety of ways to produce electricity. It can be used alongside traditional sources of fuel in coal power plants or even other industrial application.

(C) OWTF Biogas off-take



The government plans to build five to six small to medium size Organic Waste Treatment Facilities (OWTF) adopting anaerobic digestion technology in order to treat organic waste and turn it into biogas and some compost as by-product. Anaerobic digestion is a more stable process for medium, and high strength organic effluents. Centralized treatment facilities like OWTF can also ensure the benefits economy of scale in terms of generating and reuse of more power. It is estimated that for the first phase of OWTF (200 tonnes capacity), about 14 million kWh of surplus electricity can be supplied to the power grid per year, which is adequate for use by 3,000 households, contributing to reduction of 25,000 tonnes per year of GHG emission.

ADVANTAGE:

- Organic waste is unavoidable in metropolitan cities and biogas is often produced from materials that form sewage and waste products, which makes biogas considered renewable and clean power;
- f Biogas has been practically used as a fuel source for electricity generation and industrial/domestic heating.
- Many countries have already enforced landfill ban, forbidding food waste from being dumped in landfills. Diversion of organic waste from landfills saves up space, also controlling potential land, soil and water contamination due to improper handling.

(D) IWMF power off-take

Modern incineration or waste-to-energy is also a proven and time-test mass-burn technology that is considered safe, clean, and widely applied in economically and technically advanced countries around the around.

Singapore's waste management facilities have now achieved high efficiency as its "waste-to-energy" program has become a profitable business. With population of 5.31 million, the country generates 19,862 tonnes of solid waste per day, similar volume to that of Hong Kong. According to the National Environment Agency, Singapore's four incineration facilities can produce 2,688 MWh of electricity per day from the burning of 7,475 tons of waste. The Tuas South Incineration Plant, the largest incineration facility in the country with 3,000 tonnes per day capacity, produces some 150 MWh of electricity per day of which 80% are being sold in the market. (Note 5)

On the basis that about 73 million tonnes of household and similar waste that remains after waste prevention, reuse and recycling, was treated in Waste-to-Energy Plants across Europe in 2010, 29 billion kWh of electricity and 73 billion kWh of heat can be generated. Then between 7 - 40 million tonnes of fossil fuels (gas, oil, hard coal and lignite) can be substituted annually, emitting 20 - 40 million tonnes of CO₂. (Note 6)

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Proper incentives and priorities should be given to operators and investors for best practices, higher power generation efficiency. Government should always strike a balance on best practices and financial costs when selecting the right operators. Awarding contract based on lowest cost is not the right philosophy.

Conclusion

We must admit the above suggested alternative fuel source are relatively less cost effective as compared to traditional coal fired application or natural gas power generation. However, if government and power companies can work out a proper scheme to define the targets (e.g. a minimum percentage of energy source from the waste sector) then with the right policy and budget allocated for waste facilities, we are confident that our community will be able to develop towards more a circular green economy which is sustainable and more environmental friendly.

As a key stakeholder representing a reasonable size of professionals, companies and individuals in the French related communities, I hope you will find this document relevant and useful when defining the future of Hong Kong. We are taking the long term interests of Hong Kong, the government, the business and the people into consideration when expressing our opinions. We would be delighted to attend any public consultation events as usual as when invited to share our view. Thank you for your attention.

Nicolas Borit President, French Chamber Kin Kan Chan President, Green Business Committee

Summary of Notes:

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- 1. http://www.epa.gov/solidwaste/nonhaz/municipal/wte/index.htm
- 2. http://www.epd.gov.hk/epd/misc/ehk13/en/waste_progressreport.html#numbers
- 3. http://www.powerscorecard.org/tech_detail.cfm?resource_id=5
- 4. http://www.towngas.com/eng/corp/socresp/envprot/cleanprodtion.aspx
- 5. <u>http://www.thejakartapost.com/news/2013/05/22/waste-energy-singapore-s-</u> experience.html
- 6. http://www.cewep.eu/m 1073

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附件

	回應表格 香港的未來發電燃料組合公眾諮詢	
請於20 郵寄地 電子郵 傳真:	014年6月18日或之前透過以下方式提交你的意見。 2址: 香港添馬添美道二號政府總部東翼十五樓環境局電力檢討科 3件: fuel_mix@enb.gov.hk 2147 5834	
第一部	3分(見註)	Number of States
這是	 ☑ 團體回應 (代表個別團體或機構意見) 或 □ 個人回應 (代表個人意見) 	
	<u>117ROPE 110NG 10006 (10)</u> (個人或機構名稱)	_

及 (電郵) (電話)

第二部分 燃料組合

燃料組合		輸入			
		核能 (大亞灣核電站)	從電網購電	天然氣	(及可再生能源)
現開	寺 (2012)	23%		22%	55%**
- Mark	通過從內地電	20%	30%	400/	10%
方案1*	方案1* 網購電以輸入 更多電力	總共:	50%	40%	10%
方案2*	利用更多天然 氯作本地發電	20%	5	60%	20%

*以上的燃料比例用以提供一個基礎作現劃電力供應所需的基連。不同燃料的實際分配應按實際情況釐定。

**包括少量燃油。

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第三部分

具體諮詢問題

問1: 就安全、可靠性、合理價格、環保表現及其他相關的考慮而言,你對兩個燃料組合方案 有何意見? (請就每個方案説明你的看法)

方案	支持	不支持	不支持方案的原因 (可選擇多過一項)
1			□ 安全 □ 可靠性 □ 合理價格 □ 環保表現 □ 其他(請註明):
2	Ø		 ✓ 安全 ✓ 可靠性 □ 合理價格 □ 環保表現 □ 其他(請註明):

問2: 你認為在兩個燃料組合方案中,哪一個較理想?為什麼?(請只選擇一個)

方案1 □ 方案2 ☑

原因:(可選擇多過一項) 安全 ☑

可靠性	V
合理價格	
環保表現	
其他	

第四部分

其他意見或建議

價錢相福 能助丧本地放草率。

請註明:

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|| Dutch Chamber of Commerce in Hong Kong 音 港 荷 蘭 商 音

Mr. KS Wong, JP, Secretary for Environment Environment Bureau, Electricity Reviews Division 15/F, East Wing, Central Government Offices 2 Tim Mei Avenue, Tamar, Hong Kong



16 June, 2014

Re: Public Consultation on Future Fuel Mix for Electricity Generation

Dear Mr. Wong,

The Dutch Chamber of Commerce is grateful to have the opportunity to respond to the Government's Fuel Mix consultation paper.

We would like to outline our views on the fuel mix for Hong Kong's future electricity supply as follows.

Having taken all arguments into consideration, we would like to give our support to option 2 with the following remarks. With option 2, the fuel mix is transparent and so is the positive impact on the air quality and emissions in Hong Kong. In addition, expected higher electricity prices -when comparing both options- will create an incentive to reduce the amount of electricity we use in Hong Kong. This is especially the case since current electricity prices are relatively low.

Furthermore, we feel the consultation paper should include ambitious renewable energy targets in order to reduce emissions, enhance recycling and contribute to the waste management solutions. Looking at the Hong Kong circumstances, we would like to suggest three possible options for enhancing renewable energy.

 Co-firing of biomass in existing power plants as a source of renewable energy for the production of electricity, is a proven method, also in Asia. Recycling of construction wood, is at present taking place in HK on a moderate scale. The end product, wood pellets, are exported to South Korea, resulting in quite a carbon footprint. Using them in HK power plants and setting ambitious targets, could boost the recycling industry in that segment.



- Wind energy. It is known to us, that HK power plants have looked into the possibility of erecting a wind energy park in HK waters. However this has so far not been pursued. Setting a specific target could encourage these companies to look into the matter again.
- Waste to energy. Many countries, including the Netherlands, as you know, have a track record of producing power (electricity) out of their waste. In conjunction with your plans to overhaul the waste management policies in HK and building a moving grate incinerator, the surplus of generated energy could be put to use through one of the power plants.

To encourage these initiatives, it would, in our humble opinion, be meaningful to have separate targets for coal and renewable energy. This will also provide an incentive for electricity producers to reduce emissions.

When looking at option 1, the fuel mix of the additional electricity to be imported via the Southern China Power grids is not transparent. Therefore we have to assume that it will be from coal fired power plants, as these are the main source of energy today in China. This means that the actual CO2 emissions will in South China are not likely to improve much. Furthermore, as stated in the consultation document, electricity companies in Hong Kong have invested between 2009 and 2011 HK\$ 10 billion to significantly reduce SO2 and NOx emissions to meet the more strict norms in Hong Kong. We have no clear insight if electricity companies in the Mainland have to adhere to the same strict emission norms, hence our further support for option 2.

g Kong

Yours sincerely,

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Daniël de Blocq van Scheltinga Chairman Dutch Chamber of Commerce in Hong Kong

CC:

Ms. Christine Loh Kung-wai, JP Under Secretary for the Environment

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Business and Professionals Federation of Hong Kong 香港工商專業聯會

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BPF Response to Public Consultation on Future Fuel Mix for Electricity Generation

This Consultation Document has rightly opened an important debate on the source and nature of the future supply of fuel for Hong Kong's electricity generation. The decisions on this will have critical and very substantial long-term economic and political implications and involve other fundamental considerations beyond the single issue of fuel mix. They must not be taken lightly or for inadequate reasons.

Whilst, therefore, we are not opposed in principle to further diversification of fuel supply, including fuel import, we do not believe it is appropriate to express any preference for either of the two options proposed based on fuel mix alone. We submit that more detailed information particularly in relation to such issues as cost effectiveness, reliability, connectivity and the implications for the Schemes of Control is needed for any balanced public discussion.

Reliability and Stability

This is the most important issue. It is not just about power supply but also includes the maintenance of a world class service and our capacity to be master in our own house. Maintaining infrastructure, software, manpower and skills is crucial. These are the backbone of our own enviable domestic record of power reliability over many years and of the opportunity to export knowhow as in the development of Daya Bay.

The Consultation gives illustrations of electricity import in other jurisdictions. Given the difference in scale and composition of economy, we do not consider Macau to be a relevant example for comparison and would emphasise that Hong Kong compares most favourably with both Europe and North America both in terms of supply reliability and of quality of service. The problems of over reliance on imported fuel, particularly of supplies which cross a number of national or regional borders are well documented. Potential supply from the Mainland is not immune to this issue.

It is a matter of fact that, notwithstanding community concerns on monopolies, the current structure and the Schemes of Control have for a long time served Hong Kong extremely well in providing reliable and in more recent years increasingly cleaner power that is competitively priced by international standards. Any attempt to open the market further or materially change the structure must give full consideration to both the potential downsides and benefits.

Flexibility

For us to achieve a better future fuel mix which is within our control, we should aim to adopt a flexible approach which enables us to monitor the nature of power we import over the longer term. Commitment to a fixed level of imported fuel mix either in absolute or percentage terms would militate against this.

Despite major advances in power supply on the Mainland, there remain many concerns over competing priorities and when there will be a sustained surplus (Hong Kong has long benefited from its built in and planned surplus capacity). Whilst the move from an industry to a serviced based economy may be positive, growth in demand from increasing affluence must also be considered. New technologies and projected improvement in the relative cost of cleaner renewable energies are also factors which should influence decision making on the scale and timing of any major new import of power. These are among issues on which we lack sufficient information to make an informed judgment.

Connectivity

A long recognised and potential major weakness in our current system of power supply is the lack of connectivity between the two power companies. There is no genuine or integrated solution either to fuel mix or reliability if imported fuel is only connected to the existing CLP power connection to the Mainland. We suspect that if that is the limit of our ambitions, it would be best and most economically served by revisiting the earlier but politically sensitive proposal to expand Daya Bay and increase the level of our existing linkage with its capability to decouple from the Mainland grid.

Major factors in deciding the scale of additional power importation from new sources must therefore be the estimated cost and practicality, especially land availability, of installation of new transmission facilities including connectivity. Information is also lacking on these issues and the Consultation Paper does not address the connectivity issue.

Separation of Power Generation and Transmission

This is a long debated issue a decision either way on which must impact the planning of the scale, timing and nature of any new sources of fuel import.

Conclusion

The option to import a higher proportion of our electricity merits consideration to diversify sources, to ensure cleaner energy, to give more flexibility of choice and to provide leverage to Government in renegotiating the Schemes of Control. Better fuel mix and fuel mix flexibility are important, but not the only or the main determinant. Reliability and maintaining local capacity and capabilities are prime considerations.

The choice as presented in this Consultation Paper over simplifies the planning considerations which should govern future Government policy in coordinating our domestic power generation and supply with that on the Mainland.

16 June 2014

Planning Ahead for a Better Fuel Mix

HKGCC Submission in response to the Public Consultation on Future Fuel Mix for Electricity Generation

- 1. The Hong Kong General Chamber of Commerce ("HKGCC") has all the time been a supporter of the energy policy objective of the HKSAR Government to "ensure reliable supplies of energy at reasonable prices, promote its efficient and safe use, and at the same time minimize the environmental impacts in the production and use of energy". Accordingly, the HKGCC fully supports stringent emission requirements for power plants, subject to the condition that Hong Kong needs a clear and effective energy policy to ensure that the territory continues to be supplied with the energy that we need with full regard to reliability, quality, social values and affordability, now and for the long term.
- 2. The HKGCC welcomes the Environment Bureau's public consultation to seek views on how the fuel mix for electricity generation could be changed to better serve our population and economy in future, having regard to the need to strike a balance among the four competing policy objectives of energy safety, reliability, affordability and environmental performance. As the consultation document points out, we cannot compromise on safety, and there is no room for lower reliability, given a safe and reliable power supply is a pre-requisite for maintaining Hong Kong's competitiveness and the ability to go about our daily life.
- 3. In the consultation, the Environment Bureau has described two fuel mix options [1] importing more electricity through purchases from the Mainland power grid, and [2] using more natural gas for local generation, in easily understood language for public discussion. It is noteworthy that the idea of large-scale grid purchase from the Mainland in addition to nuclear power is brought up for the first time. Nonetheless, while it is generally agreed that any reduction in coal-fired power supply is the right direction in principle for Hong Kong, the consultation document falls short of providing sufficient information to evaluate the two fuel mix options from this perspective. Another concern is regarding the limited choices of fuel mix for the public to select. Our comments on the consultation are detailed as follows.

Energy Demand and Infrastructure

4. In deciding the fuel mix, whether through importing more electricity from the Mainland or continuing to rely significantly on local generation, it is obvious that we should address the future electricity demand first before evaluating possible options. According to the consultation document, electricity consumption from 2008 to 2012 increased by about 5.1%, or by an annual average of about 1.3%, despite the 19.3% GDP growth recorded in the same period (para. 1.5). In 2012, Hong Kong consumed 43 billion kWh of electricity. At an annual average growth rate of 1%-2%, it is predicted to reach

a total electricity consumption of 50 billion kWh in 2023 (para. 4.3). The estimation, however, does not seem to be taken account of substantial recent efforts to achieving energy efficiency and conservation by the business sector.

- 5. Buildings account for about 90% of the total electricity consumed in Hong Kong, and we have great potential to improve energy efficiency and reduce our energy consumption in this area as a whole. The Buildings Energy Efficiency Ordinance, for example, has come into full operation since September 2012 to enhance energy efficiency, and there are ongoing private efforts working towards this direction. The Hong Kong Green Building Council has initiated a campaign to reduce 30% energy consumption of buildings by 2030, and many major property owners have also been promoting energy efficiency to stay competitive in the market. The moderate rise of electricity demand induced by economic growth will therefore likely be offset, or more than offset, by continued business efforts in the coming years.
- 6. Despite the uncertainties on electricity demand, it is generally believed that natural gas is going to be a major transition fuel at least for the next few decades in view of the ongoing replacement of coal-fired generators to meet the Government's emission caps. Therefore, the proportion of natural gas within the fuel mix is expected to rise regardless of the outcome of the consultation, which may imply that more capacity for power generation using natural gas would be added no matter what. In that case, it doesn't seem to be justified to build a large scale cross-border interconnection network immediately, if we are able to achieve self-reliance in electricity generation.
- 7. As to the need for making the long term fuel mix decision now, one may argue that energy infrastructure development takes time, i.e. about four to five years to build new gas-fired electricity generating units, and about eight to ten years to put in place new cross-boundary transmission infrastructure (para. 4.2). The current Scheme of Control Agreements ("SCAs") will expire in 2018, and it may be a good timing to come up with a decision within the next few years, so as to prepare for the infrastructure development in order to implement a new fuel mix by 2023. However, large-scale grid purchase is untested in Hong Kong (para. 4.10), and an informed and foresighted decision depends a lot on discussions among stakeholders and the Legislative Council supported by accurate and available data, as well as negotiations with fuel suppliers to secure long-term supply contracts. While we encourage the HKSAR Government to conduct feasibility studies (para. 4.20) and risk assessment on detailed technical issues of grid purchase, in view of the mushrooming number of complicated issues associated with the growing social and economic integration with the Mainland and possibly power interconnection in the long run, we doubt if the community could reach a consensus on capital investment in new cross-boundary transmission infrastructure by 2018. In particular, just in case future electricity demand

grows slower than the current projection, the decision made today may lead to excessive capacity built-up which cannot be reverted.

Electricity Market and Regulatory Framework

- 8. We understand that the HKSAR Government was committed to introducing competition to the electricity market in as early as 2018 if the requisite market conditions are present, as stated in its submission on "New Scheme of Control Agreements" to the Legislative Council on 7 January, 2008. According to the consultation document, the grid purchase option will enhance interconnection between the two local power grids, and hence provide more room to introduce competition at the generation level (para 4.40). However, the opening up of the electricity market is an important long-term policy requiring detailed studies and comprehensive economic assessments to define "requisite market conditions" and ascertain market readiness. Accordingly, the Government should not put the cart before the horse by considering market opening up as one of the key objectives in choosing the fuel mix in this consultation.
- As to the issue of viability for new energy operators to develop new grids 9. with substantial investments in a small territory, it is noted that many advanced economies have been spending efforts to privatize state-owned electricity assets and finding appropriate regulatory regimes to manage post-privatization. Hong Kong's electricity sector, on the other hand, has been privately owned from the outset, and the consensual SCAs have stood for decades, delivering a stable regulatory environment that encourages necessary investment while having the flexibility to balance public concerns on tariffs and environmental protection. In contrast, the Mainland's electricity market is dominated by state-owned enterprises without noticeable progress towards liberalization. Importing power from the Mainland might be perceived as a significant step-back from our current market-based liberalized economy. Further, grid purchase involves major infrastructural changes, which differs from importing necessaries (such as foods and other products) driven by market demand. A certain percentage of importing power in the fuel mix mandated by the Government might also imply an intervention in the free market economy.
- 10. One may consider that grid purchase from the Mainland offers the advantage of national security under "One-Country", with reference to the recent energy crisis of Ukraine. Nevertheless, the complexity of a cross-border regulatory framework should not be underestimated. Effectively, China Southern Power Grid ("CSG") would become a sole energy seller outside Hong Kong, but the consultation document lacks concrete measures to deal with jurisdictional issues such as price negotiation and dispute settlement. A decision to compel imports of more power from the Mainland might be a regulatory decision, subject to a thorough and comprehensive regulatory impact assessment.

Energy Reliability and Stability

- 11. Although electricity imports and exports have been practiced in many other places, including North America, the European Union, and the Macao SAR which imports about 90% of its electricity from the Mainland power grid, these may not be good comparables for Hong Kong a "vertical city" with a significant concentration of high-rise domestic and commercial buildings served by lifts and escalators, and a densely populated environment mobilized by mass railway networks. We have to keep in mind that a reliable energy supply is essential not only to support and drive economic activities and development, but also to ensure safety of the general public. The great blackout incidents in North America and Europe in 2003 have demonstrated the uncertainties and potential risks of large-scale interconnected grid due to the complexity of infrastructure in nature. Accordingly, to prevent the consequence of power failure, Hong Kong property owners may be required to install back-up generators in buildings, involving substantial investment in facilities, if the reliability of our energy source is in doubt.
- 12. As the consultation paper itself notes, Hong Kong enjoys a highly reliable electricity supply rate of exceeding 99.999%, which surpasses many other major metropolitan cities in the world including those in the Mainland. Being an international financial and commercial centre, Hong Kong cannot afford energy instability. A temporary blackout or power instability, even if it is just for a few seconds, will result in severe interruption, tremendous loss and damage in stock and financial markets, data centres and telecommunications services, airport and transport operations, productions and other business activities heavily relying on electricity supply. Businesses need reassurance of having the same or higher level of energy reliability that they are enjoying, which has not been guaranteed by the "untested" grid purchase scenario. Apparently, energy reliability in the Mainland cities does not compare favourably with Hong Kong.
- 13. To maintain energy reliability, Hong Kong would probably need to import more than enough electricity from the Mainland grid, but the leftover cannot be stocked up economically due to the huge energy storage system required. We are unsure if favourable terms could be agreed on the flexibility of daily electricity supply to tie in with seasonal fluctuation of energy consumption, and whether Hong Kong is given the priority to be transmitted with grid electricity in the event of energy shortage and blackout in the Mainland.

14. Further, the consultation document proclaims that reliability of grid purchase is "high with suitable local back-up" (para. 3.18). It may be the case of Macau, in which the gaming industry is equipped with back-up generators. In the events of inordinate stress such as blackout, Hong Kong may cease to have the ability to generate power due to reduced local capacity. In order to maintain electricity stability in Hong Kong, the two power companies are required to maintain sufficient back-up electricity generating capacity. It brings up two technical questions, i.e. **the desirable level of local back-up capacity to supplement the proposed 30% of total energy supply by grid purchase, and the lead time to convert fuel sources into electricity to cater for emergencies**, which are not addressed in this consultation.

Affordability and Environmental Performance

- 15. Both options tabled by the Government have cost implications. Regardless of the decision, our electricity tariff will likely increase due to the wider use of cleaner but more expensive fuel. The Government estimates that the unit import/generation costs under both options will roughly double the current unit generation cost (para. 4.29). In our views, importing power from the Mainland does not necessarily guarantee lower rates as CSG faces the same issues of increasing fuel costs. Nonetheless, the consultation document does not provide detailed calculation of the tariff changes, based on Macau's experience and the trend of gas prices, which does not facilitate an intelligent debate of the alternatives on offer.
- 16. To secure sufficient quantities of energy fuel at right prices, it is essential to acquire diversified sources of energy supply with flexibility to maintain bargaining power, and minimize risk from power failure. There are concerns on Hong Kong becoming a captive buyer if the grid purchase option is chosen, given the examples of negotiations of Hong Kong's water supply from Dongjiang and Macau's electricity supply from the Mainland. In the case of the natural gas option, the challenge of price fluctuation is subject to both regional and international supply and demand, as well as technological and regulatory developments. Storage facilities, such as liquefied natural gas terminals and floating storage regasification units could open up new opportunities of bringing in competitive gas choices for Hong Kong.
- 17. According to the Census & Statistics Department, Hong Kong households on average spend less than 2% of their expenditure on electricity supply (para. 1.12), and the electricity tariffs in Hong Kong are currently lower than Singapore, London, New York and Sydney (para. 1.13). It would be instructive to know how the new tariffs under the two options rank comparing to similar economies under the objective of building community support towards a cleaner fuel mix, assuming that it is justified.

- 18. In terms of environmental performance, we are told that both options can meet the 2020 environmental targets for better air quality and carbon emission performance. Grid purchase may facilitate access to more diversified and greener fuels which are not available in Hong Kong (para. 4.35), but we are uncertain about the fuel mix of Mainland grid given limited control over the use of cleaner fuel across the border. As pollution knows no border, we have to make sure that it would not be a waste of efforts to reduce local emissions by transferring the pollution to our backyard.
- 19. One way to assess the environmental performance of grid purchase is to make reference to Macau's indirect emissions from electricity imports. If, however, such data as carbon intensity of grid purchase is not available, companies may not be able to truly report on their own carbon emissions, as is the case in some countries like Australia. With the upcoming intention of the Hong Kong Exchanges and Clearing Limited to elevate parts of its current voluntary reporting guidelines from "recommended practice" to "comply or explain" level, there is a possibility that listed companies would need this information to meet the requirements.

Other Options

- 20. The consultation document proposes two fuel mix options only, but there may be other unaddressed alternatives. Importing more nuclear power, for example, has not been considered due to the safety concern after the Fukushima incident. Nevertheless, the reality is that a nuclear power plant in Daya Bay has long been, and will continue to be, in operation with or without energy transmission to Hong Kong. Having said that, the wider community in Hong Kong will need reassurance in relation to the risks associated with nuclear power.
- 21. The HKSAR Government has been encouraging the development and wider adoption of renewable energy in Hong Kong with regard to technical and economic viability. The primary difficulty encountered under this option is natural geographic constraints of Hong Kong, and renewable energy remains a relatively expensive power generation alternative because of the hefty initial investment in infrastructure. While encouraging power companies to make greater use of renewable resources, we support the Government's incentives to businesses and buildings to install small-scale renewable facilities where feasible.
- 22. The decision on the future fuel mix should be a very long-term policy goal, but the planning horizon in the consultation document ends only in a decade from now (para. 4.2). The analysis and assessments would be more complete and holistic with a much longer time frame, when other options, including nuclear power and renewable energy, could become more viable.

Conclusion

23. The HKGCC supports a clear and effective energy policy to ensure a high level of energy reliability and stability, with full regard to affordability and environmental performance. On a subject of such a magnitude of importance affecting the livelihood of everybody in Hong Kong, the Government should provide sufficient data to facilitate public debate so as to come up with an informed decision. The option of grid purchase from the Mainland would be subject to the results of feasibility studies and risk assessment to prepare for the possible energy integration in the long run. In the absence of more detailed information, we believe that local generation remains the more viable option for the near to medium term.

HKGCC Secretariat 17 June, 2014

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Annex

Response Form Public Consultation on Future Fuel Mix for Electricity Generation for Hong Kong

Please	send this response form to us on or before 18 June 2014 by one of these means:
mail:	Environment Bureau, Electricity Reviews Division, 15/F, East Wing,
	Central Government Offices, 2 Tim Mei Avenue, Tamar, Hong Kong
e-mail;	fuel_mix@enb.gov.hk
fax:	2147 5834

Part 1 (See Notes)

This is a

corporate response (representing the views of a group or an organisation) or 1 individual response (representing the views of an individual)

by The Lion Rock

Institute (name of person or organisation)

and P (telephone)

(e-mail)

Part 2

Fuel Mix Options

at

FUEL MIX Existing (2012)		IMP	ORT		COAL (& RE)	
		NUCLEAR (DBNPS)	GRID	GAS		
		23%		22%		
OPTION 1-	Importing more electricity	20%	30%	A laborhour	init	
at ment	the Mainfilled power grid	Total . 60%		40%	10%	
OPTION 2	Using more natural ges for local generation	20%		50%	\$0%	

The above fuel mix ratios arm at providing a basis for planning the necessary infrastructure for electricity supply. Flexibility should apply to actual deployment of each fuel type, having regard to the circumstances happening on the ground.

inclusive of a small percursion of oil

Part 3

Specific Questions for Consultation

Q1: How do you view each of the two fuel mix options with regard to safety, reliability, cost, environmental performance and other relevant considerations? (Please indicate your view on **EACH** of the two options.)

	Option	Support	Not Support	Reason for NOT supporting (You can tick more than one box)	
	1		Ń	Safety Reliability Affordability Environmental performance Others (please specify): Please see the comments in Part 4	
	2		V	□ Safety □ Reliability □ Affordability □ Environmental performance ✓ Others (please specify):	
Q2:	Which of the tw Option 1 Option 2	vo fuel mix o	ptions do you pro	efer? Why? (Please tick ONLY ONE box)	
	Reasons: (You Safety Reliability Affordability Environmenta Others	a can tick mo	re than one box I	se specify: <u>Please see the comments in Part</u>	a non a n

Part 4

Other Comments and Suggestions

Please see the attached 2 pages for comments and suggestions.

向大陸購電激化中港矛盾

香港最近討論未來 10 年發電燃料組合,有兩個方案,A是向南方電網購 電,B是大幅提高本地天然氣發電比例至六成。A 餐和B 餐以外,我知一 定有C 餐存在。不過在C 餐未出現以前,可以研究對比一下A 和B 餐。 如果現在已經可以宣判其中一個是不行的,便能夠省下以後麻煩。

以中央和特區政府高度重視社會和諧,極不希望中港矛盾惡化下去。當內 地已經受電荒經常停電的困擾,還要保證輸港電力有99.9999%的可靠率, 只會令大陸同胞更鄙視港人,認為香港人沒有阿爺奶水不行;如果不能保 證電源可靠,則香港人又會埋怨政府用納稅人的錢引入劣質電力(而且以 現時資料,價錢一點也不便宜),隨時令地方政府和特區政府矛盾升溫。A 餐明顯令香港人、大陸人、兩地政府都不爽,實在是餿主意。

作為獅子山學會行政總監,我贊成中港加強貿易,不過由政府牽頭的交易, 而不是由民間自發,我卻非常有保留,因為現時的中港矛盾,都是回歸以 來特區政府常常把「中央幫香港」掛在口變,而沒有強調香港絕對能夠「搞 掂自己」所致。

「搞掂自己」,絕對不是抗拒中央。我聽說,中央領導人的對港政策,是 「你有問題最好自己解決不要煩我」。中央面對國內的維穩問題,疆獨藏 獨分離分子、中日關係、中美博弈、又要搞經濟創造就業、打貪打大老虎, 件件事都可以令領導人焦頭爛額,香港作為中國最富裕的城市,事務應是 最沒迫切性的,不是中央不重視香港的特殊地位,而是香港應該是最能幹 的兒子,應能管好自己,最好有餘力為阿爺分憂,例如阿爺改裝烏克蘭的 航母都是靠港商入口一類。

港應站起來自己搞掂

所以當年沙士,當內地都口罩短缺,香港政府竟然跪求中央供應口罩,實 在令阿爺失望,從此給人口實,遭人說「沒有大陸香港早就完蛋了」,又 有什麼話好說?

從此,就算我們真金白銀拿錢出來買的,例如東江水,還是天價的買(2002 年數據顯示,我們購水的價錢是馬來西亞供水給新加坡的260 倍);自由 行明明是中港人民都有利,大陸人來港旅遊購安全奶粉,香港人不用做嗎? 正常交易,都被人視為「救港」,給其他省政府和人民抽水佔便宜,這口 氣香港人又怎嚥下?怎難怪有中港矛盾? 最近有一件少事,更反映中港矛盾之激化,不但只拿龍獅旗衝入軍營的港 人偏激,大陸人也不理性。中移動香港有月費 68 元 3G 無限流動數據(當 然是慢速)連通話計劃,內地網民對比起自家中移動(0941) 58 元人民 幣只包括 10MB 的數據,當然不是味兒。稍有財經知識的,都知道這樣大 的差別源於大陸電訊市場為國家維穩工具,不可能像香港容許激烈競爭所 致。不過網民不都是有財經常識,有些揶揄中央問誰才是親生兒,有些則 說中移動拿大陸人的錢補貼香港人。自己市場封閉導致電話通話費貴,都 可以視為大陸對香港補貼,如果我們在大陸的電荒的情況下購電,大陸同 胞會怎樣看我們?香港人被迫吃死貓,中港矛盾怎不愈來愈失控?

因此,在和諧社會的前提下,A 餐是萬萬不可行。我重申,這不是拒絕中 港貿易,和大陸分離,而是香港應該站起來,能自己搞掂都自己搞,免得 給其他政府口實,造成地方矛盾。這樣就不會令阿爺尷尬,不會為阿爺添 煩添亂,做回一個叻仔,為阿爺分憂,這樣大家都開心,不是嗎?

獅子山學會行政總監 王弼

617B00025

附件 回應表格 香港的未來發電燃料組合公眾諮詢 請於2014年6月18日或之前透過以下方式提交你的意見。 郵寄地址: 香港添馬添美道二號政府總部東翼十五樓環境局電力檢討科 電子郵件: fuel_mix@enb.gov.hk 傳真: 2147 5834 第一部分(見註) ☑ 團體回應 (代表個別團體或機構意見) 或 這是 □ 個人回應 (代表個人意見) 夏春社 (個人或機構名稱) 及 (電話) (電郵) 第二部分 燃料組合

燃料組合		輸」	l		被	
		核能 (大亞灣核電站)	從電網購電	天然氣	(及可再生能源)	
	現時	(2012)	23%	-	22%	55%**
No. of Street,	方室1*	通過從內地電	20%	30%	40%	10%
73		更多電力	總共:	共:50%		1076
	方案2*	利用更多天然 氣作本地發電	20%	• • • • • • • •	60%	20%

*以上的燃料比例用以提供-一個基礎作規劃電力供應所需的基建。不同燃料的實際分配應按實際情況釐定。

**包括少量燃油。

617 B00025

第三部分

具體諮詢問題

問1: 就安全、可靠性、合理價格、環保表現及其他相關的考慮而言,你對兩個燃料組合方案 有何意見? (請就**每個**方案説明你的看法)

	方案	支持	不支持	不支持方案的原因 (可選擇多過一項)		
	1			□ 安全 □ 可靠性 □ 合理價格 ☑ 環保表現 ☑ 其他 (請註明): <u>注水</u> 送 ○ P(1(4)。		
19	2		Ū⁄	□ 安全 □ 可靠性 □ 合理價格 ☑ 環保表現 ☑ 其他 (請註明): <u>济 冬 (約)(</u> 54年。		
問2: 亻 ;	問2: 你認為在兩個燃料組合方案中,哪一個較理想?為什麼?(請只選擇一個) 方案1 □ 方案2 □					
]	原因: (可選擇 安全 [可靠性 [合理價格 [環保表現 [其他 [多過一項)]]]] 請註明	:			
第四部分 其他意見或建議						
-	房間的	144 .				



<u>《未來發電燃料組合諮詢文件》</u> 長春社回應

環境局早前發表《未來發電燃料組合諮詢文件》(下稱諮詢文件)並進行公眾諮詢,當 中提出兩個方案,即「方案一:通過從內地電網購電以輸入更多電力」和「方案二: 利用更多天然氣作本地發電」諮詢公眾。

長春社認為發電過程對現今脆弱的環境做成莫大的影響,因此社會在討論未來發電燃料組合時,更應從環保角度考量最理想的方案,不應只局限在這兩個方案中作比較和 選擇。就香港未來發電燃料組合,我們有以下意見:

1. 應全面規劃策略性的綜合能源政策

香港目前主要倚賴火力發電,現在的燃料組合中,以煤、天然氣和向大亞灣核電廠購入的核電為主。目前的燃料組合在控制空氣污染和減少碳排放兩方面,均非理想的模式。長春社作為環保團體,非常關注未來發電組合的環保表現,例如再生能源的應用比例;另一方面,我們亦希望政府能加大力度,提升香港整體能源效益,以免將來的 能源需求大幅增長。

2. 應推廣節能,提升本地能源效益

在 2008 年至 2012 年間,香港的用電量增長約 5.1%,平均每年增長約 1.3%。長春社認 為,無論採納怎樣的能源組合,政府都必須加大力度推廣節能,提升本地能源效益。 我們促請政府應先訂立出更具體的節能方案,透過不同策略如修改建築物條例,規定 新建大廈必須具備節能設計、訂立切實可行的節能目標(此目標不應低於過去五年的 平均年度用電量增長)等,以更精準地評估未來的電力需求,並調整未來發電量/購 電量。

3. 應提高可再生能源在新燃料組合的比例

可再生能源是目前最清潔的能源,兼且有助減少碳排放量,惟在諮詢文件中,卻指可 再生能源供應有限,並預計在2023年燃料組合中,可再生能源只佔燃料組合約1%。 諮詢文件對可再生能源的消極取態令人失望。政府過去對香港發展可再生能源的潛力 的估算,建基於機電工程署在2000年所進行的研究,惟國際上可再生能源在過去十多 年有急速發展,政府應重新考量提高可再生能源在新燃料組合的比例。政府應在新界 鄉郊、新發展區內使用再生能源設施、改善將再生能源接駁至電網的機制,包括訂立 規則、入網費、電力公司如否決入網申請後的上訴機制等,以鼓勵可再生能源(包括堆 填區沼氣、政府計劃中的各項轉廢爲能的項目)入網,提高可再生能源的使用量。

4. 增加天然氣發電量應視作短期安排

在不同的發電燃料種類中,煤所排放的污染物最多。在諮詢文件中推薦的兩個方案當中,火電仍佔上一定燃料比例,即使南網的發電燃料組合當中,亦有62%是火電。諮詢文件中第2.5段提到大部分的燃煤發電機組將於2017年退役,部分可能稍爲延長壽命。長春社建議政府應敦促兩電加大本地天然氣發電量,逐步全面取代燃煤發電,惟 天然氣亦是化石燃料之一,故短期增加天然氣發電的同時,大幅減低能源強度及整體 能源需求量、廣泛應用可再生能源等長遠目標亦不能放棄。

5. 應逐步減少至全面停止使用核電

至於核電方面,我們同意限制核電的比例,並應逐步減少使用核電。當大亞灣核電廠 在未來十年至十五年退役時,本港應全面停止使用核電。政府亦應在未來十年間,透 過節能及提升能源效益,減輕停用核電所產生的影響。

6. 南網的水力發電問題

諮詢文件第4.16段中提及,2012年南網的總裝機容量有44%是非化石燃料,當中大部份是由雲南輸出的水電。水電雖曾一度被視為可再生能源的選項,惟興建大型水壩的模式,對原有河川生態和地方人文景貌的破壞,值得令人慎思發展水力發電所引發的社會、環境和人文道德問題。另外,珠三角地區的空氣污染情況已頗爲嚴重,即使文件中4.17段強調環境局預計污染物的「置換效應」將很輕微,但作為負責任的地區,我們實不欲容讓境外地區的環境因為香港的需要而進一步變差。

7. 即使向南網買電,應先要求南網提升同等的再生能源產電量

若果如諮詢文件建議般,香港從南網輸入的電量,雖然只佔其 2012 年發電量的不足 2%,但為使香港能用上更清潔的能源而又能確保污染物「置換效應」不會因向香港輸 電而發生,長春社希望政府能在購電之先要求南網提升同等的再生能源產電量,例如 風力發電等。此做法或許會令電價提升,惟本社認為這是香港市民應該共同承擔的環 境責任。政府亦應考慮在 2018 年和兩間電力公司商討兩電准許利潤時,以十年期的美 債利息作參考,調整持續高企的回報比例,讓兩電也發揮企業社會責任,共同承擔保 護環境的責任。

8. 「廠」「網」分家以提升競爭力

長久以來,本地的電力市場均欠缺競爭力。如要提升電力市場的競爭力,並達至以上 所提及的把住戶所產生的可再生能源注入電網,長春社建議政府積極計劃把香港的電 力市場作「廠」「網」分家。政府可以合理價格回購電網擁有權、為市場就空氣質素 及碳排放訂立發電的排放標準,然後讓合資格的電力公司進入香港電力市場,為香港 市民提供合乎環保標準及價格合理的供電服務。加入了選擇後,消費者可以透過選擇 不同的電力公司,全力推動電力公司不同範疇上的改善工作。政府可以就開放電網一 事與兩電力公司商討或由政府建立相關的電網作全港輸電之用。 最後,未來電力市場的監管和問責等問題,也是重要的考慮因素。即使宏圖願意多麼 美麗,若日後監管無力,只會與最初的期望造成落差。在制定未來發電燃料組合的方 案時,亦應考慮利潤管制計劃或跨境供電協議的監管和問責問題。

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Annex

Response Form

Public Consultation on Future Fuel Mix for Electricity Generation for Hong Kong

-	and this response form to us on or before 18 June 2014 by one of these means:
Please s	English Reviews Division 15/F. East Wing.
mail:	Environment Bureau, Electricity Reviews Division, ferry Lange Kang
	Central Government Offices, 2 Tim Mel Avenue, Tamai, Hong Kong
e-mail:	fuel_mix@enb.gov.hk
fax:	2147 5834

Part 1 (See Notes)

 \checkmark

by

This is a

corporate response (representing the views of a group or an organisation) or individual response (representing the views of an individual)

Mobile Streams Limited

(name of person or organisation)

Part 2

Fuel Mix Options

	and the second second	IMPORT		NATURAL	COAL (& RE)
FUEL MIX		NUCLEAR (DBNPS)	GRID	GAS	
	Existing (2012)	23%		22%	55%
Contraction (1)	Importing more electricity	20%	30%	40%	10%
OPTION 1"	through purchase from the Mainland power grid	Fotal : 50%		400 70	40
OPTION 2*	Using more natural gas for local generation	20%	-ADDING to	60%	20%

 The above fuel mix ratios aim at providing a basis for planning the necessary intrastructure for electricity supply. Elexibility should apply to actual deployment of each fuel type, having regard to the circumstances happening on the ground.

11 Inclusive of a small percentage of oil

617Babba Bi

Part 3

Specific Questions for Consultation

O1: How do you view each of the two fuel mix options with regard to safety, reliability, cost, environmental performance and other relevant considerations? (Please indicate your view on EACH of the two options.)

Opt	ion	Support	Not Support		Reason for NOT supporting (You can tick more than one box)
1					Safety Reliability Affordability Environmental performance Others (please specify):
2	min				Safety Reliability Affordability Environmental performance Others (please specify):
Which of Option 1	the two) fuel mix of	otions do you pre	fer? W	hy? (Please tick ONLY ONE box)
option			(¥)		
Reasons Safety Reliabilit	r (You c	an tick mon	e than one box b	elow)	
Affordat	oility		\checkmark		
	0.00	A	0		
Environr Others	nental l	Performant	Pleas	e spec	in the second seco

Other Comments and Suggestions

Power from China lacks transparency. It's doubtful whether they actually comply with the standard given the track record of their operation and the existing level of air pollution in the southern part of China. One obvious reason is that they are buying coal from Indonesia instead of Australia. See

http://accountboyhk.mysinablog.com/index.php?op=ViewArticle&articleId=4384164

Institution of Electrical and Electronic Engineering, Hong Kong

Views in response to the Public Consultation on Future fuel Mix for Electricity Generation

1) Energy Policy Objectives	Government's policy objective is to ensure that consumers receive reliable, safe and efficient electricity supply at reasonable prices while minimizing environmental impact caused by the generation and use of electricity.
Our views	 1.1 The proposed statement looks reasonable, but it is more desirable to have more precise descriptions in the statement for avoidance of ambiguity and different interpretations made by different stakeholders in the electricity supply industry 1.2 We consider the proposed Energy Policy Objectives statement
	need further interpretation, opportunities, extensions and
	implementation mechanism as described as follows:
	• to take wider territorial perceptive to beyond Hong Kong territory;
	• to have more precise qualitative descriptions on reliability, safety, efficiency and price reasonability e.g. not less than that in metropolis of developed countries;
	• to include other objectives such as fuel supply diversity, advances in power technology;
	 quantitative and qualitative environmental targets; and Implementation mechanism to achieve such Energy Policy Objectives.
	1.3 For the reason that Hong Kong's reality as a small place in Asia without energy resources of any kind, we need to make full of use of worldwide market forces and appropriate mechanisms to ensure satisfactory compliance with our energy policy in practices

2) Future fuel mix for electricity generation	As strategic means to achieve the energy policy objectives
Our Views	2.1 We agree that Fuel Mix is a primary means to achieve our energy policy objectives, but should not be the only means. Over- reliant on a particular fuel type or mix, or one supply source does not make sense. Strategically, with Energy Policy Objectives specified in fine and more detailed forms, we could identify as many alternatives as allowable by technology and worldwide commercial conditions without either restricting ourselves at the

very beginning to a very few alternatives only or limiting our exit
possibility to better alternatives that may arise from time to time.
We should review and compare commercially, economically, and
technically all alternatives for both short term and long term
scenario for final selection of most cost-effective one in line with
Energy Policy Objectives and in the best interest of Hong Kong
community.
2.2 As one of the very few global financial centers, Hong Kong needs a more proactive regulatory framework including an independent regulatory body and authorized mechanisms as other developed countries. The future regulatory frameworks should therefore have provisions and flexibilities enforcing stakeholders in the electricity supply industry in implementation of any strategic actions leading to compliance of Energy Policy Objectives.
2.3 The public should, in addition to being informed of likely changes and sought consultation as required from time to time, play a more active part, such as public hearing, in the decision of strategic actions.

3) Post-2018	Outcome of the proposed future fuel mix for electricity generation
regulatory	helps to set the scene for the review of the post-2018 regulatory
framework for the	framework for the electricity market
electricity market	
Our Views	 3.1 In accordance with prevailing SOC agreement, HKSAR government spells out explicitly that changes may be introduced to the post-2018 electricity supply regulatory framework after consideration of the market readiness and other relevant factors. We believe that post-2018 regulatory framework should shed light on the future structure of the power supply market: open market or regulated monopoly. 3.2 We reckon that an open market would not always guarantee lower power price, price stability and high reliability, while regulated monopoly would not always mean higher power price. It all depends on how the industry is being regulated.
	3.3 Option 1 requires substantial investments in interconnecting and reinforcing the networks among CLP, HEC and CSG, and could be a preferred and logical outcome conducive to the development of free and competitive type of market structure.3.4 If CSG only serves as another power supplier buying power from within its territories and reselling the power to the existing

two Hong Kong utilities, we do not think Option 1 would lead to an open and competitive market in generation as the number of wholesale power suppliers merely increases from two to three. Heavy investment already sunk in cross border transmission, earmarked at HK \$30,000 million and long term supply agreement with CSG, would represent hurdles to future opening of wholesale power market and any changes in supply arrangement that may be required from time to time for compliance with Energy Policy Objectives.
3.5 When CSG only involves in delivering power and is paid for the delivery service provided only, and Hong Kong utilities directly negotiate with and purchase from several independent power producers within CSG territories in Guangdong under conventional commercial terms and conditions, the appropriate scale of investment in cross border transmission would then be more dictated by the market and supply requirement, less by administration directives. Option 1 would lead to a more open market type of structure in wholesale electricity supply.
3.6 We reckon that Option 2 prefers the status quo unchanged as a regulated monopoly structure as the limits in siting power stations in Hong Kong could restrict the number of independent power producers thereby affecting the market efficiency in the wholesale electricity supply. Nevertheless, a step by step approach is available to Hong Kong in retiring existing old coal fired units and installing new generation units of appropriate fuel, size, and technology, to meet our Energy Policy Objectives, Fuel Mix targets and load increases. As when Hong Kong is ready for power market opening, stranded costs, if any, would be relatively lower and negotiable with utilities. HKSAR government will also have better control over supply reliability and environmental performance. Any tariff increases will be more gradual and under affordability check.
3.7 Since both Options seeking public consultation meet our Energy Policy Objectives, we consider that whichever type of market structure is selected would more likely direct to which Fuel Mix Option. We, therefore, consider that it is the post-2018 regulatory framework post would more likely set the scene for future fuel mix, not as it is described in the Consultation Paper.
3.8 HKSAR government has yet to release a more comprehensive consultative paper on the market structure of post-2018 regulatory framework as such structure would help us in Fuel Mix selection. We urge HKSAR government to do so as soon as possible.

	3.9 For the regulated monopoly type of structure, the issues covered should extend beyond what are currently provided for in the prevalent Scheme of Control. More aspects such as return level, rate base, system expansion and capital expenditure, energy saving and environmental conservation, connection of renewable energy and self generation by customers, transfer of power among customers, penalties and rewards, and more transparent regulatory means, fuel pass-through mechanism, etc are to be put under regulatory review and control.
	3.10 For the market type of structure, open market in generation, transmission and distribution markets; competitions under short term and long term supply commitments; independent transmission operators; reliability standard; environmental regulation, necessary legislation requirement; independent regulators, antitrust requirements, experience in other parts of the world, pros and cons in power price level and stability, technical implications, politics involved, community preference, implementation timelines and roadmaps etc. should be well considered before a final decision is made on this market structure.
	3.11 We consider that there is a need for setting up a more proactive independent regulator as in developed countries for more openness, fairness, transparency and accountability in regulatory actions, directives, public hearing and information dissemination under whatever market structure chosen.
	3.12 The post-2018 regulatory framework should facilitate the implementation of Energy Objectives, and Fuel Mix, whichever options are chosen.
4) Fuel mix revamp	Techno-economic perspectives
Our Views	4.1 The present Consultation Document does not reveal technical and economic implications of Option 1 and Options 2 in any details.
	4.2We consider the technical implications are the key in achieving necessary reliability level and also have economic consequences. The technical perspectives of electricity supply industry are wide as described in following paragraphs and should be well taken for feasibility and comparison studies under Option 1 and Option 2.
	4.3 Clean coal technology is well proven and advanced to a more matured state except for carbon capture technology. Coal fuel is

mined worldwide in political stable areas and price is lower than other liquid and gaseous hydrocarbon fuels. Coal fired generation with clean coal technology meeting environment standards should not be ruled out in fuel and generation mix.
4.4 We do not see any specific policy, such as a ceiling or cap, on greenhouse gas emission in Consultation Document. We suggest including the possibility and a mechanism of carbon trading with renewable energy producers in Asia for lowering implementation costs under certain carbon dioxide emission cap that may be required under international protocols in a way similar to what are allowable in EU countries. There are more challenges under Option 1 in respect to carbon emission control than under Option 2 as HKSAR government might not have direct control over cross-boundary electricity generation.
4.5 How Hong Kong purchasing power program from CSG is devised and realized to meet total retired capacity during 2017 and 2023 period, which would amount to 700 to 1400 MW in CLPP and 500 to 750 MW in HKE under Option 1, would affect supply reliability to HK customers. Any delays or deficit in amount supplied, or load growing more than expected would cause power supply vulnerable unless a very successful power saving program is to be implemented in the coming years. If the purchasing power program and capacity retirement program are not well consistent with each other and implemented as scheduled, the resulting risks in supply reliability and costs to the society could be huge and our Energy Policy may be contradicted as well. Enforcement of commercial power supply agreements could be a problem under continuous shortage of power supply, e.g. prolonged draft seasons in South China.
4.6 Under Option 1, if Hong Kong simply buys power from CSG, Hong Kong would then not have direct control of the sources of the power. The amount of additional reserve capacity for the non- delivery of power due to power supply and demand conditions in CSG, loss of transmission links to Hong Kong, and peak load forecast errors need to be factored into (i) the reliability and environment outcomes and (ii) the minimum reserve plant margin and operating margin to be provided by HK utilities. Necessary generation reliability study should be carried for determining additional reserve capacity requirement in Hong Kong that would bring the two options to the same comparable reliability level. The associated costs should be factored into Option 1 for comparing with Option 2.

4.7After reviewing possible load growth pattern, retirement of aged generating units and system security requirement, we consider that power purchase from CSG may not be enough under Option 1 and new units still need to be installed in Hong Kong. Post-2018 regulatory framework should have provisions for such new unit additions in Hong Kong.
 4.8 HKSAR government should take the lead and work together with CLPP, HKE and CSG in comprehensive power system design and operation studies under Option 1. At present, we know very little about the results of such studies and therefore tend to think that any studies done already may not be up to the sophistication level required. Only when such studies are done and associated costs are estimated, ultimate all-in costs of power to Hong Kong customers under Option 1 would be clear. At present, we envisage likely problems as follows: System and Voltage Stability Problems due to the additional 3,000 MW plus load being added to the existing transmission links running from north to south to the load centers at Guangzhou, Dongguan and Shenzhen and existing nuclear transmission system at Daya Bay during certain loading and outage conditions; Load Control and Loop flow problems due to differences in impedances between the transmission circuits from CSG to CLP and HKE, long distance power transfer of significant amount, additional phase angle transformers and other power control equipment may need to be installed. High Cost and Schedule Uncertainty possibly due to likely significant cost overrun and schedule delays in land acquisition and relocation compensation for CSG transmission circuits to CLP and HKE.
4.9 We believe that the technicality under Option 2 are much simpler and can be handled by the two supply companies as they are used to in the past. However, we reckon that increase in the amount of natural gas for generation required could justify direct purchase of LNG in international markets and either owning a separate LNG terminal in Hong Kong or arranging tolling arrangment with a nearby LNG terminal in south of Guangdong for power generation and other hydrocarbon fuels users in Hong Kong. Such additional LNG sources would greatly enhance price stability and economics, and diversity of fuel supply.

4.10 Government should employ full time independent technical
and financial consultants and/or establish its own teams with
specialties in the power market and supply industry for timely,
accurate and comprehensive studies of and advices on all aspects
relating to market structures, generating costs analysis,
environmental impacts, power systems and power engineering. The
government/consultants should publish its reports on the status of
the power supply industry, short and long term planning
recommendation of all aspects related to retirement and additions of
generation units, system expansion and operations, sales and
revenue, financial conditions and costs of electricity, environmental
performance, reliability outcome, future growth and challenges
including likely market structure changes. International references
in this regard should also be learnt and taken.
4.11 A fully integrated national grid might be ready by around
2020. An opportunity could be available by making use of free
market forces in realizing our Energy Policy. Post-2018 regulatory
framework and Fuel Mix decision should have provisions to take
such opportunity should it come up.

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5) Timeline and	For years 2014, 2015, 2018 and 2023			
Roadmap				
Our Views	 5.1 We interpret Public Consultation on the Future Fuel Mix for Electricity Generation respects to the development of regulatory framework as follows: Option 1 is more conducive to the opening up the present regulated monopoly power market only when CSG only involves in delivering the power through its networks, and Hong Kong directly purchases power from several independent power producers in Guangdong under conventional commercial agreements. Option 2 is more conducive to maintaining the current status quo. Based on the decision of Fuel Mix option in 2015, there could be considerable implications to likely changes to the power market structure in 2018/2023. A regulatory framework of the Hong Kong power supply market be finalized in 2018 and a clear commitment for actions by 2023. 			
	5.2 Government should publish as soon as possible a timeline and			

roadmap for possible changes or no changes to the prevalent regulated framework after the conclusion of the prevalent fuel-mix consultation.			
 5.3 For whatever decision made out of the two options, there should be clear indication that HKSAR government is committed to a procedure that would lead to an ultimate decision on the market structure for power market on the basis of comparing the two market structure options as follows: Revision of the current Scheme of Control for a wider, more equitable and more transparent regulatory control framework leading to better performance in every respects, no excesses built-up of capacity and capital expenditure, and capital return at a level commensurate to the risks taken; and Restructuring the existing regulated monopoly to the establishment of a open market type of structure in generation (wholesale) or/and distributions (retail) in accordance with usual international anti-trust practices as in other developed countries and in compliance with the prevalent Energy Policy Objectives. 			

6)	Summary of response to the consultation paper		
Our Views	6.1 The proposed Energy Policy Objectives statement looks reasonable but need further interpretation, extensions for wider perspectives, and inclusion of appropriate implementation mechanism to achieve such objectives.		
	6.2 Fuel Mix, though a primary means, should not be the only means to implement Energy Policy. Other alternatives for both short term and long term scenario should be considered and a final most cost-effective one selected.		
	6.3 We believe that it is the post-2018 regulatory framework, not the Fuel Mix options, should shed light on the future structure of the power supply market: free market or regulated monopoly. We urge HKSAR government to disclose where the power Under Option 1 comes from: (1) CSG purchasing power within its grid and reselling to Hong Kong, or (2) CSG delivering power that Hong Kong directly purchases from several independent power producers within CSG territory. The sources would affect the future direction of our market restructuring.		

6.4 Comprehensive comparisons of the two fuel options from social, technical, reliability, economic and environmental perspectives should be carried out such that costs of electricity and other qualifications under both fuel options could be available for costs and benefits analysis and comparison. Without comparisons in such details and wider scope, any choice between Option 1 and Option 2 could only be preliminary, an indication of preference and subject to final review and decision.
6.5 Technical and economic implications should be carefully explored under Option 1 and likely impacts and associated risks on the supply and power system vulnerability as well as costs uncertainties on power price be identified and mitigated as necessary. Under Option 2, the requirement of direct LNG purchase and either building a LNG terminal in Hong Kong or arranging a tolling with nearby LNG terminals should be visited.
6.6 HKSAR government should announce timelines and implementation roadmap of actions leading to the ultimate decision on the regulatory framework after 2018/2025 and the choice of market structure as soon as the current consultation is completed.
6.7 Establishment of an independent regulatory authority dedicated to the power supply industry should be taken

香港客老服務協會

The Elderly Services Association of Hong Kong

檔案編號: KC171-2014 致:環境局電力檢討科 香港添馬田美道二號 政府總部東翼 15 樓

敬啓者:

本會就政府最近的未來發電燃料組合諮詢文件,現向 環境局電力檢討科提出有關回應,祈望局方加以考慮。

本會於一九八三年成立,經歷四份之一個世紀,『協 會』成立宗旨主要團結同業和交流管理經驗,同時『協會』 也作為業界與政府相關部門的溝通橋樑,努力為業界爭取 合理的權益,致力提昇業界的服務質素水平。

本會認為在考慮未來發電燃料組合時,應著重有關方 案在安全和可靠性的表現,我們協會轄下的護理院、護管 院在照顧長者時,需要使用不同種類的電動儀器,有些儀 器需要長時間,甚至乎24小時運作,機構並沒有自設後備 發電設施,故任何停電事故將會對長者帶來危險和不便。

以上為本會表達的意見,希望政府考慮。

此致



陳志育 謹啓 2014年6月15日

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季港科技協進會



The Hong Kong Association for the Advancement of Science and Technology Ltd.

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Ref: 2014061701

17th June 2014

Mr. KS Wong Secretary for the Environment Electricity Reviews Division Environment Bureau 15/F, East Wing, Central Government Offices 2 Tim Mei Avenue Tamar, Hong Kong

Public Consultation on Future Fuel Mix for Electricity Generation for Hong Kong

With reference to the captioned Consultation Document, I am pleased to furnish the views from some of our Council Members subsequent to the forum supported by the Hong Kong Association for the Advancement of Science & Technology (HKAAST) with the Institution of Measurement & Control, Hong Kong (InstMC HK) at Hong Kong Polytechnic University N002 on 9th June 2014 and the seminar organized by the HKAAST & co organized by the InstMC HK at the HKAAST on 17th June 2014.

As highlighted during the said forum, without detail and forecasts for either option for a reasonable cost projection, it seems unconvincing that the generation cost would be double; it is not prudent to comment which option would be more reliable, environmentally and economically better, due to inadequate information from the Consultation Document. More public discussions would be required and more options should be considered for a sound decision.

We have the understanding that Hong Kong has been receiving power from Daya Bay Nuclear Power Station for around 20 years positively; it is through a dedicated link connecting the said station to Hong Kong direct. Technically, there is an interlock to separate from the Guangdong grid during instability in China; for Option 1, such technical arrangement requires to be addressed.

Environmentally, if it is our intention to reduce coal firing units in Hong Kong, Option 2 appears to be more appropriate by using more relatively cleaner natural gas. For Option 1, the sources of generating plants are unknown; hence, the emissions reduction could not be quantified. During the forum, it was claimed that the emissions of Option 1 would be more as the fuel would very likely to be coal.

Safety

For safety issues, the HK Electric and CLP Power are performing! According to the record, we could have our power generated, transmitted, distributed safely, in case Option 2 is adopted.

Reliability

The reliability of Hong Kong electricity supply is 'Number 1' in the world. In Hong Kong, we are talking about several minutes of unplanned customer interruption annually; reliability is measured in hours per year in China. It is expensive for our generating plant to be at hot/warm standby mode to be ready for the load demand when there is a failure of power from China.

Affordability of Electricity Price

For Option 1, the variables include inflation in China and status of RMB.

Environmental and Sustainability Performance

For Option 1, it appears that we are passing our emission reduction responsibility to China; it is considered that local gas generation is preferred for the ability of emission reduction at source.

Social Impact

For Option 2, local professionals and the related business partners could be benefited.

Yours sincerely,

Dr. Louis Lock PhD DBA HonDEng HonFUclan HonFSOE HonFIPlantE FHKAAST FHKIE FInstMC SrMCSEE RPE CEng CEnv CPPCC(NBBL) President The Hong Kong Association for the Advancement of Science & Technology

LS/ls

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附件

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請於2014年	6月18日或之前透過以下方式提交你的意見。
郵寄地址:	香港添馬添美道二號政府總部東翼十五樓環境局電力檢討科
電子郵件:	fuel_mix@enb.gov.hk
傳真:	2147 5834

第一部分(見註)

這是

☑ 團體回應(代表個別團體或機構意見)或
 □ 個人回應(代表個人意見)

及

Wildboar Company

(電話)

-

(個人或機構名稱)

(電郵)

第二部分

燃料組合

		輸入		Contract 1	12
嬔	料組合	核能 (大亞灣核電站)	從電網購電	天然氣	(及可再生能源)
現即	专 (2012)	23%		22%	55%"
***	通過從內地電	20%	30%	1409/	1000
7.44-1	新新希 <u>瓜</u> 樹入 更多電力	篇共:	50%	40%	10.75
方素2*	利用更多天然 氧作本地發電	20%		60%	20%

*以上的燃料比很用以提供一個基礎作誤影戰力供產所需的基礎。不同燃料的實際分配產按實際情況變定。

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第三部分

具體諮詢問題

問1: 就安全,可靠性,合理價格,壞保表現及其他相關的考慮而言,你對兩個燃料組合方案 有何意見?(請就每個方案説明你的看法)

方案	支持	不支持	不支持方案的原因 (可選擇多過一項)
1		Z	 ✓ 安全 ✓ 可靠性 ✓ 合理價格 ✓ 環保表現 ✓ 其他 (請註明):
2	2		 □ 安全 ☑ 可靠性 □ 合理價格 □ 環保表現 □ 其他(請註明):

問2: 你認為在兩個燃料組合方案中,哪一個較理想?為什麼?(請只選擇一個)

方	案	1		
t	家	2		

原因:(可選	擇多過一項)	
安全		
可靠性	1	
合理價格		
環保表現		
其他	前註明	-

1

第四部分

其他意見或建議

The SLA of power supply from Mainland China is much less than Hongkong. We've been investment on our infrasturcture base on the estimation of SLA of existing Hongkong power supply. The reduction of SLA will casue us to re-estimate the cost and investment on stabilize the power (e.g. increase the power bank unit), which could discourage the investment on Telecom industry in Hong Kong.