

Renewable Dialogue Workshop for Hong Kong



Study Report March 2018

Organisers



Co-Organisers



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Table of Contents



Sections

Page

1. Executive Summary	2
2. Project Overview	4
2.1 Objectives of this project	4
2.2 Significance	4
2.3 Collaborators	5
2.4 Methodology	5
3. Key Findings	9
3.1 Key finding 1: Participants are generally supportive to REFIT	9
3.2 Key finding 2: Participants generally agree that REFIT payback period should be shortened to less than 10 years. Several critical elements of REFIT needs to be well-designed, and be clearly informed to the public	12
3.3 Key finding 3: Participants raise concern on the equity issues of REFIT (cross-subsidisation)	14
3.4 Key finding 4: Participants in general were supportive to renewable energy certificates, but became less supportive after deliberation	16
3.5 Key finding 5: Legal and technical barriers are major obstacles to solar panel installation but having REFIT could not address these barriers	19
3.6 Key finding 6: Participants are skeptical if the Government truly wants to advocate renewable energy development on a long-term basis	21
3.7 Key finding 7: Participants' also ask for more Government's actions and support in addition to providing REFIT	22
4. Policy Recommendations	24

Appendices

Appendix 1: Pre-workshop questionnaire and post-workshop questionnaire (Chinese version)	
Appendix 2: Selected quotations that can be found throughout the report	
Appendix 3: The briefing document that was provided to all workshop participants several days prior to the workshop	
Appendix 4: List of expert panelists at the workshop	

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1. Executive Summary



Renewable energy (RE) development receives more and more attention in the world. From developed to developing countries, RE development has been becoming a key focus on government agenda. In the wave of growing concern in climate change and carbon reduction advocacy, the Hong Kong Government reached agreements with the two electricity companies in Hong Kong and introduce the first and major RE policy, namely Renewable Energy Feed-in Tariff (REFIT), first in October 2018 to promote RE development.

The framework of REFIT policy was laid out under the new Scheme of Control Agreements (SCAs) with the two electricity companies in Hong Kong. Under the SCAs, China Light & Power (CLP) would first introduce REFIT by October 2018 followed by Hong Kong Electric (HKE) by January 2019. Despite such implementation plan, the foreign experiences of REFIT inform us that REFIT design, implementation and practices might give rise to controversies and challenges. How should we design and implement REFIT policy in order to maximise the benefits for all stakeholders (including all Hong Kong citizens, the business sector, and the government), under the unique topographic and urban characteristics of Hong Kong?

In attempt to answer this question, Asian Energy Studies Centre, Greenpeace East Asia, and 350HK jointly organised the Renewable Dialogue Workshop for Hong Kong to provide critical understanding of Hong Kong citizens' opinions about REFIT policy, and how REFIT should be designed and implemented in Hong Kong. The objective of this study is:

1. To facilitate citizen engagement in REFIT policy discussion through dialogues and debates in small group discussions, expert Q&A and panel discussion;
2. To enhance communications among RE policy stakeholders through the formation of a working group which comprises stakeholders from utilities, the business sector, non-governmental organisations, and academics; and
3. To foresee potential areas of conflicts among policy stakeholders, and to inform decision-making and provide policy recommendations.

This study adopted a workshop format with small group discussions, expert Q&A, and panel discussion. The workshop format is inspired by the Deliberative Polling (DP) trademarked by the Center of Deliberative Democracy (CDD) at Stanford University. A targeted sample of 33 participants was drawn from (1) prospective solar photovoltaic (PV) adopters, (2) ordinary Hong Kong citizens, and (3) commercial, institutional and non-profit sector. The participants were asked to debate on the pros and cons of REFIT policy and engage in the expert Q&A and panel discussion. A set of pre- and post-workshop questionnaire were used to check the changes in opinions of the participants in this study.

Our study presents several key findings:

- Participants are generally supportive to the introduction of REFIT with around 68% of participants replied either strongly support or support after the workshop. Nearly 80% of participants considered little increase (less than HK\$20) in monthly electricity expenses for supporting RE development acceptable;
- Participants generally agreed that the payback period for RE system should be reduced from the present level to less than 10 years;
- Participants raised concerns about the equity issues from implementing REFIT for having the majority of people to bear the costs from REFIT to support a small segment of people who are able to install RE systems and earn REFIT;
- Participants were generally supportive to renewable energy certificates. Nearly half of the participants (45.5%) indicated they are willing to pay in a range of HK\$11 - 50 in purchasing renewable energy certificates monthly. However, they questioned if the present arrangements of renewable energy certificates are appropriate and became less supportive to renewable energy certificates after deliberation;
- Participants particularly concerned about the legal restrictions and technical barriers associated with solar panel installation at present and considered that having REFIT solely could not address these issues. These barriers include, but not limit to: height and area, building design, restrictions from management companies, uncertainty in legal and technical requirements, and the rights to be solar installers, etc.;
- Participants also suspected that if the Government has any long-term comprehensive plan for RE development as they could not see the visions, targets, and follow-up actions by the Government in RE policy-making; and
- Participants urged the Government to take more actions and provide more support in providing more supplementary RE development policies, providing more subsidies, and resolving the legal and regulatory barriers.

This study report is organised into four sections. Following this executive summary, Section two – **Project Overview** describes the objectives, significance, collaboration and methodology of this study. Section three – **Key Findings** reports on the main findings from the workshops and the questionnaires. Section four – **Policy Recommendations** provide suggestions on REFIT implementation to help promote RE development in Hong Kong.

2. Project Overview



2.1 Objectives of this project

- To facilitate citizen engagement in REFIT policy discussion through dialogues and debates in small group discussions, expert Q&A and panel discussion;
- To enhance communications among RE policy stakeholders through the formation of a working group which comprises stakeholders from utilities, the business sector, non-governmental organisations, and academics; and
- To foresee potential areas of conflicts among policy stakeholders, and to inform decision-making and provide policy recommendations.

2.2 Significance



1. We utilised a new way of inviting public input into energy policy-making:
 - a) Multi-stakeholder: Potential solar PV adopters who are house owners, ordinary citizens from the general population, as well as participants from commercial and institutional sectors.
 - b) Deliberative: We hear different views, clarify issues, debate, dialogue and feedback. The process empowers engaged and informed participants to take a proactive role in clarifying and debating key issues.
 - c) Well-structured workshop: The various components that make up the workshop is designed to deliver a balanced event that includes elements of informing, engaging and listening to facilitate knowledge exchange and citizen engagement.
2. Policy implication: Our findings can help the government, utilities, and other policy stakeholders to critically assess REFIT under the new SCAs with the two electricity companies in Hong Kong and brainstorm ideas for addressing potential stakeholder conflicts.
3. Robustness in analysis: We employed a multi-method approach which includes desk-top study, deliberative workshop, pre-and post-workshop questionnaires, and an online interactive element (Hong Kong Solar Map).

2.3 Collaborators



Organisers: Asian Energy Studies Centre at Hong Kong Baptist University



Co-organisers: Greenpeace East Asia, 350HK



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2.4 Methodology

Composition of workshop participants (Total workshop participants: 33)

11 Prospective
Solar PV Adopters



7 Hong Kong
Ordinary Citizens



15 Commercial,
Institutional and
Non-profit sector
Participants

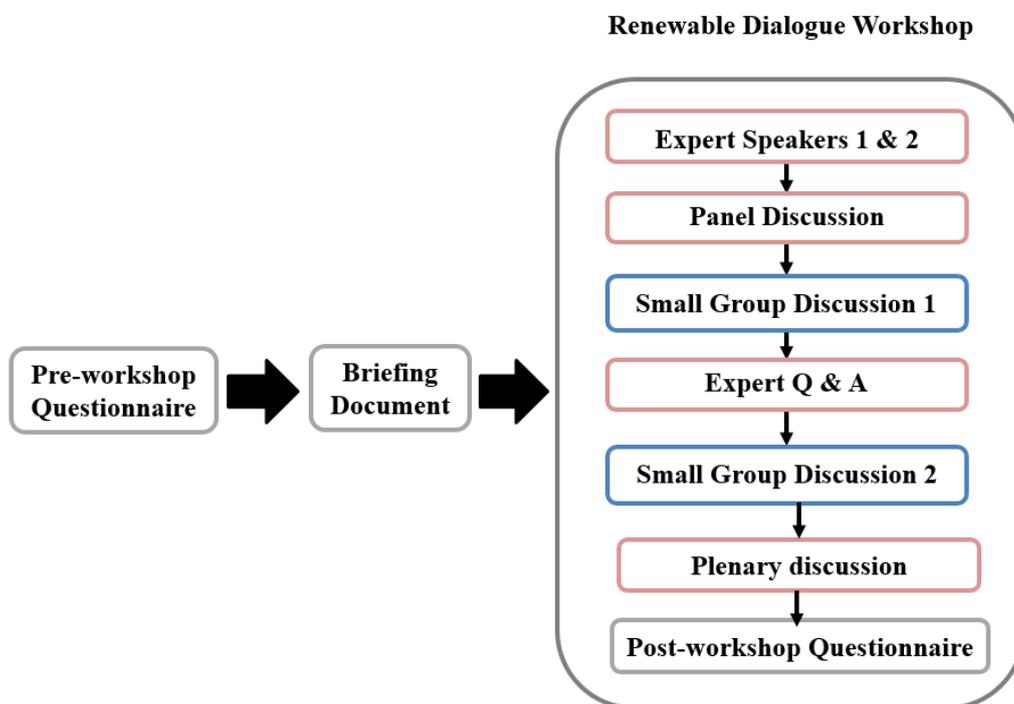


Prospective solar PV adopters (n=11): Some of these participants were recruited from our database of former workshop participants. They had participated in our previous solar energy workshop in 2016 titled “Attitudes and perceived drivers and barriers to solar policies: Perspectives of stakeholders in Hong Kong”. They are residents of low-rise residential blocks (e.g. Fairview Park, Hong Lok Yuen) and village houses. The rest of these prospective solar PV adopters were recruited through our research team’s network. The input from these participants helps us understand the concerns of prospective solar PV adopters and the problems they face.

Hong Kong ordinary citizens (n=7): These participants had also participated in our abovementioned solar energy workshop in 2016. At the time they were a gender-balanced group of adults sampled from the general population in Hong Kong through The University of Hong Kong’s Public Opinion Programme, a professional polling institution. The opinions of these participants can suggest how the general public may react to RE policy issues.

Commercial, institutional and non-profit sector participants (n=15): We recruited these participants through the existing contact networks of AESC, Greenpeace and 350HK. They come from a wide variety of backgrounds including renewable energy services, financial services, politics, public policy, aviation, utility, education, research, and non-profit work.

Workshop format



The format of this workshop was inspired by an innovative deliberative participation method called Deliberative Polling (DP) trademarked by the Center of Deliberative Democracy (CDD) at Stanford

University, which integrates deliberative practices into the polling process and overcomes limitations of traditional polls such as being static, revealing only snapshots of public opinion, and having generally ill-informed respondents.

Our workshop incorporated several key elements of DP, namely the briefing document, small group sessions, expert Q&A sessions and the pre- and post-workshop questionnaires. The details for these elements will be discussed in the next few subsections.

Qualitative data was collected from desk-top research and transcribed materials of the workshop small group and expert Q&A sessions, while quantitative data was collected from pre- and post-workshop questionnaires.

[Please refer to the Appendix for the following information:

Appendix 1: Pre-workshop questionnaire and post-workshop questionnaire

Appendix 2: Selected quotations that can be found throughout the report

Appendix 3: The briefing document that was provided to all workshop participants several days prior to the workshop

Appendix 4: List of expert panelists at the workshop]

Research method of small groups

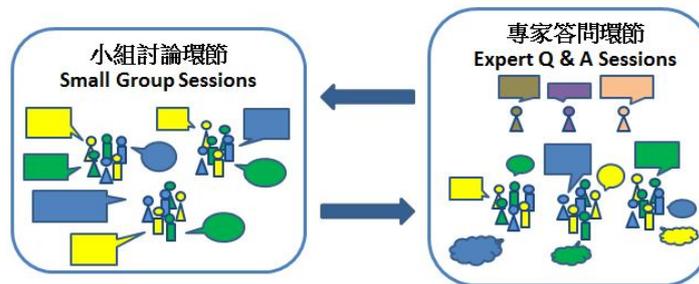
The participants were divided into three groups (A, B and C) for the afternoon small group discussions, and each small group was assigned representatives from all three stakeholder groups. The small groups were facilitated by our trained moderators, and the discussions were recorded and transcribed.

The composition of each small group was as follows:

	Group A	Group B	Group C	Total
Prospective Solar PV Adopters	4	3	4	11
HK Ordinary Citizens	1	3	3	7
Commercial / institutional/ Non-profit	5	6	4	15
Total:	10	12	11	33

Note: We used the video footages from the first small group discussion session to determine the numbers above.

Expert Q&A session



Participants were encouraged to raise questions and play a proactive role in the deliberative discussion sessions. We included three rounds of Q&A sessions to facilitate in-depth discussion of the key issues:

1. Panel discussion: right after expert speakers' talk – answer questions that came up during the expert talks
2. Expert Q&A: after the first small group discussion – summarise key findings and questions from small group discussions
3. Plenary discussion: after the second small group discussion – conclusion for the workshop

Briefing document and questionnaires

The briefing documents were sent out a few days before the workshop to participants, to provide background information on REFIT in Hong Kong, explain the purpose and format of the workshop, and brief them on the key issues to be discussed.

The pre-workshop questionnaire and the post-workshop questionnaire were completed by participants before and after the workshop respectively. The questionnaires helped us assess the level of energy literacy among the participants, their attitude towards RE and REFIT before compared to after the workshop, and gather their demographic information. We have collected 22 sets of valid pre-workshop and post-workshop questionnaires for conducting quantitative analysis.

3. Key Findings

3.1 Key finding 1: Participants are generally supportive to REFIT



Participants generally agreed that Hong Kong should develop renewable energy as one of the energy source. Participants were asked to fill in a set of pre- and post-workshop questionnaires before and after the deliberative workshop. Figure 1 show that over 90% of the participants agreed to the statement “renewable energy should be part of the energy mix in Hong Kong” before and after the workshop. The results suggest that participants were generally in support of renewable energy in terms of contributing to local energy mix.

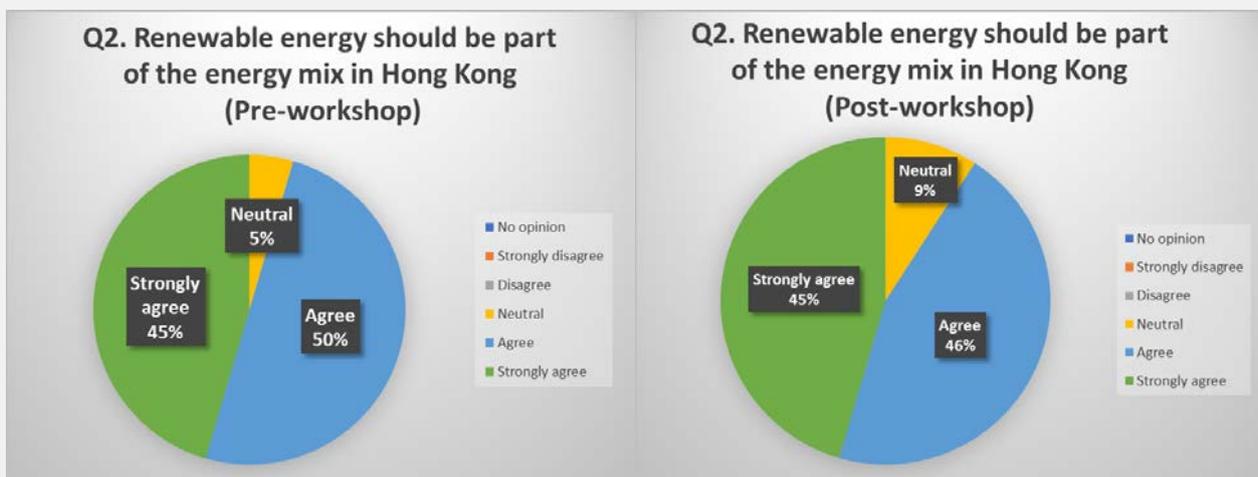


Figure 1: Participants’ opinions on renewable energy as part of the energy mix in Hong Kong (n=22)

With respect to the support of REFIT introduction in Hong Kong, **participants were generally supportive to the policy but becoming slightly more hesitant in REFIT after deliberation.** As shown in Figure 2, the post-workshop result suggested a support rate of 68% (including strongly support and support) reduced from 77% in the pre-workshop investigation. The loss in support (9%) became neutral after the deliberation process. This result may imply that although participants welcomed REFIT introduction, they concerned about whether REFIT can effectively resolve the problems associated with promoting renewable energy generation systems among households. These concerns and problems would be discussed in the following key findings.

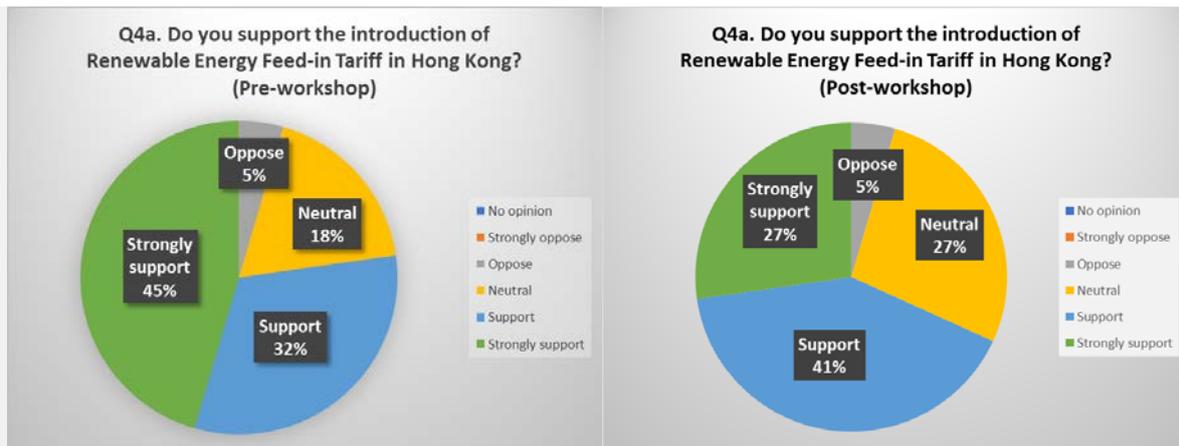


Figure 2: Participants' level of support on REFIT (n=22)

In addition, participants were asked on the acceptance level for the monthly tariff increase for supporting renewable energy development. **As shown in Figure 3, nearly 80% of the participants considered “Not more than HK\$10” and “HK\$ 11 - 20” of monthly increase in electricity expenses acceptable after the workshop.** The results imply that participants are willing to accept mild rate of tariff increases for supporting the development of renewable energy.

The acceptance level dropped for larger amount of tariff increases after the deliberation. When comparing the difference before and after the workshop, minimal amount of increase in electricity expenses is more acceptable than higher amount of increase in expenses after the workshop. For “HK\$ 11 - 20” and “HK\$ 21 - 50” in tariff increase, the total acceptance level (perfectly acceptable and acceptable) increased after the workshop while it remained about the same for “Not more than HK\$10”. For “HK\$ 51 - 100” and “HK\$100 or more”, the acceptance level slightly decreased after the workshop.

It is also noticeable that the proportion of participants reported neutral for the tariff increase diminished and the unacceptance level (unacceptable and totally unacceptable) rose after the workshop in tariff increase levels for “Not more than HK\$10”, “HK\$ 51 - 100” and “HK\$100 or more”.

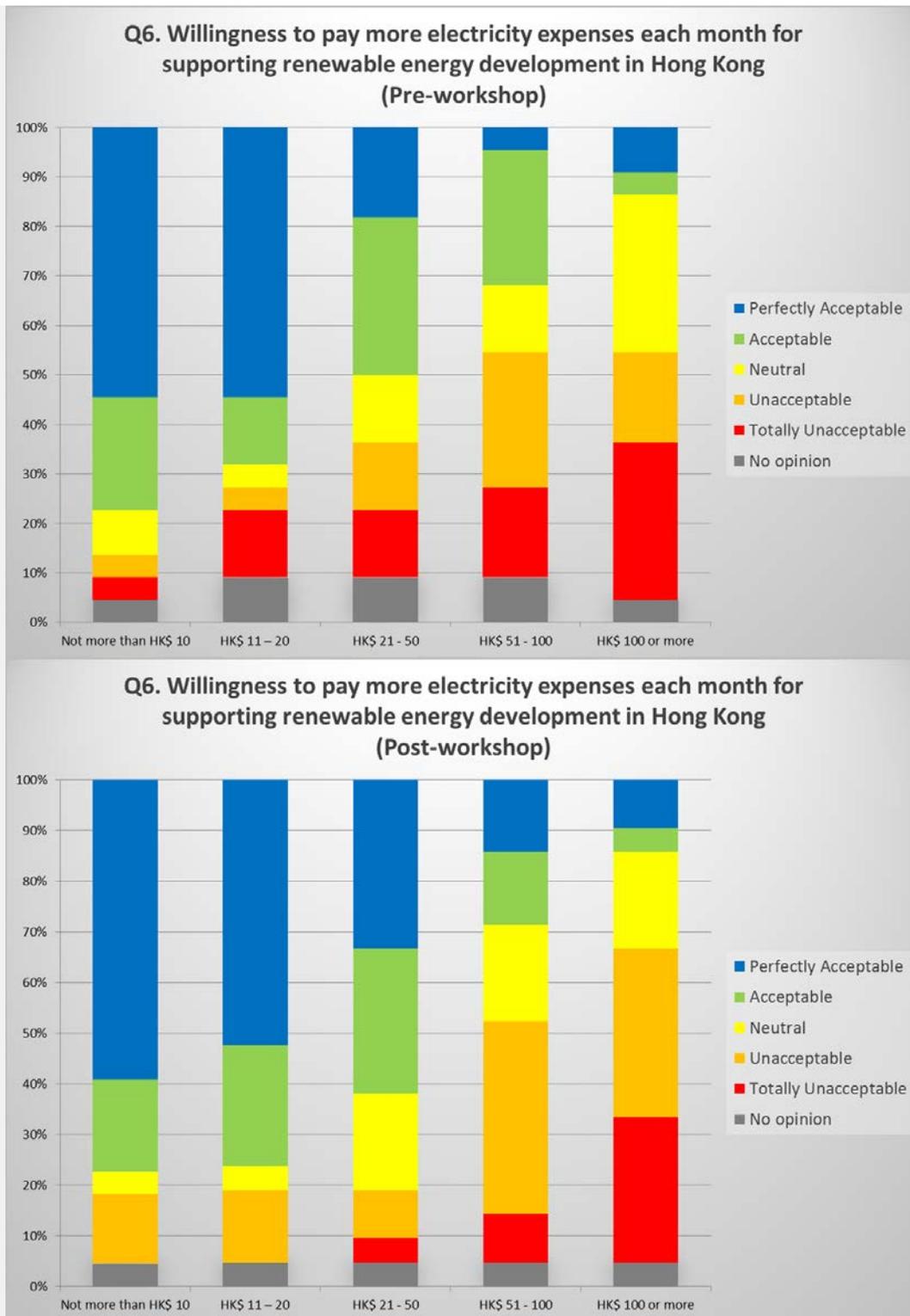


Figure 3: Participants' level of acceptance on monthly rise in electricity expenses for supporting renewable energy development in Hong Kong (n=22)

3.2 Key finding 2:

Participants generally agree that REFIT payback period should be shortened to less than 10 years. Several critical elements of REFIT needs to be well-designed, and be clearly informed to the public



Payback period has been a key issue in promoting household installation of renewable energy generation systems. Participants suggested different ideas when they discussed on what meant by a suitable payback period for household installation of renewable energy system. Yet they unanimously reflected that the payback period should be reduced from the current situation, and a majority of them considered less than 10 years as a suitable payback period. While 10 years was considered suitable, some participants suggested an even more aggressive payback period. Table 1 summarises the opinions on payback period:

Table 1: Summary of participants' opinions on payback period of household renewable energy generation system installation

What meant by suitable payback period in renewable energy generation system?

- 8 - 10 year payback period is suitable given that the current payback period can be up to 28 - 33 years.
- 6 - 7% investment return is suitable.
- Payback period should be around 3 - 5 years.
- More than 5 years would become uncertain whether the payback period can incentivize people.
- Payback period should be as short as possible.
- The level of REFIT is crucial to increase attractiveness.

In addition to discussing payback period in financial terms, some participants opined that it may not be objective if the opportunity costs associated with the rooftop (space for installing renewable energy generation systems) are not taken into account:

Quote 1

「頭先講到回報係主要關嗰個裝置嘅成本，但其實除咗裝置成本之外，仲有其他既 opportunity value。咁當然依家係有兩條數，一條數就係淨裝個回報期係八至十年，我覺得都好似幾合理，但其實除咗裝置本身既價值之外，如果我願意去發電，我係會付出天台，個天台係一個價值黎嘛，或者我既花園，咁嗰啲價值其實就好似我地買樓建築面積，成個面積就講緊嗰嚟嘢實際幾多。除咗咁我仲要加一啲價值落去，我先攞到嗰啲回報，件事仲要睇得再闊少少，八至十年既實際回本我覺得都 look reasonable，但係我亦都睇唔好啲人覺得咁你無著數一年賺成 11、12 個%，其實唔係咁計，應該係睇埋我仲要付出左啲乜嘢，然後再計埋 solar energy，如果計埋可能得 5%，但係如果我都肯，咁其實呢個都係一個。」

R15 // Group A Small Group Discussion 1

In terms of how to set up a suitable level and design a system to determine the rate of REFIT, participants offered various ideas and approaches. Participants also required that critical design elements of the REFIT, e.g. the rate-setting formula, should be widely publicised and understandable to the public. Table 2 provides some suggestions on the design of REFIT.

Table 2: Participants' suggestions on the design of REFIT

Element	How should the Government design REFIT?
<i>Clarity</i>	<ul style="list-style-type: none">• A clear calculation on REFIT
<i>Providing model examples</i>	<ul style="list-style-type: none">• To have a real life example such as a house in Fairview Park to illustrate the payback period before and after REFIT is implemented
<i>Market-determined systems</i>	<ul style="list-style-type: none">• REFIT can be determined by free market
<i>Regression systems</i>	<ul style="list-style-type: none">• A regressive REFIT is suggested for higher income households or large-scale solar photovoltaic (PV) installers

3.3 Key finding 3:

Participants raise concern on the equity issues of REFIT (cross-subsidisation)



Both positive voices and concerns were present when discussing on the equity issue of REFIT to the society. As mentioned in the briefing document of this deliberative workshop, cross-subsidisation happens when an indirect wealth transfer occurs from less affluent to more affluent households through the earning of REFIT; less affluent households are generally not capable of providing space for renewable energy generation system.

Some participants were sensitive to the unequal treatment to the underprivileged groups in cross-subsidisation and raised concerns to the REFIT policy:

Quote 2

「……我作為一個公屋租戶，我只不過係一個租客，但業主係政府。咁如果我哋喺呢個計劃入面，作為一個公屋租戶，我哋電費要照樣交，但係我哋冇任何……即係如果真係話交叉補貼，我哋可能係受影響的一群。電費我哋每日都要計，我哋係消費者，我哋交既電費可能好少，但係因為呢個政策之下可能會受影響，從而交多咗電費去補貼一啲呢個政策既得益者。咁對我哋呢班公屋租戶嚟講，公唔公平呢？呢一個係一個好大既問題嚟。再者，從返香港嘅人口，個結構睇番，其實全香港人口，住喺公共屋邨嘅數目唔少，而呢個政策正正係會影響好大部分既一群人。」

R14 // Group C Small Group Discussion 1

Focusing on the righteousness of cross-subsidisation in the small group discussions, some participants highly concerned the arrangement for everyone or the majority of people to support only a small segment of affluent households. Some participants even suggested that the Government is actually subsidising the electricity companies instead of the people, while the burden of REFIT can be transferred to every electricity consumers by raising electricity tariff.

For the participants who were positive about REFIT, they focused on the long-term benefits of renewable energy development to the society and disregarded the unfairness of cross-subsidisation:

Quote 3

「……永遠無公義架喎，即係我都好抱歉呢個都有啲涉及經濟既問題……其實我確實係補貼緊你架喎，即係我係幫手比錢，嗰呢個就翻返去核心啦，就係我地翻返去本身我地為咩囉，無忘初心啊嘛，大家為咩先，我哋為下一代，即係為咗環境咁嘛，即係問心嘢句，其實唔好講下一代，自己都受緊害啦，下年又唔知升幾多度架啦，因此我覺得其實有時啲嘢兩相權衡取其輕，有時可能真係唔係一定要下下都係咁利益著眼既，我哋搞清楚個問題核心係咩嘢，咁如果大家明白咗，講真我補得你幾多咩，香港既電費根本已經好平，咁所以我覺得亦未必係市民唔接受既……」

R22 // Group B Small Group Discussion 2

Supporting participants suggested that benefits of renewable development are many: such as bringing a better living environment to the next generation, reducing air pollution, enhancing self-reliance on energy and importing less energy. They envisioned that the costs for subsidising renewable energy development would not be substantial, and that the benefits could be larger than the costs.

To resolve the issue of cross-subsidisation, participants suggested multi-folded measures, ranging from responsive design of REFIT to transferring burden from the less privileged to the others. Table 3 summarises the suggestions given by the participants.

Table 3: Participants' suggestions on resolving cross-subsidisation

Approach	Measure to resolve cross-subsidisation
<i>Exemption to low-income groups</i>	<ul style="list-style-type: none">To exempt some low-income groups, such as families below the poverty line or families receiving Comprehensive Social Security Assistance (CSSA), from bearing the costs of REFIT
<i>Exemption to non-solar households</i>	<ul style="list-style-type: none">To exempt households which are not capable of installing solar PV from bearing the costs of REFIT
<i>Progressive tariff design</i>	<ul style="list-style-type: none">To implement an even more progressive electricity tariff scheme to protect the low-income families
<i>Government subsidies to renewable energy system</i>	<ul style="list-style-type: none">To implement a solely government-funded scheme for (first time) solar PV installation
<i>Mandatory renewable energy purchase</i>	<ul style="list-style-type: none">To require electricity companies to use a small proportion of profits (surplus of or certain % of the permitted profit) to purchase renewable energy
<i>Eligibility of REFIT recipients</i>	<ul style="list-style-type: none">To regulate brownfield sites in generating renewable energy and obtaining REFIT

3.4 Key finding 4:

Participants in general were supportive to renewable energy certificates, but became less supportive after deliberation



When participants were asked about whether they support the introduction of renewable energy certificates in Hong Kong, a majority supported this system but the support rate (strongly support and support) significantly reduced from 82% to 59% after the workshop. On the contrary, the oppose rate rose from 0% to 14%. The results show that participants increasingly questioned the arrangement of renewable energy certificates as a means to support renewable development in Hong Kong after deliberation.

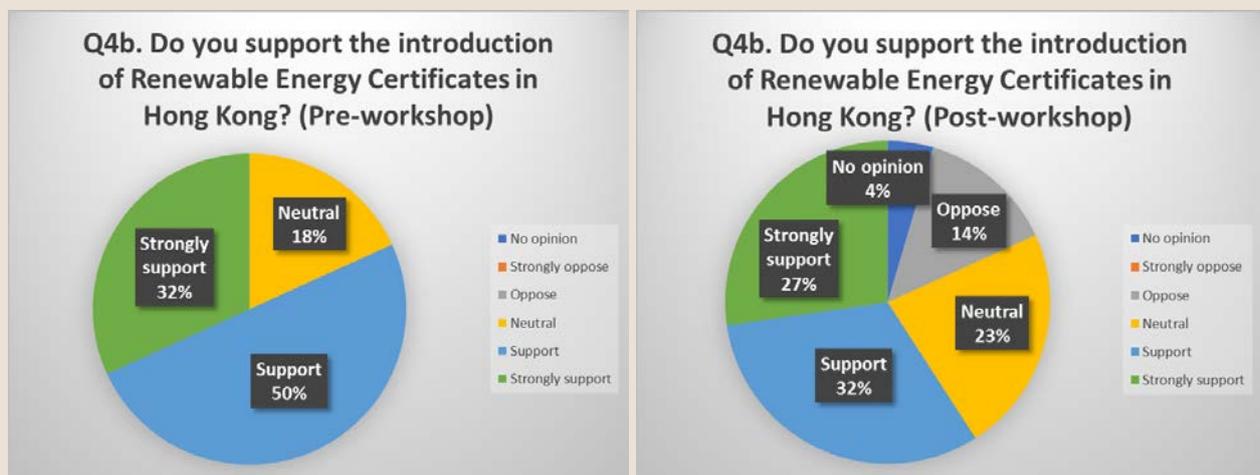


Figure 4: Participants' level of support on the introduction of renewable energy certificates in Hong Kong (n=22)

The arrangement of centralised selling of renewable energy certificates by the electricity companies was questioned by participants:

Quote 4

“...One other point is the RE certificates again in Schedule 5 are not owned by the owner of the Renewable Energy system. So if I put a system on my roof, I don't own the RE or the REC [Renewable energy certificates]. The utility owns the REC and the utility can sell them and use the profit, they have to use the profit to offset the cost of the scheme. In other words, it should reduce the increase in electricity prices with everybody would experience but nevertheless it is not mine to sell. So those two provisions are very unlike anything I have ever seen anywhere else in the world but they are logged in because the Scheme of Control has been agreed even though the Feed-in Tariff would haven't yet been finalized.”

Responses from Panel Discussion

Under the current REFIT proposal, a solar household or supplier has to sell the RE in order to get REFIT. This means that the right of REC has to be sold to the electricity companies. As such, individual RE supplier might not have the option to sell RE and REC directly to buyers as there might not be a RE exchange channel for such purpose.

Participant also suggested that commercial buildings should be required to mandatorily purchase renewable energy certificates, yet another participant raised the concern about the administration of renewable energy certificates:

Quote 5

「……無，其實我對證書有少少保留。不過我依家又諗唔到有更加好嘅辦法，因為始終做咗證書嗰個行政方面，或者執行方面都有好多都要睇，某方面係因為買證書嘅人因為佢自己，證書呢個措施一方面可以解決，當然亦都鼓勵咗另外一啲人，因為佢已經買咗證書，所以佢可以做啲對環境都無乜所謂，佢覺得已經付出咗 social responsibility。即係我自己對呢個仲有心結未完全解得開，不過我又無一個好好嘅建議。有時候就係覺得一個 social responsibility。」

R46 // Group A Small Group Discussion 1

When asked about their willingness to contribute to renewable energy certificates, participants' level of willingness recorded a mild decrease after the workshop. As illustrated in Figure 5 below, in general, nearly half of the participants (45.5%) indicated they are willing to pay in a range of HK\$11 - 50 in purchasing renewable energy certificates monthly. Specifically, the decrease in willingness is reflected by the slight increase in the percentage of participants choosing "I don't know/refuse to answer" after the workshop (from 18.2% to 22.7%). In terms of the willingness in the amount of monthly contribution, the percentage of participants for "HK\$11 - 20" (from 13.6% to 18.2%), "HK\$21 - 50" (from 22.7% to 27.3%), and "HK\$100 or more" (from 9.09% to 13.6%) increased while the percentage for "Not more than HK\$10" (from 9.09% to 4.55%) and "HK\$51 - 100" (from 27.3% to 13.6%) decreased after the deliberation. The results imply that participants had different responses after considering the opinions on renewable energy certificates during the workshop.

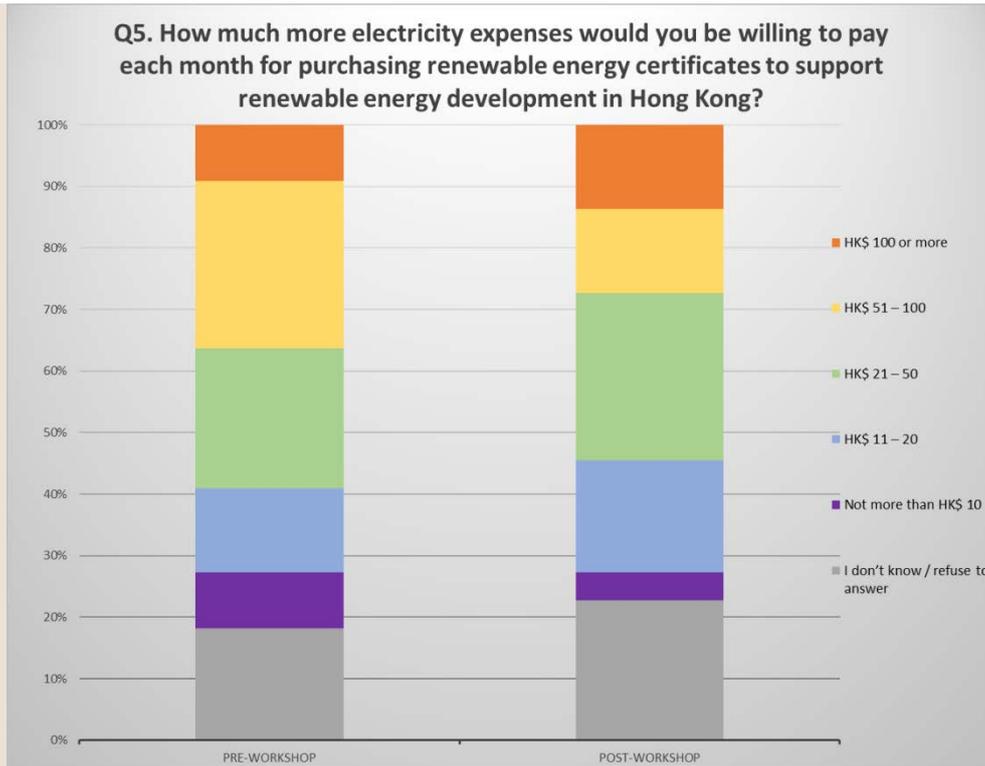


Figure 5: Participants' willingness to purchase renewable energy certificates (n=22)

3.5 Key finding 5:

Legal and technical barriers are major obstacles to solar panel installation but having REFIT could not address these barriers



Legal barriers

Strict legal and regulatory requirements are highlighted by participants as the major barriers to renewable energy generation system installation in addition to the issues brought by REFIT. Participants suggested two sources of restrictions, namely legal requirements and restrictions from management companies.

First, for rooftop solar panel installation in small houses and village houses, participants concerned that solar panels might be regarded as unauthorised or illegal structure in the following manners:

Table 4: Participants' concerns about rooftop solar panel as unauthorised or illegal structure in small houses and village houses

Criteria	Restrictions
<i>Height</i>	<ul style="list-style-type: none">As for village houses built under the Buildings Ordinance, installing solar hot water heating system or solar panels not higher than 1.5 metres on rooftop is permissible and might not require approval from the Buildings Department. For structures higher than 1.5 metres, it might be regarded as “additional structure/covering structure” (上蓋) if it is not properly applied to and approved by the Buildings Department. This kind of structure is illegal, and the structure might affect rates and government rent valuation.
<i>Area covered</i>	<ul style="list-style-type: none">Based on participants' understanding on the existing regulations provided by the Government, the area allowed for installing rooftop solar panels in small houses is just enough for putting 4 to 4.5 panels. The amount of electricity produced from 4 to 4.5 solar panels is negligible.
<i>New Territories exempted houses</i>	<ul style="list-style-type: none">The height and area restrictions do not apply to New Territories exempted houses. Instead, Lands Department specifies that the total gross weight of the facilities installed should not exceed 700 kg, and the average loading imposed should not exceed 150 kg/m². Any installed structures which do not comply with the Government's requirements for Green and Amenity Facilities in Building New Territories Exempted Houses are deemed illegal.

Second, participants pointed out that sometimes restrictions from management companies are overwhelming:

Quote 6

「……但係呢個管理處呢，佢係反對係個屋頂加呢啲既，佢個權利都好大下，咁所以就算我哋話我哋想做，佢一句話唔得，我哋已經無得郁架喇。即係如果唔係就要同佢打官司，我哋係 100%輸。」

R28 // Group A Small Group Discussion 1

While the power of the management company is guaranteed by the Deed of Mutual Covenants, some participants thought that the forbiddance from management companies is irresistible, and in some cases, it is to the management companies' discretion whether they would permit the residents to install rooftop solar panel.

Technical barriers

Even when REFIT is introduced, the technical barriers associated with renewable energy system still cannot be fully resolved. These barriers come from financial costs, externalities and concerns about responsibilities. Table 5 summarises the compound technical issues concerned by the participants:

Table 5: Technical factors which hinder the uptake of renewable energy system

Factor	Concern
<i>Installation/labour costs</i>	<ul style="list-style-type: none">Although hardware costs for solar panel have gradually decreased, installation costs surged due to expensive labour costs and the complicated application process. The labour costs keep on increasing such that the costs of the panel per se become less significant.
<i>Design of building</i>	<ul style="list-style-type: none">When the house/building is designed to install solar panels before construction, the house/building would normally have no problem associated with solar installation. However, participants concerned if the old houses/buildings, which are not designed for this purpose, would have a structural issue.
<i>Leakage</i>	<ul style="list-style-type: none">In addition to the structural issue, improper solar panel installation might often lead to leakage problem which affects the residents resided on the lower floors.
<i>Insurance</i>	<ul style="list-style-type: none">Participants are unclear about what kind of insurance they could purchase for the accidents arose from solar panel installation.
<i>Health issue</i>	<ul style="list-style-type: none">Participants worry if the solar panels would lead to adverse health effects and complaints from neighbours.
<i>Aesthetic issue</i>	<ul style="list-style-type: none">Neighbours and management companies might require that solar panels have to be installed in a certain direction or under a designated position of the rooftop so that solar panels would constitute a harmonised building environment.
<i>Fengshui</i>	<ul style="list-style-type: none">Neighbours might be against solar panel installation due to their concerns about <i>fengshui</i> of the environment.

3.6 Key finding 6:

Participants are skeptical if the Government truly wants to advocate renewable energy development on a long-term basis



Quote 7

「……而係話點先可以將呢一政策，呢個環保局既政策同兩電嗰個簽署咗既，一落實可以執行到，唔係一個口號，香港可能乜都有啦，求其啦，咁究竟係邊個去做呢？……政府唔可以留嚟一個口號，淨係環保局獨一去撐話呢個政策。你其他部門跨部門都要去配合架，政府正所謂要拆除鬆綁，點樣可以令到新界咁多的屋可以做到……」

R23 // Group B Small Group Discussion 1

Most participants raised concerns on the feasibility and applicability when they were asked about their impressions and opinions on the upcoming REFIT policy. The queries varied from the macro level, such as the strategy to promote renewable energy, to the micro level, including the technical barriers involved in solar panel installation at household scale. Table 6 summarises participants' concerns on Hong Kong's renewable policy:

Table 6: Summary of participants' concerns on Hong Kong's renewable policy

Criteria	Queries
<i>Visions, objectives and targets</i>	<ul style="list-style-type: none">Participants are not clear about the Government's visions, objectives and targets in developing renewable energy. They question whether the Government has any stand or she simply wants to observe market responses.
<i>Awareness in the current situation</i>	<ul style="list-style-type: none">Some participants query that the Government has a very low awareness about the current situation and have never touched upon the technical issues in renewable energy development.
<i>Devotion to promote renewable</i>	<ul style="list-style-type: none">Some participants think that the Government is reluctant to promote renewable energy, but only the scholars and green groups do.
<i>Sustainability of renewable policy</i>	<ul style="list-style-type: none">Some participants raise concerns on how long the policy will last. It is necessary to make it clear about policy sustainability prior to considering other issues.
<i>Actions in resolving technical barriers</i>	<ul style="list-style-type: none">The Government should take action to resolve the technical barriers instead of solely promoting with slogans or discussing on the rate of tariff.

3.7 Key finding 7:

Participants' also ask for more Government's actions and support in addition to providing REFIT

To resolve the legal, regulatory, and technical barriers, and improve the policy effectiveness of REFIT, participants suggested that the Government should further work in the following directions:

1. To set up demonstration sites and projects so as to provide evidence and inform the public about the effect of REFIT;
2. To introduce renewable portfolio standards or to mandatorily require solar panel installation in government and commercial buildings so as to help build up market demand and speed up the process of renewable energy development;
3. To utilise government buildings and facilities, and school buildings for solar panel installation;
4. To provide one-stop service for solar panel installation; and
5. To set up regulatory systems for solar panel suppliers and solar installers.

Table 7 summarises participants' suggestions to the Government for consideration:

Table 7: Participants' suggestions on resolving the legal, regulatory, and technical barriers and improving the policy effectiveness of REFIT

Suggestions	Illustration
<i>On renewable policy design</i>	
<i>Demonstration projects</i>	<ul style="list-style-type: none"> To set up demonstration sites or projects to validate the potential effect of feed-in-tariff, e.g., in reducing payback periods.
<i>Arrangements of REFIT and renewable energy certificates</i>	<ul style="list-style-type: none"> Detailed arrangements of the REFIT and renewable energy certificate implementation should be provided.
<i>Setting renewable portfolio standards</i>	<ul style="list-style-type: none"> To introduce a required percentage of renewable energy in the energy mix and require new buildings to install certain amount of solar panels.
<i>Rooftop renting</i>	<ul style="list-style-type: none"> Adopt a rooftop renting scheme for the Government to rent rooftops from small houses and high-rise buildings to install solar panels.
<i>Solar panel installation in public buildings and facilities</i>	<ul style="list-style-type: none"> The Government should consider installing solar panels on rooftops of public schools, government buildings, public rental housing, footbridges, reservoirs, open air carparks, bus stops, as well as Light Railway Transit stations.
<i>Utilise land near transmission towers to electricity companies</i>	<ul style="list-style-type: none"> Grant or by tendering the land near transmission towers to electricity companies for solar panel installation.
<i>Providing additional GFA</i>	<ul style="list-style-type: none"> Grant additional gross floor area ratios (GFA) to developers for installing solar panels
<i>On providing advisory services and subsidies</i>	
<i>One-stop services</i>	<ul style="list-style-type: none"> To provide “one-stop services” (一條龍服務) concerning all the installation barriers ranging from legal requirements, structural and safety, issues from property management companies, health, fengshui, etc.
<i>Consultancy services on installation barriers</i>	<ul style="list-style-type: none"> To require electricity companies to provide assistance regarding the installation barriers
<i>Critically evaluating the effectiveness of REFIT</i>	<ul style="list-style-type: none"> To follow-up cases of solar projects in order to evaluate the policy effectiveness of REFIT
<i>Subsidising solar panel purchase</i>	<ul style="list-style-type: none"> To provide direct subsidies for the purchase of solar panels in order to reduce the upfront costs
<i>On resolving the legal and regulatory barriers</i>	
<i>Establishing coordination committee</i>	<ul style="list-style-type: none"> To establish a coordination committee (協調小組/統籌小組) to resolve any matters arose from solar panel installations and to facilitate inter-governmental bureaus and departments to participate in “removing the walls and losing the ties” (拆牆鬆綁).
<i>Revising solar-related regulations</i>	<ul style="list-style-type: none"> To examine, revise, or remove regulations which may impose excessive control on solar panel installation.
<i>Regulatory system for solar panel suppliers</i>	<ul style="list-style-type: none"> To adopt registration, certification or licensing system for regulating solar panel suppliers to assist potential solar installers.

4. Policy Recommendations

Based on the aforementioned key findings in this study, we summarise and develop three policy recommendations for the Hong Kong Government and stakeholders to consider for the policy-making of REFIT and related RE policies.

Recommendation 1: Designing a comprehensive and responsive REFIT systems to satisfy stakeholders' needs and the majority

Many of the participants are supportive and looking forward to the announcement of the details of REFIT policy. As given in the key findings, participants showed different concerns in the upcoming REFIT policy, including a suitable rate of REFIT in reducing the payback period to an acceptable level, cross-subsidisation, sustainability of the policy, etc. We thus suggest that the REFIT should be designed in a way which can be responsive to the interests of different segments of the society.

Recommendation 2: Implementing measures which could effectively address the problems associated with solar panel installation which REFIT could not resolve

The legal and technical barriers are the major concerns to many potential solar panel installers. Owing to the historical development of the New Territories, different requirements and restrictions apply to village houses and New Territories exempted houses. Some participants voiced that the current regulations for both types of low-rise buildings only allow village houses to install solar panels with negligible capacity. Therefore, the guidelines, requirements and application channel for solar panel installation should be clearly provided in a one-stop platform to ease the uncertainties among to potential installers.

Recommendation 3: Engaging the public in participating RE development

While there are some promising measures in green policies provided by the Government, such as the green bond issuance programme and the Green Bond Grant Scheme suggested in the 2018-19 Budget, we suggest the Government to take one step further to engage the wider public to participate in RE development in Hong Kong. While the Government has been actively working on installing solar panels and renewable energy systems in public buildings and facilities, as suggested by our participants, **renting the Government spaces** for solar panel installation could be considered to involve the public as the majority might not own a rooftop for solar panel installation and enjoy REFIT at present. Besides, the following buildings and facilities could be considered for solar installation in addition to the existing ones which have already installed solar panels:

Type	Buildings and facilities
<i>Government, Institution and Community (GIC) buildings</i>	<ul style="list-style-type: none"> • Government buildings • Public Schools • Recreational and amenity buildings • Public markets • Museums
<i>Public housing</i>	<ul style="list-style-type: none"> • Rooftops and public areas of public rental housing
<i>Public transport</i>	<ul style="list-style-type: none"> • Stations and stops of public transport • Buses
<i>Large-scale public facilities</i>	<ul style="list-style-type: none"> • Reservoirs • Public parks • Carparks • Selected areas in the airport • Immigration Control Points
<i>Other public facilities</i>	<ul style="list-style-type: none"> • Footbridges • Covered walkways • Street lightings
<i>Others</i>	<ul style="list-style-type: none"> • Slopes • Floating solar farm (solar panels on water surface such as lake or reservoir)

香港可再生能源討論工作坊

商議前的問卷

註：若你是來自公、商界的朋友，請你以個人身份回答以下問題。

1. 香港的發電量，有多少來自可再生能源？

請☒出合適選項。

- 20%
- 10%
- <1%
- 不知道/不願意答

2. 你同意以下的說法嗎？

請☒出合適選項。

	沒有意見	非常 不同意	不同意	中立	同意	非常 同意
(i) 可再生能源應該是香港發電能源組合的一部份。	<input type="checkbox"/>					

3. 你同意以下的說法嗎？「可再生能源應該是香港發電能源組合的一部份，因為……」

請☒出合適選項。

	沒有意見	非常 不同意	不同意	中立	同意	非常 同意
(i) 可再生能源可減少溫室氣體排放。	<input type="checkbox"/>					
(ii) 可再生能源可提高香港的能源自給率。	<input type="checkbox"/>					
(iii) 可再生能源可以創造有關清潔能源的就業機會。	<input type="checkbox"/>					

4. 你支持香港推行以下的可再生能源政策嗎？

請☒出合適選項。

(註：有關可再生能源政策的背景資料，請參閱簡介文件的第二部分。)

	沒有意見	非常反對	反對	中立	支持	非常支持
(i) 可再生能源上網電價補貼	<input type="checkbox"/>					
(ii) 可再生能源證書	<input type="checkbox"/>					
(iii) 淨計量電價(電力用戶可從電網使用的電量中、減去自己的可再生能源系統的發電量，從而計算自己從電力公司購買多少「淨」電量、需支付多少「淨」電費。)	<input type="checkbox"/>					

5. 你願意每月付多少錢購買可再生能源證書以支持香港發展可再生能源？

請☒出合適選項。

- 不超過港幣\$ 10
- 港幣\$ 11 – 20
- 港幣\$ 21 – 50
- 港幣\$ 51 – 100
- 港幣\$ 100 或以上
- 不知道/不願透露

6. 你願意每月多付多少電費來支持香港發展可再生能源？

請☒出合適選項。

	沒有意見	完全不可接受	不可接受	中立	可以接受	完全可以接受
(i) 不超過港幣\$ 10	<input type="checkbox"/>					
(ii) 港幣\$ 11 – 20	<input type="checkbox"/>					
(iii) 港幣\$ 21 – 50	<input type="checkbox"/>					
(iv) 港幣\$ 51 – 100	<input type="checkbox"/>					
(v) 港幣\$ 100 或以上	<input type="checkbox"/>					

7. 你住在香港哪一區？

8. 關於你居住的地區，你同意以下的說法嗎？

請☒出合適選項。

	沒有意見	非常不同意	不同意	中立	同意	非常同意
(i) 我居住的地區反映我是哪一類人。	<input type="checkbox"/>					
(ii) 我居住的地區是我喜歡流連的地方。	<input type="checkbox"/>					
(iii) 香港有其他地區的生活環境比我居住的地區更好。	<input type="checkbox"/>					

9. 你同意以下的說法嗎？

請☒出合適選項。

	沒有意見	非常不同意	不同意	中立	同意	非常同意
(i) 大自然的平衡極為脆弱且容易受人類活動擾亂。	<input type="checkbox"/>					
(ii) 地球好像是一艘空間及資源都有限的太空船。	<input type="checkbox"/>					
(iii) 植物與動物的存在，主要並不是為了供人類使用。	<input type="checkbox"/>					
(iv) 改變大自然環境以供人類使用，這做法很少會產生嚴重問題。	<input type="checkbox"/>					
(v) 中、美等國家沒有增長極限。	<input type="checkbox"/>					
(vi) 人類生來就有權利去管轄自然萬物。	<input type="checkbox"/>					

10. 你的職業

請☒出合適選項。

- 經理及行政級人員
- 專業及輔助專業人員
- 文書支援人員
- 服務工作及銷售人員
- 工藝及有關人員
- 機台及機器操作員及裝配員
- 非技術人員及初級職員
- 其他；請註明：(_____)

11. 每月個人收入

請☒出合適選項。

- 港幣\$ 14,999 或以下
- 港幣\$ 15,000 – 29,999
- 港幣\$ 30,000 – 44,999
- 港幣\$ 45,000 – 59,999
- 港幣\$ 60,000 或以上
- 不知道/不願透露

12. 你屬於哪持份者界別？

請☒出合適選項，可選取多於一個選項。

- 教育界別
- 私營界別
- 公營界別
- 公用事業
- 社會及非政府組織
- 退休人士/家務料理者
- 其他；請註明：(_____)
- 不知道/不願透露

13. 學歷

請☒出合適選項。

- 幼兒教育至中學或同等學歷
- 高中畢業或同等學歷
- 副學士/高級文憑/文憑/證書及同等學歷
- 學士學位及同等學歷
- 碩士或以上學歷
- 不知道/不願透露

14. 年齡

請☒出合適選項。

- 18 – 29 歲
- 30 – 39 歲
- 40 – 49 歲
- 50 – 59 歲
- 60 歲或以上
- 不知道/不願透露

15. 性別

請☒出合適選項。

- 男
- 女

16. 你的居所有天台嗎？

請☒出合適選項。

- 有（請回答第 17 題）
- 沒有（請回答第 18 題）

17. 你的居所全權擁有所屬天台嗎？

請☒出合適選項。

- 是
- 不是；我居所的天台與他人共用。
- 不是；我的居所是租用的。

18. 請提供你的姓名。

（註：你的個人資料只作研究用途。我們會將你的個人資料保密，在將來發表的所有研究報告上亦會以匿名處理你的個人資料。）

完成
謝謝你！

香港可再生能源討論工作坊

商議後的問卷

註：若你是來自公、商界的朋友，請你以個人身份回答以下問題。

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請☒出合適選項。

- 20%
- 10%
- <1%
- 不知道/不願意答

2. 你同意以下的說法嗎？

請☒出合適選項。

	沒有意見	非常不同意	不同意	中立	同意	非常同意
(i) 可再生能源應該是香港發電能源組合的一部分。	<input type="checkbox"/>					

3. 你同意以下的說法嗎？「可再生能源應該是香港發電能源組合的一部份，因為……」

請☒出合適選項。

	沒有意見	非常不同意	不同意	中立	同意	非常同意
(i) 可再生能源可減少溫室氣體排放。	<input type="checkbox"/>					
(ii) 可再生能源可提高香港的能源自給率。	<input type="checkbox"/>					
(iii) 可再生能源可以創造有關清潔能源的就業機會。	<input type="checkbox"/>					

4. 你支持香港推行以下的可再生能源政策嗎？

請☒出合適選項。

(註：有關可再生能源政策的背景資料，請參閱簡介文件的第二部分。)

	沒有意見	非常反對	反對	中立	支持	非常支持
(i) 可再生能源上網電價補貼	<input type="checkbox"/>					
(ii) 可再生能源證書	<input type="checkbox"/>					
(iii) 淨計量電價(電力用戶可從電網使用的電量中、減去自己的可再生能源系統的發電量，從而計算自己從電力公司購買多少「淨」電量、需支付多少「淨」電費。)	<input type="checkbox"/>					

5. 你願意每月付多少錢購買可再生能源證書以支持香港發展可再生能源？

請☒出合適選項。

- 不超過港幣\$ 10
- 港幣\$ 11 – 20
- 港幣\$ 21 – 50
- 港幣\$ 51 – 100
- 港幣\$ 100 或以上
- 不知道/不願透露

6. 你願意每月多付多少電費來支持香港發展可再生能源？

請☒出合適選項。

	沒有意見	完全不可接受	不可接受	中立	可以接受	完全可以接受
(i) 不超過港幣\$ 10	<input type="checkbox"/>					
(ii) 港幣\$ 11 – 20	<input type="checkbox"/>					
(iii) 港幣\$ 21 – 50	<input type="checkbox"/>					
(iv) 港幣\$ 51 – 100	<input type="checkbox"/>					
(v) 港幣\$ 100 或以上	<input type="checkbox"/>					

7. 你對這個工作坊有何看法？

請☒出合適選項。

	沒有 意見	根本 沒用					中立					非常 有用
	-	0	1	2	3	4	5	6	7	8	9	10
(i) 整個工作坊	<input type="checkbox"/>											
(ii) 小組討論	<input type="checkbox"/>											
(iii) 專家答問環節	<input type="checkbox"/>											
(iv) 全體及互動環節	<input type="checkbox"/>											

8. 你同意以下的說法嗎？

請☒出合適選項。

	沒有 意見	非常 不同意	不同意	中立	同意	非常 同意
(i) 小組主持人提供機會讓每個人都參加討論	<input type="checkbox"/>					
(ii) 小組所有成員都有差不多的參與程度	<input type="checkbox"/>					
(iii) 小組主持人有時試圖以自己的觀點影響小組成員	<input type="checkbox"/>					
(iv) 小組主持人確保一些反對的意見都會被考慮	<input type="checkbox"/>					
(v) 小組討論被少數成員所主導	<input type="checkbox"/>					
(vi) 小組成員都能尊重對方的意見	<input type="checkbox"/>					
(vii) 工作坊的簡介文件客觀地反映了不同的意見	<input type="checkbox"/>					
(viii) 專家答問環節解決了我們小組的討論問題	<input type="checkbox"/>					
(ix) 總的來說，這個過程有助於我理解整問題	<input type="checkbox"/>					

9. 你同意以下的說法嗎？

請☒出合適選項。

	沒有 意見	非常 不同意	不同意	中立	同意	非常 同意
(i) 從這個工作坊中，我獲得了一些新知識	<input type="checkbox"/>					
(ii) 在這個工作坊中，我能從一些新角度去 思考香港的可再生能源發展	<input type="checkbox"/>					
(iii) 參加完這工作坊後，我改變了我對香港 可再生能源上網電價補貼政策的一些觀 感/想法	<input type="checkbox"/>					
(iv) 參加完這工作坊後，我更有興趣自願購 買可再生能源證書	<input type="checkbox"/>					
(v) 參加完這工作坊後，我更有興趣探討在 家安裝太陽能光伏電板的可能性	<input type="checkbox"/>					

10. 參加今天這個工作坊前，你有閱讀過主辦單位所提供的「簡介文件」嗎？

請☒出合適選項。

- 根本沒有看過
- 只看了文件的一小部分，不到一半
- 看了文件約一半的內容
- 看了文件一半以上的內容，但沒有看完
- 已看了整份文件
- 不知道/不願透露

11. 請提供你的姓名。

(註：你的個人資料只作研究用途。我們會將你的個人資料保密，在將來發表的所有研究報告上亦會以匿名處理你的個人資料。)

完成
謝謝你！

Appendix 2. Selected quotations that can be found throughout the report

Quote 1

「頭先講到回報係主要關個裝置嘅成本，但其實除咗裝置成本之外，仲有其他既 opportunity value。咁當然依家係有兩條數，一條數就係淨裝個回報期係八至十年，我覺得都好似幾合理，但其實除咗裝置本身既價值之外，如果我願意去發電，我係會付出天台，個天台係一個價值黎嘛，或者我既花園，咁個價值其實就好似我地買樓建築面積，成個面積就講緊個嚟嘢實際幾多。除咗咁我仲要加一啲價值落去，我先攞到個回報，件事仲要睇得再闊少少，八至十年既實際回本我覺得都 look reasonable，但係我亦都睇唔好嘅人覺得咁你無著數一年賺成 11、12 個%，其實唔係咁計，應該係睇埋我仲要付出左啲乜嘢，然後再計埋 solar energy，如果計埋可能得 5%，但係如果我都肯，咁其實呢個都係一個。」

R15 // Group A Small Group Discussion 1

Quote 2

「……我作為一個公屋租戶，我只不過係一個租客，但業主係政府。咁如果我哋喺呢個計劃入面，作為一個公屋租戶，我哋電費要照樣交，但係我哋冇任何……即係如果真係話交叉補貼，我哋可能係受影響的一群。電費我哋每日都要計，我哋係消費者，我哋交既電費可能好少，但係因為呢個政策之下可能會受影響，從而交多咗電費去補貼一啲呢個政策既得益者。咁對我哋呢班公屋租戶嚟講，公唔公平呢？呢一個係一個好大既問題嚟。再者，從返香港嘅人口，個結構睇番，其實全香港人口，住喺公共屋邨嘅數目唔少，而呢個政策正正係會影響好大部分既一群人。」

R14 // Group C Small Group Discussion 1

Quote 3

「……永遠無公義架嘞，即係我都好抱歉呢個都有啲涉及經濟既問題……其實我確實係補貼緊你架嘞，即係我係幫手比錢，嗱呢個就翻返去核心啦，就係我地翻返去本身我地為咩囉，無忘初心啊嘛，大家為咩先，我哋為下一代，即係為咗環境咩嘛，即係問心嘅句，其實唔好講下一代，自己都受緊害啦，下年又唔知升幾多度架啦，因此我覺得其實有時啲嘢兩相權衡取其輕，有時可能真係唔係一定要下下都係咁利益著眼既，我哋搞清楚個問題核心係咩嘢，咁如果大家明白咗，講真我補得你幾多咩，香港既電費根本已經好平，咁所以我覺得亦未必係市民唔接受既……」

R22 // Group B Small Group Discussion 2

Quote 4

“...One other point is the RE certificates again in Schedule 5 are not owned by the owner of the Renewable Energy system. So if I put a system on my roof, I don't own the RE or the REC [Renewable energy certificates]. The utility owns the REC and the utility can sell them and use the profit, they have to use the profit to offset the cost of the scheme. In other words, it should reduce the increase in electricity prices with everybody would experience but nevertheless it is not mine to sell. So those two provisions are very unlike anything I have ever seen anywhere else in the world but they are logged in because the Scheme of Control has been agreed even though the Feed-in Tariff would haven't yet been finalized.”

Responses from Panel Discussion

Quote 5

「……無，其實我對證書有少少保留。不過我依家又諗唔到有更加好嘅辦法，因為始終做咗證書嗰個行政方面，或者執行方面都有好多都要睇，某方面係因為買證書嘅人因為佢自己，證書呢個措施一方面可以解決，當然亦都鼓勵咗另外一啲人，因為佢已經買咗證書，所以佢可以做啲對環境都無乜所謂，佢覺得已經付出咗 *social responsibility*。即係我自己對呢個仲有心結未完全解得開，不過我又無一個好好嘅建議。有時候就係覺得一個 *social responsibility*。」

R46 // Group A Small Group Discussion 1

Quote 6

「……但係呢個管理處呢，佢係反對係個屋頂加呢啲嘅，佢個權利都好大下，咁所以就算我哋話我哋想做，佢一句話唔得，我哋已經無得郁架喇。即係如果唔係就要同佢打官司，我哋係 100% 輸。」

R28 // Group A Small Group Discussion 1

Quote 7

「……而係話點先可以將呢一政策，呢個環保局既政策同兩電嗰個簽署咗既，一落實可以執行到，唔係一個口號，香港可能乜都有啦，求其啦，咁究竟係邊個去做呢？……政府唔可以留喺一個口號，淨係環保局獨一去撐話呢個政策。你其他部門跨部門都要去配合架，政府正所謂要拆除鬆綁，點樣可以令到新界咁多的屋可以做到……」

R23 // Group B Small Group Discussion 1

香港可再生能源討論工作坊

簡介文件



2017年11月4日(星期六), 上午9:00至下午5:30

香港浸會大學

主辦機構



協辦機構

GREENPEACE
綠色和平



350香港

目錄



章節	頁
1. 引言	2
1.1 歡迎辭及前言	2
1.2 工作坊程序	3
1.3 工作坊目的	4
1.4 與會人士	4
1.5 討論模式	4
1.6 專家簡介	5
2. 香港可再生能源上網電價補貼政策（上網電價）	6
2.1 上網電價的基本知識	6
2.2 香港上網電價的最新發展	7
2.3 香港現時的能源狀況	7
3. 香港上網電價的三大議題	8
3.1 上網電價—設計細節問題	9
3.2 上網電價的「交叉補貼」問題	12
3.3 安裝可再生能源系統涉及的審批程序、業權和物業管理的問題	14
4. 香港上網電價的三大議題 — 概覽表	16
附件	
參考資料	17
附錄一：美國住宅區安裝太陽能系統常見阻礙與日照權（Solar Access）的例子	21
附錄二：香港安裝可再生能源系統涉及的審批程序、業權和物業管理的問題	28
附錄三：韓國首爾的可再生能源政策	30

聲明：由於此簡介文件當中有未發表的資料，未經籌委會同意，請不要轉載或引用本簡介文件。有關本簡介文件之查詢，請與馬雅燕博士聯繫（電郵：daphnemah@hkbu.edu.hk 或致電 3411-7187）。如中英文版本有差異，以中文內容為準。

1. 引言



1.1 歡迎辭及前言

今天這場工作坊正因為有您們的參與，才變得重要。我們衷心感謝您們每一位，願意抽空來到這個工作坊，與我們一起商討可再生能源上網電價補貼政策（下稱上網電價）在香港未來的角色。

踏入二十一世紀，發展可再生能源如風能及太陽能漸漸成為全球化趨勢。以太陽能發電為例，近年隨着發電系統的生產成本大幅下降，在世界各地，太陽能發電已由大規模發電場普及至小型住戶式發電系統。為推動可持續發展，香港政府今年中公布，將於 2018 年十月開始推行上網電價。然而，作為首項主要可再生能源政策，上網電價能否有效落實仍存在很多變數，對香港的可持續發展影響深遠。在香港獨特地理及城市條件下，我們可如何推行上網電價，從而有效地促進香港太陽能發展呢？

此工作坊目的是邀請來自各個界別的朋友，分享您們對於香港即將推行的上網電價這一重要議題的寶貴意見。這次工作坊希望能集思廣益，為香港的可再生能源發展出一分力。

這工作坊的設計，是參考了美國史丹福大學開發的「商議式民意調查」方法。顧名思義，商議就是商量、議論。我們將透過小組討論、專家答問交流、大會互動等環節，讓您與其他參與者討論各自不同的意見，您亦可以向專家提問、或者邀請專家為您澄清一些重要的資料或觀點。究竟上網電價在香港有何角色、機遇和政策挑戰？這工作坊的目的，是提供一個讓大家共聚一堂的平台，讓您們及其他持份者就這些重要問題，進行討論和商議，經過深思熟慮後再作出自己的結論。

透過這工作坊，本港兩家電力公司及政府將會聆聽到您的寶貴意見，您的建議將可能影響日後相關政策的制定。

這份「簡介文件」是這次工作坊的關鍵組成部份，這文件為您們提供一個簡要的概覽，幫助您們了解上網電價在全球及本地的發展概況、發展過程中遇到的障礙及各地的應對措施等。請大家在出席前抽空細閱這簡介文件，在工作坊期間亦可隨時拿出來參考。

最後，我們衷心感謝在這個行業的專家們，為這份簡介文件的初稿給予意見。另外，我們也感謝綠色和平、350 香港、大學教育資助委員會優配研究金（項目編號：12602717）和香港浸會大學學術研究委員會的撥款支持。

再次感謝您抽空參與我們的工作坊！



籌備委員會敬啟

馬雅燕

香港浸會大學
亞洲能源研究中心主任
地理系助理教授

盧笛聲

香港浸會大學
地理系助理教授

楊凱珊

綠色和平
資深項目主任

古偉牧

350 香港
聯絡主任

1.2 工作坊程序



香港可再生能源討論工作坊

2017年11月4日（星期六；上午9時至下午5時半）
香港九龍塘浸會大學道十五號
香港浸會大學學術及行政大樓（AAB）7樓708室
語言：廣東話及英語
（大會將提供即時傳譯）

主辦機構

香港浸會大學亞洲能源研究中心

協辦機構

綠色和平東亞分部
350 香港

時間	活動	地點
上午 9:00-9:15	註冊	AAB 708 室外
上午 9:15-9:30	歡迎致辭及簡介 馬雅燕博士 亞洲能源研究中心主任及香港浸會大學地理系助理教授	AAB 708 室
上午 9:30-10:05	海外專家（一） Dr. Gilles Lepasant 法國國家科學研究中心城市地理組高級研究員（Unit Géographie-Cités, Centre National de la Recherche Scientifique (CNRS)） 題目：上網電價與可再生能源政策的興衰：德國的經驗	
上午 10:05-10:40	海外專家（二） Dr. Taedong Lee 韓國延世大學政治科學與國際研究系副教授 環境、能源與人力資源發展中心主任 題目：首爾模式的上網電價對香港政策發展的啟發	
上午 10:40-11:00	茶歇	AAB 7 樓
上午 11:00-下午 12:15	大會討論：外國經驗對香港的啟示 海外專家、本地主要持份者代表及與會者的互動環節	AAB 708 室
下午 12:15-1:15	午餐（由大會提供）	AAB1217 室
下午 1:15-2:30	小組討論（一）	AAB 708, 710, 711 室
下午 2:30-3:30	專家答問環節	AAB 708 室
下午 3:30-3:40	茶歇	AAB 7 樓
下午 3:40-4:40	小組討論（二）	AAB 708, 710, 711 室
下午 4:40-5:30	互動環節	AAB 708 室
	工作坊結束（體驗「香港太陽能地圖」）	

1.3 工作坊目的



透過今次工作坊，我們希望：

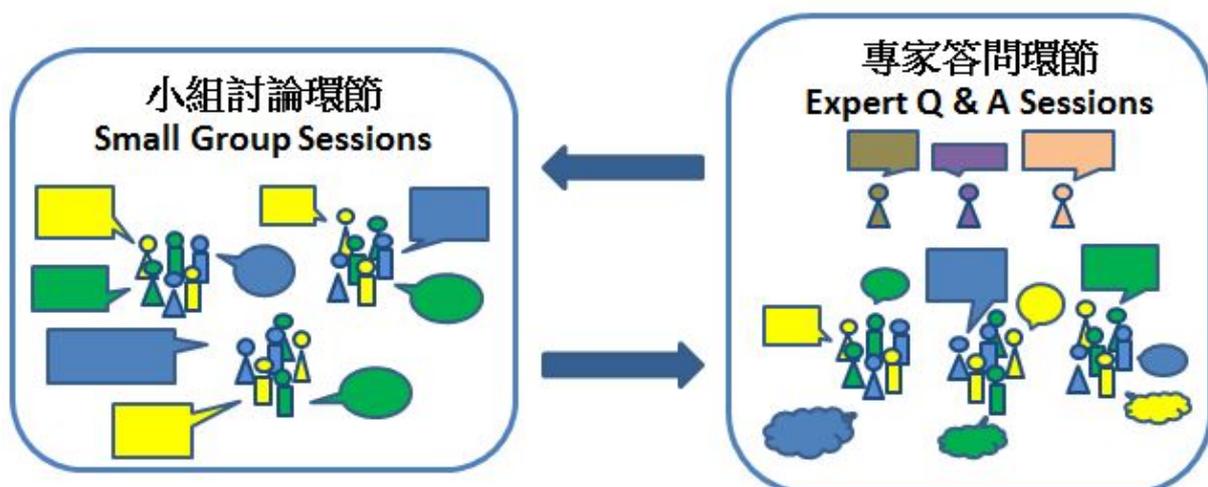
- 一) 通過小組討論、專家答問交流、大會互動等環節，提供一個讓大家共聚一堂的平台，讓各持份者進行討論和商議，促進市民在可再生能源政策的制訂過程中擔當積極角色；
- 二) 透過建立由公、私營界別、非政府組織和學術界的工作小組集思廣益，促進可再生能源政策持份者之間的溝通；
- 三) 預早了解上網電價這政策出台時，有何潛在問題，例如各政策持份者有何潛在衝突，從而為政府及大眾提供政策建議。

1.4 與會人士

與會者包括約 40 名居民、商界、社區機構、教育機構、非政府機構及電力公司等不同持分者的代表。與會者將分成三個小組進行討論，每一組均包括不同界別的持分者，希望能集思廣益。

1.5 討論模式

工作坊將採用一種有建設性又創新的模式（改良自美國史丹福大學開發的「協商式民意調查」方法）進行。到時，透過小組討論、專家答問、大會互動等環節，您將與其他參與者討論各自的不同意見，並可以向專家作出提問或請專家澄清重要議題。世界各地很多曾經參與過這類形式的工作坊的人士都覺得這種討論模式很有趣、亦很有價值，我們希望您也感到今次這個討論過程是有建設性的。



1.6 專家簡介



Dr. Gilles Lepasant

法國國家科學研究中心城市地理組高級研究員（Unit Géographie-Cités, Centre National de la Recherche Scientifique（CNRS））。

- 他的研究主要有三大範疇：
 - 歐洲的凝聚力與潔淨能源轉型下的能源政策；
 - 促進能源效益和可再生能源的城市和區域政策；及
 - 能源轉型下公用事業的發展策略。
- 此外，他在國際歐洲培訓中心（Centre international de formation européenne（CIFE））擔任全球能源轉型與管治碩士課程講師，並負責統籌數個由聯合國、歐洲委員會以及法國政府機構資助的研究項目。

Dr. Taedong Lee

韓國延世大學政治科學與國際研究系副教授，及環境、能源與人力資源發展中心主任。

- 他的研究領域包括：
 - 全球和地方環境政治與政策、
 - 非政府組織政治、
 - 國際政治經濟學和社會網路分析。
- 他最近出版的英文著作有 2015 年的 *Global Cities and Climate Change: Translocal Relations of Environmental Governance*。韓文著作則有 2017 的 *Village Community Politics* 和 *Debates in Environment and Energy Politics*。
- 他的學術文章在多個國際及韓國學術雜誌內刊登，包括 *Policy Sciences*、*Voluntas*、*Nonprofit and Voluntary Sector Quarterly*、*Review of Policy Research*、*Journal of Cleaner Production*、*Journal of Comparative Policy Analysis*、*Policy Studies Journal*、*Energy Policy* 及 *Global Environmental Politics* 等。

2. 香港可再生能源上網電價補貼政策（下稱上網電價）

2.1 上網電價的基本知識

什麼是可再生能源上網電價補貼政策？

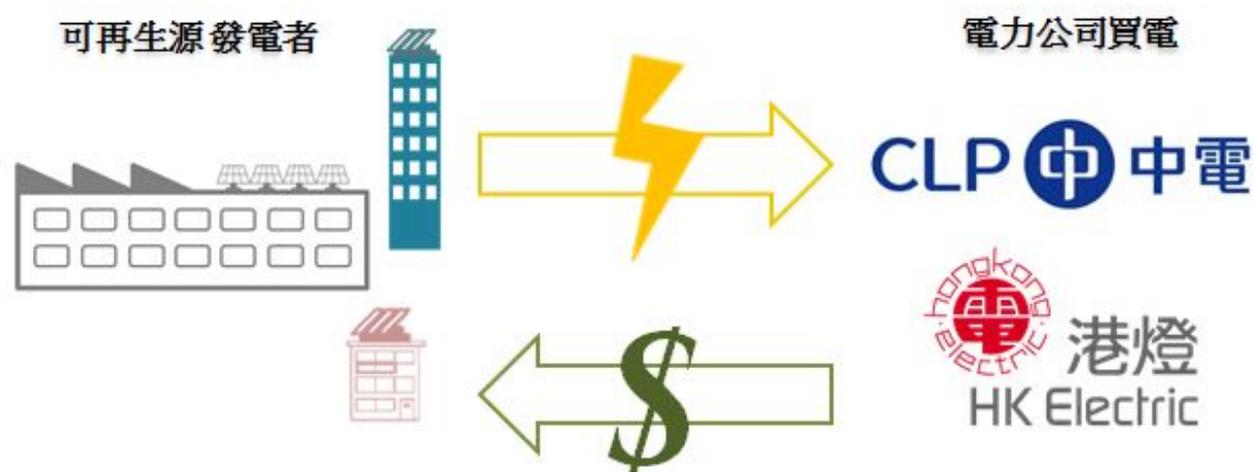
上網電價是一項補貼政策，一般國家及城市用以推動和促進可再生能源較大規模及普及發展。政府或電力公司通常與可再生能源發電者簽訂一份長期合同（例如 10 至 20 年），合約期間發電者每發 1 度電，就可獲得定額且高於正常電價的電價補貼¹。

上網電價通常具有以下元素：

- 一） 給予可再生能源發電者每度電固定而優惠的補貼；
- 二） 提供長期穩定的補貼；
- 三） 可再生能源發電系統可以連接到電網

與其他可再生能源政策（如可再生能源配額制（Renewable energy portfolio standards）、可再生能源證書等）相比，上網電價有以下優點：

- 一） 上網電價在多個國家均能有效地催生可再生能源的新項目，促進可再生能源市場和其國內行業的發展、鼓勵社會使用綠色能源來保護環境
- 二） 能降低投資可再生能源的門檻，因此可鼓勵中小企業、學校、甚至個人參與投資可再生能源項目
- 三） 行政手續相對較簡單、交易成本較低，融資較方便



¹ 可再生能源的上網電價可能固定並低於正常電價的水平。

2.2 香港上網電價的最新發展

根據政府已公布的資料：

- 一) 中華電力有限公司和香港電燈有限公司將分別於 2018 年 10 月和 2019 年 1 月推行上網電價。
- 二) 所有由可再生能源發電者生產的電力將進入電網。電力公司將根據發電量提供上網電價給可再生能源發電者。發電者的用電將以現有方式計算電費。
- 三) 兩家電力公司將出售可再生能源證書 (Renewable Energy Certificate; 下稱 REC) 以資助上網電價的補貼。REC 是一種能源商品，讓購入 REC 的用戶可對外宣稱已購買可再生能源。
- 四) REC 是自願性質。企業和個人可按個人意願決定是否購買 REC 及購買多少，以支持發展更多可再生能源。現時在外國及香港，已有企業為抵消本身的碳排放，而購買 REC。
- 五) 兩電將先以賣 REC 的收益支付上網電價的補貼費用，若 REC 的收益不足夠，兩電將調高電費中的燃料調整費，以支付上網電價的補貼費用。
- 六) 電力公司和政府將不時檢討上網電價和其他可再生能源發展機制。

2.3 香港現時的能源狀況

背景資料：

- 一) 本港現時約七成電力仍由燃燒化石燃料所得，可再生能源在發電燃料組合中僅佔約 0.1%。



圖一：政府計劃在 2015-2030 年間降低煤作為發電燃料的百分比
(資料來源：Environment Bureau, 2017)

- 二) 香港政府計劃用更多天然氣代替煤炭發電以減少碳排放。在 2015 年，煤佔香港所有發電燃料的 48%。政府計劃在 2020 年之前把該比例降至 25% (圖一)。
- 三) 香港的可再生能源規模有限。以太陽能發電為例，截至 2016 年，太陽能光伏的安裝容量不超過 5 兆瓦 (Megawatt; MW)，約佔全港發電量的 0.04%。

3. 香港上網電價的三大議題

3.1 上網電價—設計細節問題

3.2 上網電價的「交叉補貼」問題

3.3 安裝可再生能源系統涉及的審批程序、業權和物業管理的問題





3.1 上網電價—設計細節問題

這議題為何重要？

上網電價政策有以下成敗關鍵：

- (一) 能否縮短可再生能源的投資回報期及
- (二) 能否適時及有效地調整上網電價補貼。

根據外國及本地經驗：

- 投資回報期過長會窒礙可再生能源的發展，提供年期較長及補貼金額較高的上網電價可有效縮短可再生能源回報期。以香港的住宅屋頂太陽能發電系統為例，現時的投資回報期大約是 35 年²，而隨著生產太陽能光伏電板的成本下降，有個別的住宅太陽能項目的回報期已降至大約 10 年。
- 假設香港下年實行上網電價並將補貼訂為每度電 2 港元，住宅天台太陽能發電系統的投資回報期可能會從 35 年降至 18 年。
- 國際及本地研究均顯示，縮短可再生能源投資回報期可有效提升市民安裝太陽能光伏電板的意欲。在國外一些發展太陽能較發達的國家，投資回報期一般都在 10 年內。

表 1：透過上網電價來縮短投資回報期的例子

地區	政策簡介	預計投資回報期
南韓首爾 ³	<ul style="list-style-type: none">● 首爾的上網電價：全市提供長達 5 年每度電 100 韓圓（約港幣 0.68 元）的上網電價（根據 2015 年的價格）● 推廣上網電價至非住宅樓宇屋頂，包括濾水廠及地鐵車廠等● 同時推行淨計量電價⁴、可再生能源證書及可再生能源債券	8 年
日本東京 ⁵	<ul style="list-style-type: none">● 自 2012 年起，東京推行每度電 42 日元（約港幣 2.93 元）的上網電價及淨計量電價。相對只使用淨計量電價，上網電價使投資回報期由 40.8 年縮短至大約 8 年。該補貼亦成功吸引大批住宅用戶安裝太	7.7 至 8.05 年

² 估計在一間標準村屋（約 700 平方尺）的天台，可以安裝 6 塊太陽能板（太陽能板普遍尺吋為 1.65 平方米），以現時市場價格估算，安裝總成本為港幣 55,000 元。該太陽能系統年產電量為 1,560 度（每天產電 4.27 度），假設以每度電費港幣 1 元計算，每年可節省 1,560 元，回本期約為 35 年。

³ 有關南韓可再生能源政策的其他資料，請參閱附件三。

⁴ 淨計量電價機制(net-metering)計算用戶的「淨用電量」來計算電費。住戶從電網使用的電量將減去從太陽能發電系統提供的電量來計算該住戶的淨計量電價。

⁵ Muhammad-Sukki *et al.* (2014)

太陽能發電系統⁶。

- 同時推行太陽能電板租借服務、可再生能源證書及可再生能源債券

澳洲⁷

- 澳洲在 2009 年提供每度電 0.4 至 0.6 澳幣（約港幣 2.46 至 3.69 港元）的高額上網電價⁸。 3 至 4 年（2011-2012）
- 到 2013 年，上網電價減至每度電 0.08 澳幣（約港幣 0.49 港元）。有研究指出，減少補貼導致太陽能電板安裝率減少 17%。如果完全撤銷補貼，太陽能電板安裝率將減少 33%。 5 至 6 年（2014-2015）
- 同時推行可再生能源證書及可再生能源目標

然而，上網電價需不時調整來反映最新的可再生能源市場價格、成本及覆蓋率，否則，有可能引起以下兩大問題：

- 如果有很多可再生能源的投資者或住戶在短時間內投資及安裝可再生能源發電系統，可再生能源的發電量將突然大幅提高，並引致電價在短時間內大幅上升。
- 當太陽能光伏電板價格大幅下降、而上網電價沒有及時調低的話，大型投資者便可趁機獲取暴利。

表 2：實施上網電價調整機制的例子

上網電價一般透過實施遞減率與設定發電容量上限來調整⁹：

地區	政策簡介
德國 (例子一)	• 德國使用按年遞減率來調整上網電價。該計劃為各種可再生能源技術預先設定按年遞減率。由於太陽能電板價格經常下調，使用太陽能技術的按年遞減率亦較其他技術高。
德國 (例子二)	• 德國在 2008 年推行新的遞減率響應機制。該計劃為每種太陽能發電系統（如地面型及住宅屋頂型）設定標準按年遞減率，下一年度的遞減率將根據本年度的可再生能源安裝發電容量來調整。
美國加州	• 美國加州使用高透明度計量梯級式調整機制。參加者可上網查詢每日更新的可再生能源發電容量。當計劃達到一定容量時，上網電價便會根據預先設定的遞減率減少。
西班牙	• 西班牙分別在 2009 至 2010 年及 2011 至 2012 年實施 500 兆瓦及 400 兆瓦的每年可再生能源發電容量上限以防市場過熱。同時，地面型及屋頂型太陽能發電系統分別不可超過上網電價 10 兆瓦及 2 兆瓦的上限。

⁶ 有關日本電價補貼的發展，請參閱 http://www.pida.org.tw/optolink/optolink_pdf/1011110203.pdf。

⁷ Burt & Dargusch (2015)

⁸ 不同州份及地區因應情況決定是否實行上網電價、補貼價格、覆蓋面、期限及設定系統上限為 5 或 10 千瓦。

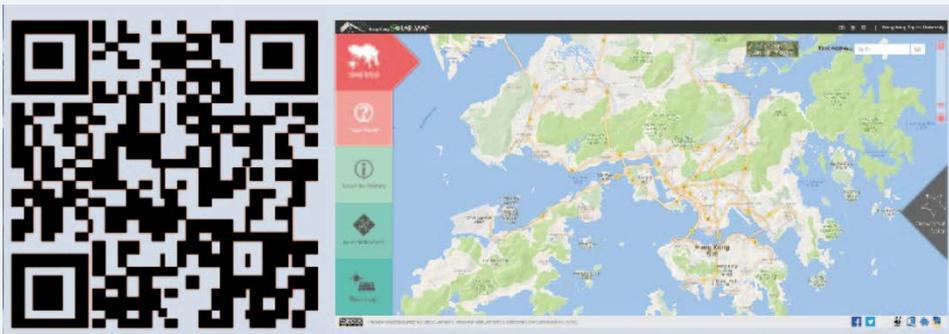
⁹ Kreycik, Couture, & Cory (2011) and Speer (2011)

香港有何機遇？

- 如果可以更快回本，香港可能有更多企業、家庭有更大意欲安裝太陽能發電系統或其他可再生能源發電系統。
- 香港兩家電力公司及政府可以不時檢討上網電價及其他可再生能源方案，並與大眾市民對上網電價、調整機制及其他可再生能源方案取得共識，我們便有機會防止小部份人濫用補貼及謀獲暴利。
- 香港可實施有效的調整機制來保護弱勢住戶及確保可再生能源機制的公平性。

香港太陽能地圖

您可使用由香港浸會大學、世界自然基金會(香港)和綠色和平合作研發的太陽能地圖來計算投資可再生能源的回報。該地圖可計算：您的住所或物業可以安裝多少太陽能發電板、系統每年能發多少電、成本、能節省多少電費及安裝太陽能發電系統的投資回報期等問題。您也可探索不同上網電價方案對投資回報期的影響：<http://digital.lib.hkbu.edu.hk/solarmap/>



3.2 上網電價的「交叉補貼」問題



這議題為何重要？

上網電價涉及的補貼，一般是由所有電力用戶(例如透過附加費)又或者納稅人(政府動用公共財政)來共同承擔。「交叉補貼」是指一般的電力用戶(即沒有安裝太陽能發電系統的電力用戶)未能享受上網電價的補貼，但同時有可能要分擔上網電價的補貼費用，變相要付較高的電費來津貼其他人用太陽能發電。由於有能力安裝太陽能系統的住戶一般較為富有，上網電價有可能引致收入較低的住戶補貼富有住戶的情況。上網電價有可能令電費上升，從而特別對低收入家庭構成經濟壓力。

海外經驗

- **政府可制定補助政策，照顧低收入家庭及有需要人士**
澳洲新南威爾士州政府有以下做法：
 - (1) 低收入人士可獲豁免，毋須分擔上網電價的新增成本
 - (2) 有需要的家庭可獲電費回贈
 - (3) 政府撥款成立專項基金，來支付上網電價所需的費用
- **引入新的電價制度，太陽能發的住宅用戶和普通的住宅用戶(家中沒有可再生能源發電設備的住宅)所支付的電價將有分別，以更能反映發電的真實成本**
在澳洲昆士蘭，在用電的高峰時段(例如傍晚)，由於用電需求較高、電網所承受的負荷壓力亦較高，電力公司會向可再生能源的提供者，收取較高的「併網費用 (network charges)」；相反，在用電的非高峰時段(例如深夜、清晨)，「併網費用」便會相應較低。因此，太陽能發電的住宅若在用電高峰時段賣電給電網公司，與普通住宅用戶相比，便需要支付更高的「併網費用」。
- **讓自願者多付：有興趣支持可再生能源的人士可透過認購可再生能源證書，自願以較高的價錢購買可再生能源**
在美國維珍尼亞州，透過當地的可再生能源證書系統，電力公司以高於一般電價的價錢，向太陽能發電用戶購入太陽能電力，電力公司再將可再生能源證書出售給有興趣認購的人士或企業。
- **預設可再生能源的發展上限，從而控制電價上升的壓力**
美國佛羅里達州自 2009 年推行上網電價，電力公司訂立了每年新的可再生能源裝機容量上限為 4MW，從而控制電價上升的幅度為每年 1%。

香港有何機遇？

- 採用不同方式，例如電價回贈，保障低收入家庭、或有需要人士
- 探討改良電價機制、自願性參與上網電價等的可能性
- 把握政府推出上網電價的時機，加強環保教育的工作，讓公眾認同保護環境人人有責
- 「交叉補貼」問題有多嚴重將很大程度視乎香港可再生能源的發展有多快。以香港兩間電力

公司去年的賣電收入港幣 520 億計算（Census and Statistics Department, 2017），假設上網電價的補貼金額設下電費收入 1% 為上限，即去年便可撥出 5 億 2 千萬元作為上網電價補貼金額。若這筆補貼額全數由電力用戶分攤（假設沒企業或人士自願認購可再生能源證書），即每個用戶將每年多付約港幣 168。而這筆補助金額，將足夠為約 16 萬 7 千間太陽能發電用戶（共約 260MW 發電容量，即全港發電容量 12650 MW 的約 2%）提供每度電港幣 2 元的上網電價。可再生能源佔全港發電容量由現時 0.04% 要達到 2% 可能需要一定時間，這段時間內各方可集思廣益，討論如何用公平的方式推動上網電價。





這議題為何重要？

上網電價可以有效縮短可再生能源的回報期，不過，除了回報期之外，可再生能源的投資者亦很多其他問題，包括：

(i) 項目涉及的審批程序較繁複、成本因而上升（主要為公、私營界別遇到的障礙）：

在香港，申請安裝可再生能源發電裝置和進行電網連接需經過審批。以在建築物天台安裝太陽能發電系統為例，便需要完成審批，以確保天台及框架的結構能力、以及其他方面的安全性。有太陽能光伏供應商指出，不同類型的建築物所涉及安裝工程費用、安裝時間、行政及審批程序不同：

- 一般來說，住宅天台¹⁰的太陽能系統所需的工程安裝及審批時間較短、約一星期即可完成；所需的工程費用大約由一萬至二萬元；
- 商業樓宇、學校及政府部門安裝太陽能發電系統涉及的安裝工程費用較高、安裝時間較長、行政及審批程序亦較繁複；安裝成本是住宅太陽能系統的 5 倍或以上，工程有可能需要超過一年時間才完成。

(ii) 業主的限制（主要為學校遇到的障礙）：

大部分中、小學的土地及物業屬政府部門擁有。因此，中、小學需先得到作為業主的政府部門同意，才可安裝太陽能系統。此外，學校申請安裝太陽能系統需同樣經過上述的行政及審批程序，增加了安裝太陽能系統的成本。

(iii) 物業管理機構的限制（主要為住宅遇到的障礙）：

住宅物業安裝太陽能系統安裝可能會受物業管理機構限制。一些大型低密度、間格較劃一的社區屋苑，如錦綉花園、康樂園，和匡湖居等都有安裝太陽能系統的潛力。然而，據本研究團隊去年收集的意見顯示，安裝太陽能系統有可能牽涉違規建築及建築安全等問題，導致有關的物業管理公司、業主立案法團並不支持住戶在天台安裝太陽能板，令有興趣的住戶未能成功安裝系統。除此之外，這類業主亦要面對其他問題，包括：日照及樓宇之間的遮蔽、保險等問題。

海外經驗

A. 簡化項目的審批程序、降低成本、縮短時間：

(i) **波特蘭（美國俄勒岡州）：**有社區設立統一招標、集體採購計劃以減低交易和管理成本。這項計劃由波特蘭西南部的非政府機構 Energy Trust（能源信託）帶頭，並得到其他非政府機構及社區義工協助。Energy Trust 會協調招標流程及協助住戶安裝太陽能系統。計劃會為住戶統一招標，中標承包商將以單一價格為所有參加住戶提供安裝服務。此商業模式有助降低交易成本和增加市場訊息透明度。

(ii) **澳門：**政府網站提供方便參閱的資料，例如安裝說明及法律與行政要求：

<http://www.gdse.gov.mo/solar/>

¹⁰ 泛指一般七百平方呎村屋。

(iii) 澳門：政府網站提供太陽能設備供應商的聯繫方式：
http://www.gdse.gov.mo/public/chn/ec_vendor/page2.html

B. 透過立法、確保並管制日照權（Solar Access）及太陽能地役權（Solar Easements）：

(iv) 美國部分地區：管制日照權（Solar Access）的法律：

- 物業管理機構可對可再生能源發電系統的安裝過程和位置提出要求。若有物業管理機構對有關系統作出不合理的規限，住戶便可引用該法例來保障安裝有關系統的權益。

(v) 美國部分地區：太陽能地役權（Solar Easements）：

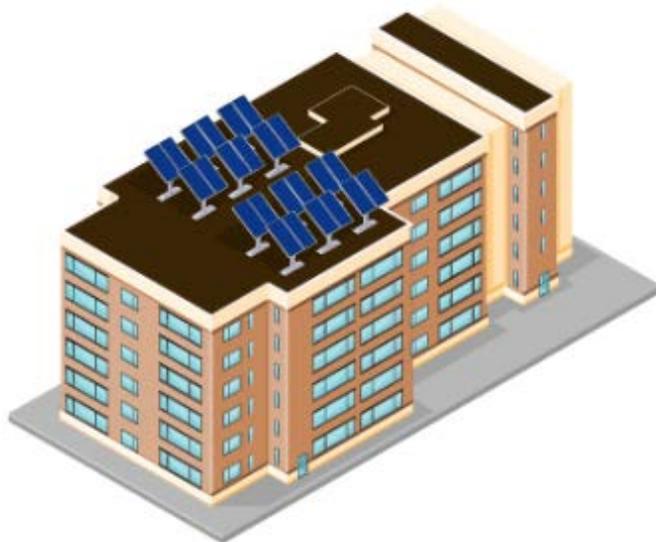
- 該法律確保太陽能系統能繼續接收陽光照射，日照不被相鄰屋宇所遮蔽。
- 有些地區的日照權法律提供自動的權益，而有些地區則提供機制允許合同雙方自願達成有關日照權的約定。
- 日照權的法律可授權訂立分區規則來禁止對於接收太陽能的不合理限制。

若想參閱有關的美國案例，請見附錄 1（Appendix 1）。

香港有何機遇？

- 香港政府可採用明確有效的可再生能源政策並提供明確的市場信號和經濟激勵，推動商業創新和鼓勵社區與商業機構的合作。
- 除了考慮立法之外，政府可先採取柔性的方法，制定在社區發展太陽能的指引，就日照權及太陽能地役權等問題作出建議。
- 大型發展商、港鐵、機管局、房委會及房協等組織對於香港可再生能源的發展有一定的影響力，政府、兩電及環保團體等可透過公眾教育，鼓勵公、私營界別共同參與發展可再生能源、以承擔社會責任。
- 針對物業管理組織及業主立案法團，政府、兩電及環保團體等可透過公眾教育，教育物業管理組織關於可再生能源系統的優點及對物業的益處。

若想參閱有關香港情況的更多資料，請見附錄 2（Appendix 2）。





4. 香港上網電價的三大議題一概覽表

議題	重要性	實踐案例
上網電價—設計細節問題	<p>投資回報期：</p> <ul style="list-style-type: none">縮短投資回報期可提高可再生能源系統的安裝率 <p>調整機制：</p> <ul style="list-style-type: none">避免上網電價補貼及整體電價突然大幅上升減低可再生能源的投機活動及有人借機獲得暴利	<p>投資回報期的例子：</p> <ul style="list-style-type: none">韓國首爾：全市提供長達 5 年每度電 100 韓圓（約港幣 0.68 元）的上網電價補貼日本東京：自 2012 年起，推行淨計量電價及每度電 42 日元（約港幣 2.93 元）的上網電價補貼澳洲：在 2009 年提供每度電 0.4 至 0.6 澳幣（約港幣 2.46 至 3.69 港元）的高額上網電價補貼 <p>調整機制的例子：</p> <ul style="list-style-type: none">設定遞減率響應機制以回應可再生能源發電容量的升幅當可再生能源達到一定發電容量，上網電價補貼便相應下調設定每年可再生能源發電容量上限
上網電價的「交叉補貼」問題	<ul style="list-style-type: none">上網電價「交叉補貼」可能引致「劫貧濟富」現象整體電價上升可能令低下階層住戶百上加斤單一的上網電價及補貼資源分配失衡均可能引致交叉補貼	<ul style="list-style-type: none">制定補助政策以保護弱勢社群向太陽能發電住戶徵收併網費用來反映真實成本透過出售可再生能源證書以補貼上網電價支出預設可再生能源發展上限
安裝可再生能源系統涉及的審批程序、業權和物業管理的問題	<ul style="list-style-type: none">安裝可再生能源發電系統涉及複雜的審批程序有意在住宅安裝可再生能源發電系統的人士可能受到物業管理機構的限制而不能順利安裝	<ul style="list-style-type: none">簡化行政程序：設立統一招標、集體採購計劃等的新型商業模式，以減低交易和管理成本，並增加市場訊息透明度太陽能權益的教育：提供並宣傳關於日照權及太陽能地役權等可再生能源權益的指引，並教育有關規定的制定及執行者，讓他們對於可再生能源發電系統的優點有進一步的瞭解



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Appendix 1: Case examples of legislations in the U.S. that regulate excessive intervention from homeowners associations

(附錄一：美國住宅區安裝太陽能系統常見阻礙與日照權的例子)



How legislations in the U.S. regulate excessive intervention from home owners associations, protect solar rights and facilitate installation of solar energy systems in residential areas:

(i) Major barriers in the U.S.: Covenants, Conditions, and Restrictions (“CC&R”):

- **Governing documents:** CC&Rs are the governing documents that dictate how an HOA operates and what rules the owners, their tenants, and guests must obey.
- **Three distinct legal mechanisms:** (1) covenants; (2) conditions; and (3) restrictions. (EPIC, 2014)
 - **Covenants**, also called “restrictive covenants,” are enforceable promises that assign either a benefit or a burden to a property. Covenants are usually part of the property title or deed and therefore apply to subsequent property owners.
 - **Conditions** relate to the circumstances that may end an ownership interest (e.g., right of first refusal, dissolution of the subdivision).
 - **Restrictions** refer to legal restrictions placed on the ownership or use of the property, such as easements or liens. In common interest developments, restrictive covenants typically dictate the manner in which solar energy systems can be installed.
- **Covenants run with the land:** Restrictive covenants are mutual agreements contained in deeds to real property. They are typically part of planned communities and subdivisions where the developer has stipulated the architectural form and general scheme of construction in the community. These restrictions are not personal in nature but rather are considered to “run with the land.” That is, they are effective against all subsequent owners of the affected property (Solar ABCS, 2008).
- **Common barriers in the U.S. hindering installation of solar systems in residential areas** (DOE, 2000):
 - Covenants requiring prior approval of architectural committee
 - Explicit restrictions on the placement of solar equipment
 - Setback requirements
 - Height restrictions
 - Restrictions on secondary buildings and structures
 - Restrictions concerning vegetation
 - Requirements that utilities be screened
 - Restrictions on the placement of improvements
 - Specifications regarding roofing materials
 - Regulations affecting piping
 - Restrictions pertaining to architectural style

(ii) Solar access laws (Solar ABCS, 2008), (NCCETC, 2017):

- **Override unreasonable contractual restrictions:** If the law in that state says home owners’

associations (“HOAs”) cannot cause “unreasonable restrictions” over the installation of solar panels, and then the law would override any contractual right the HOA may have in imposing those restrictions.

- **Common provisions in solar access law provisions directed at CC&Rs** (Rosenthal, 2013):
 - Only “reasonable restrictions” allowed; and
 - Restrictions cannot “effectively prohibit” or “unduly restrict” a homeowner’s ability to install a solar device.¹¹
- **Examples of solar access law provisions:**

Colorado	Cannot effectively prohibit or restrict installation or use of renewable energy generation device: “[a] covenant, restriction, or condition contained in any deed, contract, security instrument, or other instrument . . . that <u>effectively prohibits or restricts</u> the installation or use of a renewable energy generation device is <u>void and unenforceable.</u> ” (Rosenthal, 2013)
Wisconsin	Cannot prevent or unduly restrict the construction and operation of solar energy systems: “[a]ll restrictions on platted land that <u>prevent or unduly restrict</u> the construction and operation of solar energy systems . . . are <u>void.</u> ” (Rosenthal, 2013)
California	Cannot restrict solar energy system installations through unreasonable CC&Rs; cannot impose undue discrimination when scrutinizing applications: limits the ability of HOAs to <u>restrict</u> solar energy system installations through <u>unreasonable CC&Rs</u> and prohibits <u>undue discrimination</u> in processes used to consider and approve solar energy installations. (NCCETC, 2017)
Massachusetts	Cannot forbid or unreasonably restrict the installation or use of a solar energy systems: prohibits restrictions on solar devices, voiding "any provision in an instrument relative to the ownership or use of real property which purports to <u>forbid or unreasonably restrict the installation or use of a solar energy system</u> ... or the building of structures that facilitate the collection of solar energy." (NCCETC, 2017)
Arizona	Cannot effectively prohibit the installation or use of solar-energy devices; can adopt reasonable rules regarding placement of a solar device under certain conditions: HOAs <u>may not effectively prohibit the installation or use of solar-energy devices</u> (panels and associated devices). An association may, however, adopt reasonable rules regarding the placement of a solar device <u>if those rules do not prevent the installation of the device, impair the functioning of the device, restrict its use, or adversely affect the cost or efficiency of the device.</u> The bill also grants reasonable attorney fees to any party who substantially prevails in litigation against an association's board of directors. (NCCETC, 2017)

- **What kind of restrictions are still allowed under the solar access laws? What kind of restrictions are not allowed?**
 - **California:** Allows provisions that impose “reasonable restrictions” (EPIC, 2014; DOE, 2000)

Rule ¹²	“Reasonable restrictions” are those that: <ul style="list-style-type: none"> • <u>do not “significantly” (exceeding 20%) increase the cost of the system or decrease its efficiency or performance; OR</u>
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¹¹ In different states, the language of these statutes vary. However, most of them provide that community associations may continue to promulgate and enforce “reasonable” regulations pertaining to solar energy systems. Specifically, eighteen of the twenty-one state statutes that address CC&Rs allow for either: (1) “reasonable restrictions,” or (2) restrictions that either do not “effectively prohibit” or “unduly restrict” a homeowner’s ability to install a solar device. (Rosenthal, 2013)

¹² California Civil Code § 714

	<ul style="list-style-type: none"> allow “an alternative system of comparable cost, efficiency, and energy conservation benefits.”
Case 1	<p><i>Palos Verdes Home Ass’n v. Rodman</i>¹³ (1986):</p> <p>The court upheld the HOA’s denial of application for installation of solar panels for failing to comply with its solar unit guidelines involving aesthetic considerations, and found that the guidelines are considered “reasonable restrictions”.</p> <p>Facts:</p> <ul style="list-style-type: none"> The HOA argued that its guidelines do not prohibit all solar units but are formulated to promote the installation of solar units which are comparable in costs and aesthetically acceptable. Expert evidence from a mechanical engineer concluded that the <u>solar units permitted by the HOA guidelines were comparable to the type installed by the home owner in performance and costs.</u> (His study included a comparison of the costs of various solar systems, including appellant's; their positive and/or negative aspects; capacity; weight; insulation; tank temperature design; efficiency; output and warranties. He compared 26 systems installed on the Palos Verdes Peninsula with appellant's one.) Based on the expert evidence given and the fact that home owner’s own witness agreed that the various solar systems discussed by the engineer were comparable, the court agreed that the HOA’s requirements were reasonable.
Case 2	<p><i>Tesoro Del Valle Master Homeowners Association v. Griffin</i>¹⁴ (2011):</p> <p>It was reasonable for the HOA to deny the application of property owners to install solar panels on a slope adjacent to their residence based on aesthetic and other considerations:</p> <ul style="list-style-type: none"> Nothing in Civil Code section 714 prohibits a HOA from considering the aesthetic impacts of solar energy systems. In fact, the HOA could consider the aesthetic impact of the solar panels when making a decision about the home owners’ application. The Court of Appeal upheld the order of the trial court directing the home owners’ to remove the solar panels from the slope and return the slope to its original condition. <p>Facts:</p> <ul style="list-style-type: none"> The home owners wanted to install a solar energy system on a slope adjacent to their property. The HOA's covenants, CC&Rs provide that homeowners must obtain approval before making improvements on their property, including any changes to the slope areas that are near the properties in the development. The HOA's Design Guidelines provide that pursuant to Civil Code section 714, the HOA can place reasonable restrictions on the installation of solar energy systems. The home owners decided to install 36 solar panels on their roof and 22 panels on the slope and signed a contract for installation prior to receiving approval from the HOA. The HOA eventually denied the home owners’ application to install solar panels. The denial letter suggested that the home owners consider placing the panels on the roof of the casita that is adjacent to their home. The HOA expressed concern about the home owners placing panels on the slope because it is located at the entry to the neighborhood and the panels would be within the line of sight of adjacent homes. Also, the CC&Rs prohibit the alteration or removal of landscaping on the slope due to the impact on drainage. The home owners began construction despite the HOA Board's denial of their

¹³ *Palos Verdes Home Ass’n v. Rodman*, 182 Cal. App. 3d 324 (1986).

¹⁴ *Tesoro Del Valle Master Homeowners Ass’n. v. Griffin*, 133 Cal. Rptr. 3d 167 (2011).

	<p>application. The HOA directed the home owners to return the slope to its original condition.</p> <ul style="list-style-type: none"> • The court found substantial evidence supporting the jury’s finding based on expert testimony showing that a comparable alternative system could be installed within the home owners’ yard for a lower cost and with only a 14% reduction in output. • Finally, the court stated that the HOA Board was not responsible for identifying an alternative site for building the photovoltaic system upon denial of the home owners’ application to build on the hillside. • Therefore, the court ordered the home owners to remove the hillside solar energy system.
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- **Arizona: bars HOAs from “effectively prohibiting” the installation or use of a solar energy device, although “reasonable” restrictions on the placement of solar energy devices are allowed** (EPIC, 2014; DOE, 2000; Energy Policy Innovation Council [EPIC], 2013)

Rule	<p>“effectively prohibiting”¹⁵ (introduced in 1979):</p> <ul style="list-style-type: none"> • “Any covenant, restriction or condition” contained in an HOA agreement which <u>“effectively prohibits the installation or use of a solar energy device . . . is void and unenforceable.”</u> • The meaning of “effectively prohibiting” has been interpreted further by the Arizona Appellate Court in a 2003 case (refer to <i>Garden Lakes Community Ass’n v. Madigan</i> below). <p>“reasonable” restrictions¹⁶ (introduced in 2007):</p> <ul style="list-style-type: none"> • do not prevent the installation of the device, impair the functioning of the device, restrict its use, or “adversely affect” cost and efficiency. • This requirement had been applied in a 2012 case (refer to <i>Fox Creek Community Association v. Carson</i> below).
Case 1	<p><i>Garden Lakes Community Ass’n v. Madigan</i>¹⁷ (2003) (EPIC, 2014):</p> <p>The court considered these key factors when deciding whether the HOA requirements “effectively prohibited” the installation:</p> <ol style="list-style-type: none"> 1. <u>Content and language</u> of the restrictions or guidelines 2. <u>Conduct of the HOA</u> in interpreting and applying the restrictions 3. The <u>existence of feasible alternatives</u> 4. <u>Feasibility & cost</u> of alternative designs 5. Whether HOA policy is <u>wholly responsible</u> for <u>precluding</u> installation 6. <u>Location, type, and value of the homes</u> in the community 7. Whether restrictions impose too great a <u>cost in relation to what typical homeowners in the community are willing to spend.</u> <p>Facts:</p> <ul style="list-style-type: none"> (ii) A home owner challenged his HOA’s prohibition on the installation of a rooftop solar water heater. (iii) The HOA’s policy would have required a \$5,000 USD addition to the home owner’s house in order to comply with the policy. (iv) The court held that the policy “effectively prohibited” the installation of a solar water heating system and was therefore void and unenforceable.
Case 2	<p><i>Fox Creek Community Association v. Carson</i>¹⁸ (2012): addressed the issue of a reasonable restriction</p>

¹⁵ Arizona Revised Statutes § 33-439 (Arizona’s Solar Rights Law)

¹⁶ Arizona Revised Statutes § 33-1816

¹⁷ *Garden Lakes Community Ass’n v. Madigan*, 204 Ariz. 238 (Ct. App. 2003)

	<p>The HOA’s requirement for the home owner to seek its approval before installing his solar energy device, and its requirement for the solar energy devices be screened or concealed by a wall or moved to the backyard were considered reasonable.</p> <p>Facts:</p> <ul style="list-style-type: none"> • A HOA sued a home owner for failure to obtain approval from the HOA before constructing his solar energy device (“SED”). • The home owner was required by CC&Rs to acquire the approval of his HOA before building a solar energy system. The CC&Rs required solar devices be screened or concealed to the extent the Association reasonably deems appropriate. • The home owner submitted an application to the HOA and proposed to screen the device with trees, he then began construction to install the SED outside the wall surrounding his home. • The HOA denied his application, but stated that the solar installation would be approved if a six-foot wall is constructed around the device or if the device was moved to the fenced backyard. • The court held that: <ul style="list-style-type: none"> ○ The HOA’s requirements were reasonable restrictions, as they did not prohibit the installation of the solar device ○ the home owner could not prove the HOA restrictions to be unreasonable¹⁹, and ○ the home owner should have reapplied for approval from the HOA. <p>(The court did not comment on whether the standard of “reasonable” restriction introduced in 2007 is more stringent than the standard of “effectively prohibiting” introduced in 1979. However, it does seem that the addition of the 2007 rule would offer more protection for those intending to install SEDs. (EPIC, 2013))</p>
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(iii) Solar easements (14 states in the U.S. have these) (NCCETC, 2017; (EPIC, 2014):

- **Solar easements can ensure access to unobstructed sunlight for a solar energy system by preventing the landowners of adjacent lands from obstructing the access to sunlight.**
- Examples of solar easements:

California	<p>Allows a solar energy system owner access to sunlight across an adjacent parcel.²⁰ (EPIC, 2014)</p> <p>(i) In 1978, as part of the Solar Rights Act, California added the right to receive sunlight to its list of statutorily recognized easements.</p> <p>(ii) Section 801.5 defines a “solar easement” as the <u>“right of receiving sunlight across real property of another for any solar energy system.”</u></p> <ul style="list-style-type: none"> • A solar easement must therefore be created for the <u>sole purpose of accessing sunlight to create thermal or electric energy using a solar energy system</u>, as defined by Section 801.5. • A person merely seeking to access sunlight could not seek protections under Sections 801 and 801.5. <p>(iii) Section 801.5(b) specifies that “any instrument creating a solar easement” must, at a minimum, include all of the following:</p> <ul style="list-style-type: none"> • Description of the dimensions of the easement expressed in measurable terms;
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¹⁸ *Fox Creek Cmty. Ass’n v. Carson*, 1 CA-CV 11-0676, 2012 WL 2793206, (Ariz. Ct. App. 2012).

¹⁹ The home owner submitted that building the wall would have cost around \$12,800 to \$15,220 USD. The court held that the HOA’s requirements were reasonable restrictions, as they did not prohibit the installation of the solar device, despite the costs associated with the wall, as the device could have been installed in the fenced yard for a lower cost and with only a marginally lower level of expected energy output.

²⁰ California Civil Code § 801 and 801.5

	<ul style="list-style-type: none"> • Restrictions that would impair or obstruct the passage of sunlight through the easement; and • The terms or conditions, if any, under which the easement may be revised or terminated. <p>(iv) In the unpublished portion of its opinion, the <i>Zipperer v. County of Santa Clara</i>²¹ court specifically discusses the need for written documentation of a solar easement and holds that all solar easements must be written.</p>
Massachusetts	<p>Allow for creation of voluntary solar easements (NCCETC, 2017):</p> <p>(v) Solar access provisions in Massachusetts allow for the creation of <u>voluntary solar easements</u> to protect solar exposure and authorizes zoning rules that prohibit unreasonable restrictions on solar access. Solar easements in Massachusetts allow for the voluntary creation of solar access contracts, but do not make solar access an automatic right.</p> <p>(vi) In addition, the statutes allow for communities to authorize zoning boards to issue permits creating solar rights.</p>

(iv) Other mechanisms to overcome CC&Rs (other than state level solar access laws or solar easements):

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- A. **Appealing for change through the HOA board:** Home owners are subject to the decisions made by their HOAs. The HOA may stop home owners from installing solar panels or require them to remove solar panels that have already been installed. Home owners may appeal to the board of the HOA if they hope to change the decision; they may also lobby their state government for rights to solar access or solar easements. (SolarResourceGuide.org. (n.d.))
- B. **Express termination of the restrictive covenant:** The deed that conveyed the covenant may stipulate a time of expiration for the restriction. (Solar ABCS, 2008)
- C. **Modification of the terms:** A landowner who is subject to restrictive covenants may, by release or upon agreement with the other owners within the subdivision, modify the restrictions to make an exception for solar energy systems. (Solar ABCS, 2008)
- D. **Cancellation of the CC&R:** The owners subject to the restriction and the courts may terminate the restriction under certain conditions. (Solar ABCS, 2008)
- i. In a case in which a homeowner is violating a restriction, other parties to the covenant may sue to recover damages for breach of the covenant, or an injunction may be sought to enforce the restriction. The court may award damages or grant the injunction where it determines the activity is in fact a violation of a valid restriction. The court may, on the other hand, determine the activity is not a violation and deny an award of damages or the injunction. Or, the court may determine on the basis of “changed conditions” that the restriction is no longer valid and thus may order it cancelled.
 - ii. The latter instance is another method of terminating restrictive covenants that prohibit solar and one that has a good chance for success, given current energy policies favoring the use of solar energy (in certain states in the US).
 - iii. Where other homeowners have acted in violation of the same restrictive covenant and the homeowners in the subdivision took no action or approved of the action, the solar owner may allege a waiver or abandonment of the restriction.
- E. **City or county level laws** (Solar ABCS, 2008):
- i. Cities and counties in the U.S. are authorized to adopt ordinances for a variety of purposes. This typically includes the authority to prepare and enforce comprehensive plans, zoning regulations and building codes and to adopt ordinances and resolutions necessary for the

²¹ *Zipperer v. County of Santa Clara*, 35 Cal. Rptr. 3d 487 (2005)

exercise of its powers.

- ii. Despite these broad grants of power for local self-government, the local ordinance is still subject to judicial scrutiny. In addition to the requirement that an act be one within the authority of the local government, it must be reasonable, equal, and impartial in its operation.
- iii. However, there is a strong presumption of validity of a local ordinance, since local officials are in a better position than the courts are to have knowledge of any local conditions upon which the ordinance is predicated.

F. Education of those groups most likely to be involved in the dissemination and enforcement of CC&Rs (DOE, 2000):

- i. Some residential management organisations may be unaware of the laws addressing CC&Rs or may be misinformed about the benefits and costs of solar energy systems; they may also just follow older CC&R documents when drafting new ones without considering potential alternatives.
- ii. Educating these groups can mean informing them of the latest development in solar legislations, the benefits of solar energy systems and ways to mitigate aesthetic concerns.
- iii. For example, there is targeted education campaign in the U.S. which is endorsed by the Department of Energy Solar Buildings Program and administered by the National Renewable Energy Laboratories. It produced educational documents explaining the value of solar energy systems, installation guidelines addressing the concerns about the appearance of solar systems and documents illustrating the implications of the solar legislations in specific states.

Appendix 2: RE generation system installation barriers in Hong Kong

(附錄二：香港安裝可再生能源系統涉及的審批程序、業權和物業管理的問題)



- (i) **What are some major institutional barriers and restrictions in Hong Kong?**
- A. **“landlord-tenant” market failure:** “Often tenants that pay the electricity bill do not own or have legal rights to change the ventilation and air conditioning system, or make changes to the outside fabric of the building. These rights may rest with the owner or the building’s management company neither of whom are incentivized to make the necessary changes.” (Consumer Council, 2015)
 - B. **Lack of financial incentive for developers:** Project developers (who will pay the capital cost of an RE project such as BIPV) will not usually benefit from any income generated (for example, in reduced energy costs to the tenant). (EMSD, 2002)
 - C. **High entry barrier:** Costs are high because of the need to hire engineers; a lot of time and money required. (Greenpeace and WWF, 2017)
- (ii) **What are some ways to address these barriers and restrictions?**
- A. **Create incentives for land owners and management companies** to also come on board, so that they will allow property owners to install solar panels, and/or even initiate solar panel installation themselves
 - B. **Incentive, grants, soft loans and tax breaks for RE project developers** (may be offered at the financing and development stage, rather than just at the operation stage) (EMSD, 2002).
- (iii) **What are the opportunities in Hong Kong?**
- A. **Major corporations:** The property market in HK is a key sector dominated by a few firms – they are major listed companies facing international shareholder pressure and need to take corporate social and environmental responsibility into consideration (EMSD, 2002). Major energy consumers such as MTRC and major developers have the obligations to incentivise solar panels installations owing to their decisive power in HOAs. Government should advocate RE and REFIT policies through educating major energy consumers and developers about the corporate social responsibilities and economic benefits in promoting RE in their properties.
 - B. **Economies of scale:** Sub-urban areas in Hong Kong have potential to develop “renewable communities” (e.g. Marina Cove (匡湖居), Fairview Park (錦綉花園)) because of the potential economies of scale if installations are made on many relatively standardized buildings in the same residential gated community (Greenpeace and WWF, 2017).
 - C. **Solar access laws and solar easements:** We can consider these good practices from overseas and explore the possibility of introducing them to Hong Kong as mechanisms to counteract institutional barriers. *In Hong Kong where we face increasing pressure of inadequate housing partly due to limited suitable land supply, long-term town planning is a key consideration; for instance, if a brownfield were to be granted solar access for a number of years, high-rise residential development may be restricted in the surrounding land.*
- (iv) **What are the rules in Hong Kong?**
- A. **Ownership of installations:** The owners of the communal electrical installation in a building include the incorporated owners and the property management agent of that building. If there is no

incorporated owners, the owners of the communal electrical installation include the landlords, occupiers and tenants of all the individual residential units and shops. (Electrical and Mechanical Services Department [EMSD], 2017)

- B. **Management companies:** The management companies are answerable to the owners' corporation ("OC"), and the OC has the final say in major decisions. Therefore, the main concern should be the OC rather than the management company. (Home Affairs Department [HAD], 2015)
- C. **Property owners:** A property owner co-owns the common parts of the building with other owners. The formation of an OC facilitates the organization of owners to effectively manage their building. (Home Affairs Department [HAD], 2017)
 - i. No person may convert the common parts of a building to his own use unless such conversion is approved by a resolution of the owners' committee (if any). (Section 34I)
 - ii. In addition, no person may use or permit to be used the common parts of a building in such a manner as
 - 1. unreasonably to interfere with the use and enjoyment of those common parts by any owner or occupier; or
 - 2. to cause a nuisance or hazard to any person lawfully in the building.
- D. **Owners' Corporation:** An OC is a body corporate set up under the Building Management Ordinance²². It has the legal status to represent all owners in managing the common parts of the building. (HAD, 2015)
- E. **Building Authority:** If alterations and additions to the existing building structure are involved to support the additional system components, prior approval and consent from the Building Authority under the Building Ordinance and Lands Department are required. (Electrical and Mechanical Services Department, n.d.)

²² Building Management Ordinance, Cap 344 (2017).

Appendix 3: Seoul's RE policies

(附錄三：韓國首爾的可再生能源政策)



Background and Barriers

In 2011, Seoul's electricity self-reliance and reserve margin was 2.8% and 5.5% respectively, with 31% of its electricity from nuclear power. The city also consumed around 10% of South Korea's total energy and was forecasted to rise. Seoul's large-scale blackout in September 2011 and the wake of the Fukushima nuclear accident provided good ground for the Seoul Metropolitan Government to set targets to increase its energy self-reliance. Subsequently in 2012, they announced "The Comprehensive Plan for One Less Nuclear Power Plant" which aims to reduce energy consumption by 2 million (tons of oil equivalent), introduce energy efficiency and conservation measures, and increase renewable energy production. Phase 1 of this Plan was fulfilled in June 2014, 6 months ahead of schedule, and it has now entered into Phase 2 which aims to increase the city's electricity self-reliance to 20% by 2020.

Policies and Highlights

- (i) **Seoul-type FiT** is city-wide REFiT provides KRW100 (HK\$0.68)/kWh for up to 5 years
- (ii) **Government subsidies and support measures** lease of idle public lands and offer municipal land to cooperatives to install solar PV systems, provide loans with a preferential annual interest rate of 1.75% for PV systems of up to 150kW, reduce PV licensing period from 60 to 30 days and distribute solar PV panels to small apartment households for electricity production
- (iii) **Renewable Energy Certificates*** are available in South Korea which is similar to the US, by way of an obligatory renewable portfolio standard for major power producers

Solar Policies Available

- REFIT
- Net Metering*
- Solar Leasing
- RECs*
- RE Bonds*

Note: Available at the national level.

More information about South Korea and Singapore's RE policies are provided by the Legislative Council Secretariat and available at the following website:

<http://www.legco.gov.hk/research-publications/english/essentials-1516ise24-solar-power-development-in-seoul-and-singapore.htm#endnote4>

Appendix 4. List of expert panelists at the workshop

Code	Expert Panelist Background
EP 1	A foreign researcher with background in renewable energy policies and energy transition.
EP 2	A foreign university professor with background in environmental politics and policy
EP 3	A general manager from local utility company A
EP 4	A campaigner from a local NGO A
EP 5	An officer from a local NGO B
EP 6	A CEO from a local renewable energy company.