

Senior Secondary Liberal Studies
Learning and Teaching Exemplar
for NCS students (8)

Light Pollution in Hong Kong



Light Pollution in Hong Kong

A. Basic information of the lessons

Topic Light Pollution in Hong Kong

Relevant modules, themes and issues for enquiry

Leading Module 2: Hong Kong Today



Theme 1: Quality of Life

- What are the different opinions of Hong Kong residents on the priorities which constitute the quality of life?
- Which aspects of the quality of life are seen to be more important? Which are seen to be immediate needs? Who might make the decisions? Why?

Related Module 6: Energy Technology and the Environment



Theme 2: Environment and sustainable development

- How do the living styles of people and social development affect the environment and the use of energy?

Overall design rationale



The lessons start from understanding the definition, phenomenon and possible impacts of light pollution in Hong Kong (**Appendix 1**). Then teachers can introduce the Charter on External Lighting implemented debuted in 2015, the Hong Kong government's responses to public's concerns towards light pollution in Hong Kong. (**Appendix 2**). In this part, students are expected to identify the scope, mechanism, benefits and drawbacks of the charter.



To understand the possible barriers to achieving consensus among major stakeholders on the issue of regulating external lighting in Hong Kong, students have to first work in groups to identify the differences in the expectations and concerns among different stakeholders towards regulation of external lighting in Hong Kong (**Appendix 3**). Students are required to watch 3 parts of the video "Light Pollution" and answer questions 1-2 (P.17 – 20). Students are required to adopt the analytical framework (P.15) to complete the questions in their discussion.



To consolidate the common barriers to achieve consensus among different stakeholders that they have learnt in the lessons, students are required to complete a post-discussion summary after the class (**Appendix 3**, P.21).

**Time
required**



4 lessons (40 minutes per lesson), approximately 160 minutes in total

**Learning
objectives**



Knowledge:

- To understand the concepts related to light pollution and the interrelationship between human activities and the natural environment.
- To understand the current situation of light pollution in Hong Kong.
- To understand how the Hong Kong Government responds to the issue of light pollution and the policies it uses to tackle it.
- To understand the concerns of major stakeholders in light pollution and the possible barriers to achieve consensus among different stakeholders on regulating light pollution in Hong Kong.



Skills:

- To collect and summarise information from different sources.
- To express ideas in speaking and writing.
- To interpret data from different perspectives.
- To respond immediately to queries.



Values and attitudes:

- To care for and protect the natural environment, and to make insightful, reasonable and practical decisions about environmental protection.
- To consider personal and social issues from multiple perspectives and make sound judgments with reasoning and creativity.
- To foster positive attitude towards balancing different views and comprehensive consideration.
- To understand the importance of civic society in alleviating environmental problems led by commercial activities in Hong Kong.



Basic Concepts for application



Light pollution, LUX, the International Astronomical Union standard, type of external lighting installation, invasive light, melatonin, charter, legislation.



Relevant learning experience at junior secondary levels



- The role of individuals in environmental protection.
- The interdependence of living things and their environment.



Catering the learning needs of NCS students



- The arrangement of Jigsaw technique in group discussions aims to engage NCS students and allow them to learn from classmates with different strengths.
- The data file offers NCS students a variety of sources, from picture, video, data to cartoon to equip them with necessary skills in tackling different types of sources.
- The use of audio-visual learning materials may enhance the motivation of students in learning Liberal Studies.
- Guiding questions are set after each source in the data file. The questions guide the students to process the data and generalise the implication step by step. The questions could be used for lesson preparation or in-class discussion. Students would be able to build up knowledge with the support of simple sequential tasks.



B. Design of classroom learning and teaching

Lesson Learning and teaching strategies and flow

Before
class

Lesson preparation



Ask students to study Sources A to C about the definition and impacts of light pollution and answer questions 1-3 on P.10 (**Appendix 1**).

1&2



Lead in (around 10 minutes)

- Go over the pre-lesson preparation worksheet (**Appendix 1**) with students. The focus will be on the definition and impacts of light pollution.
- Remind students that there are various types of external lighting installation in Hong Kong, and public complaints against them have been increasing during 2014-2016 in general.



Individual task/ Pair-work (around 15 minutes)

- Show a short video about light pollution¹ to introduce the causes leading to light pollution in Hong Kong. If it fits students' learning progress, ask students to derive the factors from the causes identified in the video (**Appendix 1**, P.10).



Round up (around 5 minutes)

- Teachers conclude the definition, impacts and factors of light pollution in Hong Kong and ask students to think about the possible solutions to solve the problem.

¹ Source: RTHK (2013). Light Pollution.

Retrieved from http://podcast.rthk.hk/podcast/item_epi.php?pid=280&lang=en-US&id=36608





Group Discussion Activity (around 50 minutes)

Part A (around 10 minutes)

- Divide students into pairs and distribute worksheets for group discussion (**Appendix 2**). Ask students to answer questions 1-2 (P.12) with reference to Source A.
- Students present the discussion results (the number of presentation groups may vary depending on the lesson time).
- After students' presentation, conclude that business who take part in the voluntary Charter on External Lighting have to switch off external rooftop signs and non-statics lights used for decoration, promotion or advertising.

Part B (around 15 minutes)

- Prompt students to discuss the possible benefits and drawbacks for a business owner to sign Charter on External Lighting (Questions 3 on P.13, **Appendix 2**).
- Students present the discussion results (the number of presentation groups may vary depending on the lesson time).
- Summarise the possible benefits and drawbacks for business owner to sign Charter on External Lighting and not to join the Charter on External Lighting respectively..

Part C (around 15 minutes)

- Prompt students to identify the factors considered by different groups when they are analysing the benefits and drawbacks of joining the Charter on External Lighting as a business owner. Prompt students to predict the possible challenge for the government to put forward a Charter on External Lighting to cope with light pollution in Hong Kong (Questions 4 & 5 on P.14, **Appendix 2**).
- Students present the discussion results (the number of presentation groups may vary depending on the lesson time).
- Summarise the factors affecting the considerations of business owners and the possible challenges for the government to put forward the Charter on External Lighting.





Summary (around 10 minutes)

- Teachers conclude the challenges that the government may face when putting forward the charter and ask students to reflect the considerations behind.

3&4



Lead-in by questioning (around 10 minutes)

- Ask students *if they come up with a reason* to explain why the government chose to adopt a voluntary Charter on External Lighting if they can foresee the challenges in asking companies to join it on a voluntary basis.
- Teachers introduce the topic for discussion “What are the barriers to achieving consensus among major stakeholders on the issue of regulating external lighting in Hong Kong?”, the analytical framework and common barriers for stakeholders to reach consensus on an issue. Students have to identify the possible barriers to achieving consensus among major stakeholders on the issue of regulating external lighting in Hong Kong and the possible reasons leading to it with reference to the analytical framework and criteria provided (**Appendix 3**, P.13).



Students watching video, followed by teacher elaboration (around 20 minutes)

Part A (around 7 minutes)

- Teachers play Part 1 of the video (Source A) and ask students to complete question 1(a) (**Appendix 3**, P.14). Teachers should check the answers of question 1(a) with students immediately and ask students to identify the differences between about the government and other NGOs towards the seriousness of light pollution in Hong Kong.

Part B (around 13 minutes)

- Teachers then ask students to complete question 1(b) by identifying the first possible “barrier” for major stakeholders to reach consensus on the “need of regulation of external light pollution” (**Appendix 3**, P.14).





Group discussion and presentation, and teachers summary (around 40 minutes)

Part A (around 20 minutes)

- Teachers play Parts 2 and 3 of the video (Source A) and divide students into four groups (in the case of a large number of students, make arrangements based on actual circumstances) with each group responsible for working on identifying **one stakeholder, their stance, considerations and concerns** in question 2(a) and 2(b) (**Appendix 3, P.15**).
- Teachers check the answers of 2(a) and 2(b) with students and guide students to complete 2(c) by identifying one the pair of stakeholders who may be in conflict on the issue of regulating external lighting through legislation, by identifying stakeholders with different stances, or with same stance but with different concerns or priorities (**Appendix 3, P.16**). For other possible pairs of stakeholders who may be in conflict, teachers may refer to P.22-23 for the reference answers.
- Students present the results of discussion (the number of presentation groups may vary depending on the lesson time).



Part B (around 20 minutes)

- Summarize 2 to 3 pairs of stakeholders from students' presentation and ask students to complete 2(d) by identifying two out of three possible barriers for major stakeholders to reach consensus on the “need of regulation of external light pollution” (**Appendix 3, P.20**).
- Students report their conclusion about the barriers for major stakeholders to reach consensus on the “need of regulation of external light pollution” (**Appendix 3, P.20**). Teachers may help students to clarify and elaborate their answers (i.e. barriers, reasons and evidence) with reference to the sources. Emphasis should be put on whether the barriers they identified are really difficult to be solved and the reasons behind.



Feedback on the discussion results (around 10 minutes)

- Summarise all types of possible barriers for major stakeholders to reach consensus on an issue in general in question 3 (**Appendix 3, P.21**).



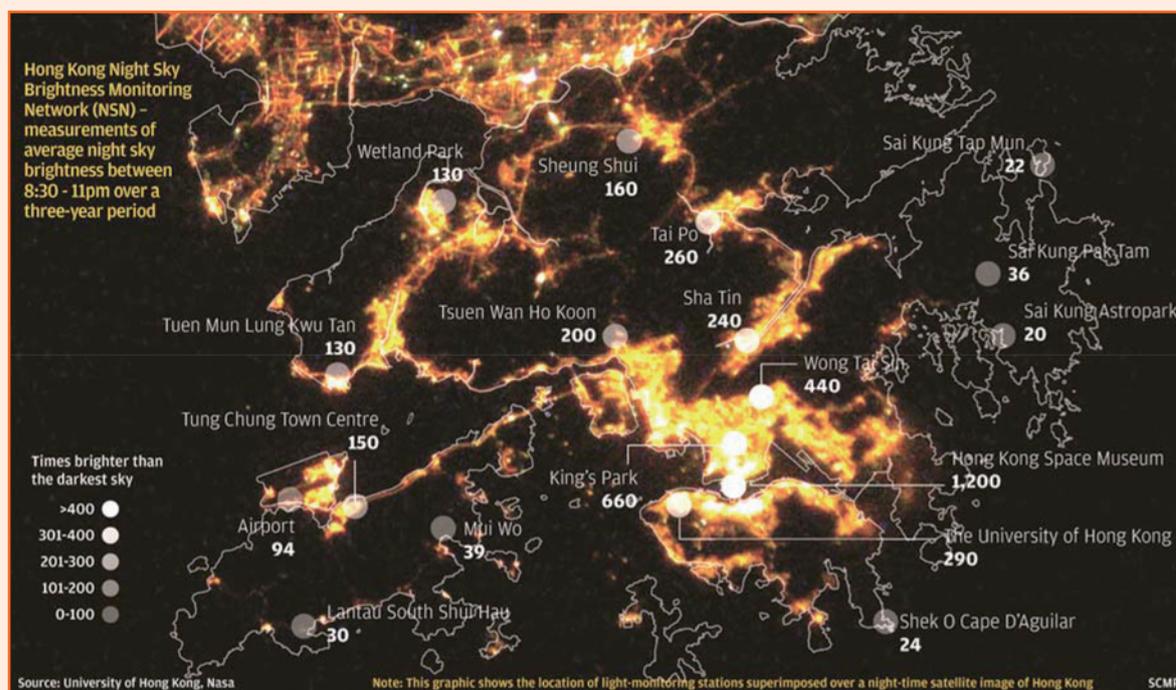
Appendix I: Light Pollution in Hong Kong

Read the following sources carefully and answer questions 1-3.

SOURCE A Light pollution in Hong Kong

- Light pollution is artificial light to shine outward and upward into the sky, where it's not wanted, instead of focusing it downward. It is largely the result of bad lighting design.
- Hong Kong is believed to be the world's worst city for light pollution. In the world's largest light pollution study, with levels in Tsim Sha Tsui (from 8.30pm to 11pm) 1,200 times higher than the International Astronomical Union standard. There is nowhere else on earth as badly affected.

While the Astropark stargazing facility near High Island Reservoir – where most would expect a natural dark sky – has a reading of 20 times the standard, that at the Wetland Park in Tin Shui Wai is even more alarming, at 130 times the standard.



Source: SCMP. (2013, March 20). Light pollution in HK 'worst on the planet'. Retrieved from <https://www.scmp.com/news/hong-kong/article/1194996/light-pollution-hong-kong-worst-planet>



SOURCE B Complaints by type of external lighting installation in Hong Kong *

Type of External Lighting		Year		
		2014	2015	2016
Lighting for shops and signboards		105	119	124
Lighting installations for buildings	Facades and features	29	16	54
	Others (e.g. rooftops, podiums, passageways)	15	6	18
Video walls		12	28	38
Lighting for construction sites (some of the installations are related to illuminated signboards)		19	23	34
Lighting for sports fields and playgrounds		2	3	7
Others (such as street lighting and lighting for schools, car parks, swimming pools, race courses, golf ranges and cargo handling areas)		47	61	62
Total		229	256	337

* received by the Environmental Protection Department

Source: Environmental Protection Department, HKSAR Government. (2017). Breakdown of complaints by type of external lighting installation received by the Environmental Protection Department. Retrieved from https://gia.info.gov.hk/general/201707/05/P2017070500421_262575_1_1499240846824.pdf

SOURCE C Impact of light pollution

Researchers found excessive brightness of varying degrees that scientists said could damage health and wildlife because ill-designed lighting washes out the darkness of night and radically alters the light levels—and light rhythms—to which many forms of life, including ourselves, have adapted. Wherever human light spills into the natural world, some aspect of life—migration, reproduction, feeding—is affected.

Health specialists say light pollution could disrupt the biological clock and affect brain and hormone function. Hong Kong Entomological Society chairman Yiu Vor said he feared the brightness would affect the breeding of fireflies, including the endemic bent-winged firefly, which relied on light signals to mate. “They might not be able to notice the signals in a bright environment or they simply release the signal less frequently. This would affect their continuing survival.” Yiu said insects that relied on moonlight to navigate could also be affected.

Source: SCMP. (2013, March 20). Light pollution in HK ‘worst on the planet’. Retrieved from <https://www.scmp.com/news/hong-kong/article/1194996/light-pollution-hong-kong-worst-planet>



SOURCE D

Video: “**Light Pollution**”, Hong Kong Connection by RTHK

Date: 12 December 2013

Duration: **watch from 5:00 - 8:15**

Language: English voice-over accompanied by English subtitles

URL: http://podcast.rthk.hk/podcast/item_epi.php?pid=280&lang=en-US&id=36608

Vocabulary

- | | |
|----------------|-----|
| 1. Signs | 標誌 |
| 2. Billboards | 廣告牌 |
| 3. Distraught | 極煩惱 |
| 4. Myopia | 近視 |
| 5. Astigmatism | 散光 |
| 6. Microcosm | 縮影 |
| 7. Harassment | 騷擾 |



1. From Sources A and B, **how serious** is light pollution in Hong Kong?
2. From Source D, what **causes** have led to light pollutions in Hong Kong? Derive the **factors** from each cause correspondingly after completing the causes.
3. From Sources C and D, what are the **impacts** of light pollutions in Hong Kong?

(1)

The situation of light pollution in Hong Kong (Sources A & B)	Causes (Source D)	Factors
<p>1. Light pollution in Hong Kong is _____ as it is believed to be the world's _____ city for light pollution, with levels in Tsim Sha Tsui _____ higher than the IAU standard.</p> <p>2. Complaints to external lighting were _____ from 2014-2016, showing impacts of external lighting to nearby residents are becoming more _____ during the period.</p>	<p>Hint: Design and brightness:</p> <ul style="list-style-type: none"> ● Poor design of _____ ● _____ ● _____ (6:04) ● The electricity bill spent on signage lights is _____ comparing to stores' profits(7:28) ● _____ (8:07) 	<p>Design of External lighting</p> <p>→ _____</p> <p>→ _____</p> <p>→ _____</p> <p>→ _____</p>



(3)

Aspect of Quality of life	Impacts	Examples (Sources C & D)
_____	_____	<ul style="list-style-type: none"> ● Affect the migration and reproduction of some aspects of life. (Source C)
Social	Affect public health of human beings	<ul style="list-style-type: none"> ● Disrupt: _____ _____ (Source D)



Appendix 2: How did the Hong Kong government regulate external lighting in Hong Kong?

Read Source A carefully and answer questions 1-3.

SOURCE A the Charter on External Lighting



Source: The Hong Kong Polytechnic University. (2019). Charter on External Lighting takes effect and PolyU pledges its support. Retrieved from https://www.polyu.edu.hk/greencampus/en/green-tips/green-infokit/index.php?option=com_content&view=article&id=459&catid=24&Itemid=157

The Environment Bureau (ENB) launched the “Charter on External Lighting” (the “Charter”) in 2016 to invite owners of and responsible persons for external lighting installations to switch off lighting installations of decorative, promotional or advertising purposes which affect the outdoor environment during the preset time (i.e. 11 p.m. or midnight to 7 a.m. on the following day).

Participants which comply with the switch-off requirement will receive the following awards:

- (i) **Platinum Award:** switch off external lighting from 11 p.m. to 7 a.m. on the following day
- (ii) **Gold Award:** switch off external lighting from midnight to 7 a.m. on the following day

Exempted external lighting installations

- (i) Shop-front signs of shops on the ground floor which remain open at the preset time
- (ii) Festive lightings
- (iii) Lighting for security, safety and operational purposes (e.g. street lighting, lighting at airport and container port, construction sites, etc.)

Source: Environment Bureau, HKSAR Government. (2017). Charter on External Lighting. Retrieved from <https://www.charteronexternallighting.gov.hk/en/introduction/introduction.html>

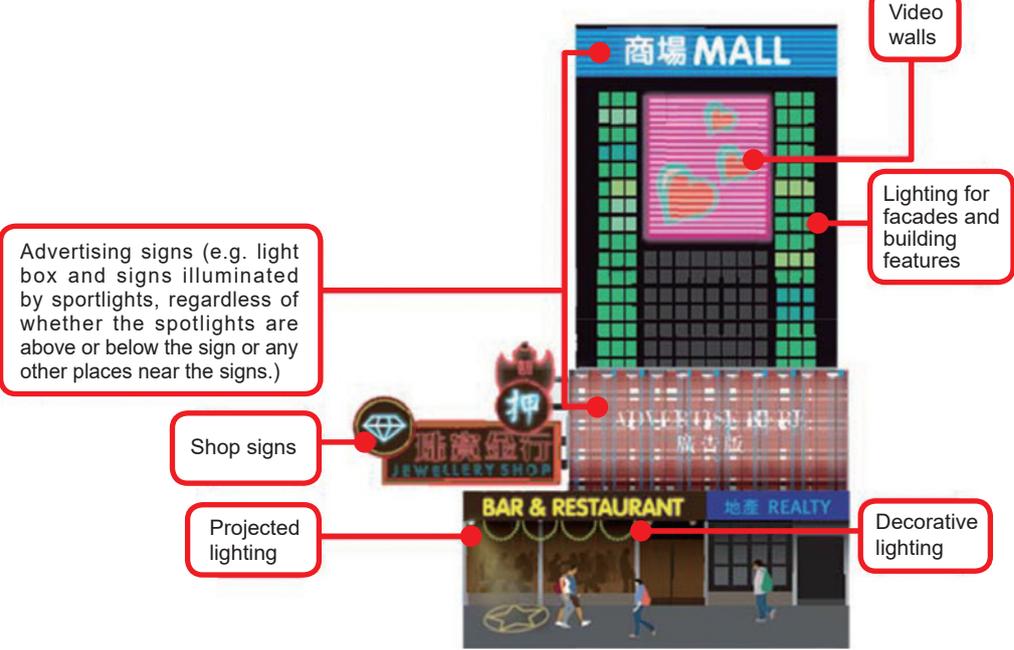
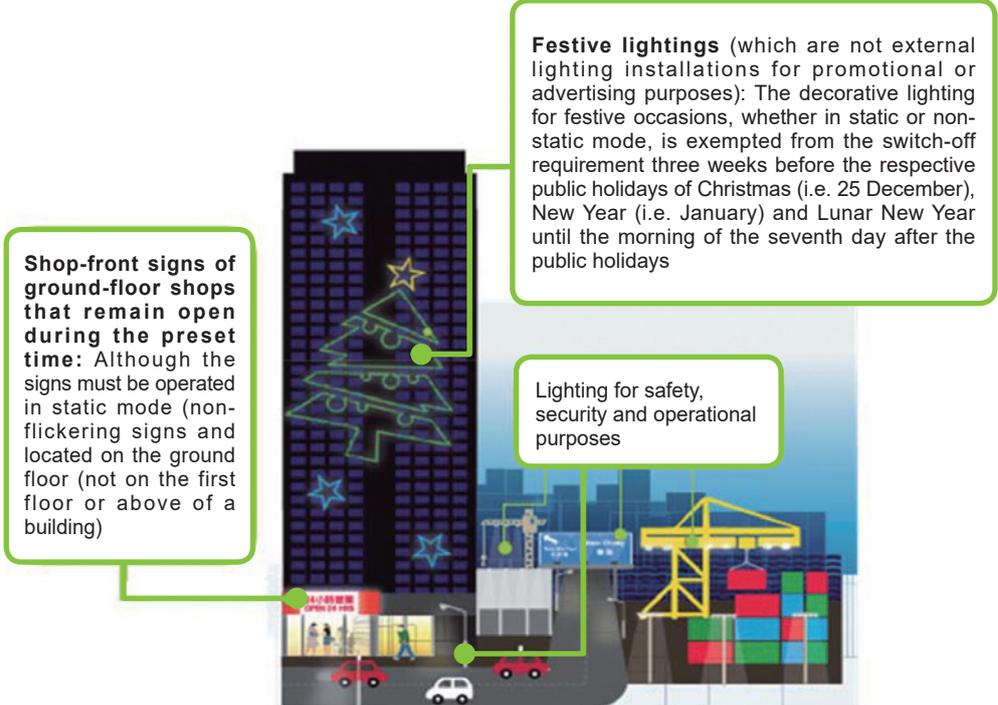
Question:

1. From Source A, what is the period of regulated hours, if participated, as stated in the Charter on External Lighting?

Basic

2. From Source A, what are the types of external lighting to be regulated according to the Charter on External Lighting? Circle the answer.

Advanced

Scope (Circle the correct type)	Types of External Lighting (Circle and label the type of lighting)
Regulated / Not regulated (exempted)	 <p>Advertising signs (e.g. light box and signs illuminated by spotlights, regardless of whether the spotlights are above or below the sign or any other places near the signs.)</p> <p>Shop signs</p> <p>Projected lighting</p> <p>Video walls</p> <p>Lighting for facades and building features</p> <p>Decorative lighting</p>
Regulated / Not regulated (exempted)	 <p>Shop-front signs of ground-floor shops that remain open during the preset time: Although the signs must be operated in static mode (non-flickering signs and located on the ground floor (not on the first floor or above of a building))</p> <p>Festive lightings (which are not external lighting installations for promotional or advertising purposes): The decorative lighting for festive occasions, whether in static or non-static mode, is exempted from the switch-off requirement three weeks before the respective public holidays of Christmas (i.e. 25 December), New Year (i.e. January) and Lunar New Year until the morning of the seventh day after the public holidays</p> <p>Lighting for safety, security and operational purposes</p>

Source: Environment Bureau, HKSAR Government. (2017). Charter on External Lighting – FAQ. Retrieved from <http://www.charteronexternallighting.gov.hk/en/faq/faq.html>

3. If you were a business owner considering whether to sign the Charter on External Lighting (Source A),

(a) what are the benefits and drawbacks of joining and NOT joining the Charter respectively?

(b) Will you join the Charter voluntarily? Why?

Advanced

Stance	Benefits	Drawbacks
JOINING the Charter	1. 2.	1.
NOT JOINING the Charter	1.	1.
Stance	My decision: I <u>will</u> / <u>will not</u> join the Charter.	
Reason:		



4. From other groups' presentations, what do you think are the **possible factors** affecting business owners' decision in joining the Charter on External Lighting or not?

Advanced

Aspect	Possible Factors
Economic/ Social/ Political/ Environmental/ Cultural	1. _____ 2. _____ 3. _____

5. From the responses of other groups' presentations, do you think the Charter on External Lighting will be **effective** in addressing light pollution? Why?

Advanced

Stance	_____
Reason(s)	_____ _____ _____



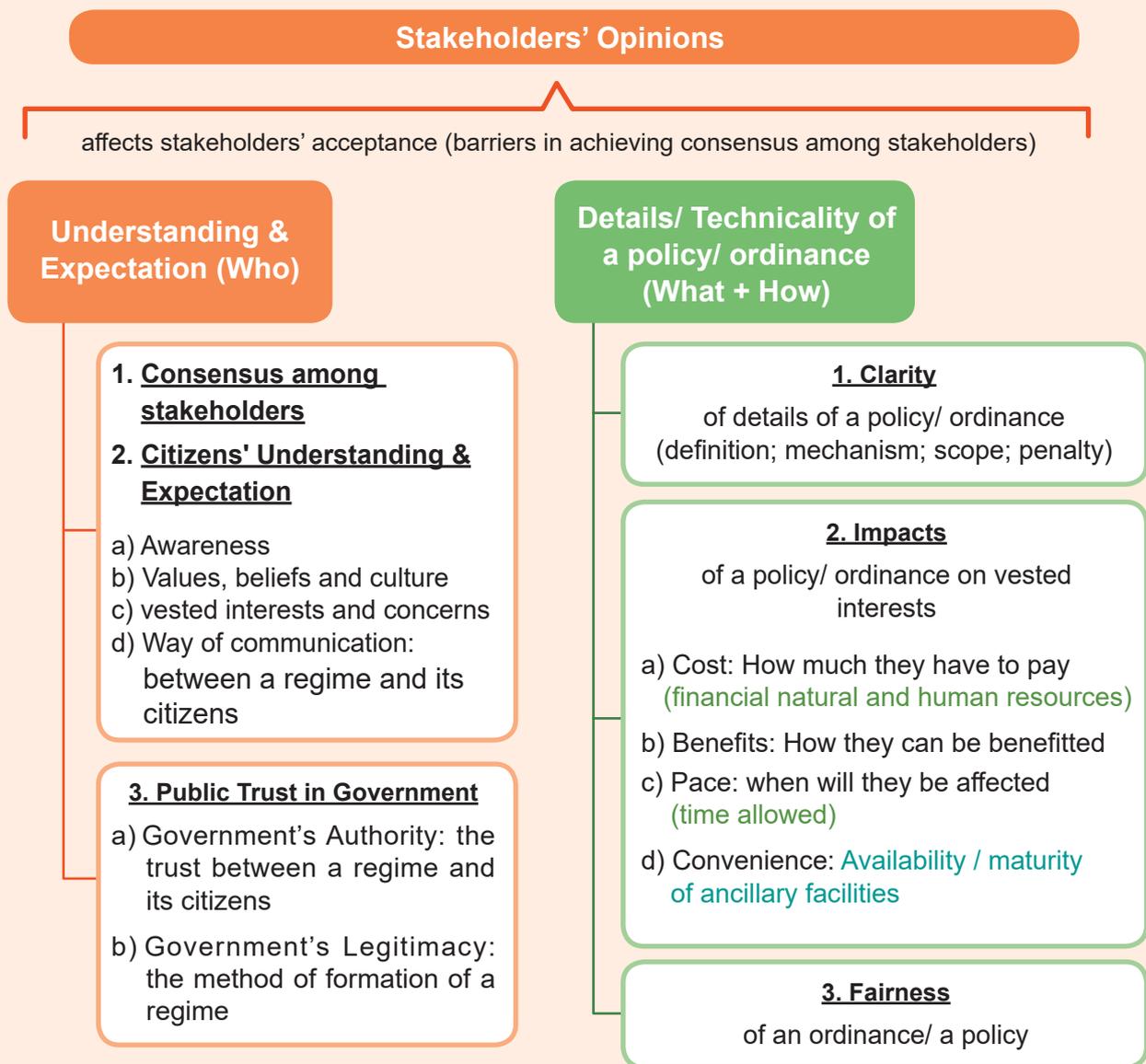
Appendix 3:

What are the barriers to achieving consensus among major stakeholders on the issue of regulating external lighting in Hong Kong?

By adopting the following analytical framework, answer the questions 1 - 3.

Barriers to achieve consensus among major stakeholders

A failure in achieving consensus among major stakeholders often means “**conflicts** among major stakeholders”. It usually comes from **differences** among stakeholders in “**understanding and expectation**” and “**details / technicality of a policy / ordinance**” set by the government.



2. (a) From Source A (Part 2 & 3), identify the **stance** and **considerations** of the major stakeholders in regulating external lighting in Hong Kong.

Basic

(b) From question (a), analyse the stakeholders' **concerns** on the necessity, way/ pace and cost of regulating external lighting in Hong Kong.

Advanced

(a) Stakeholders	(a) Stance	(a) Personal considerations	(b) Stakeholders' concerns on legislation
<p>EXAMPLE</p> <p>Local residents affected by light pollution</p> <p>Part 1 (11:50 - 13:28)</p>	<p>For / Neutral/ Against</p>	<p>Personal considerations:</p> <ul style="list-style-type: none"> - Personal sleeping quality - Personal health of eyes 	<p>Stakeholders' concerns:</p> <p>(1) <u>Need/ urgency</u>;</p> <p>(2) <u>Way & Pace</u>;</p> <p>(3) <u>Impacts</u> of regulating external lighting</p>
<p>_____</p> <p>Part 2 (9:08 - 9:59)</p>	<p>For / Neutral/ Against</p>	<p>Personal considerations:</p> <p>- the _____ of regulation _____</p> <p>_____</p> <p>_____</p>	<p>Stakeholders' concerns:</p> <p>(1) <u>Need/ urgency</u>;</p> <p>(2) <u>Way & Pace</u>;</p> <p>(3) <u>Impacts</u> of regulating external lighting</p>
<p>_____</p> <p>Part 3 (16:04 - 16:08)</p>	<p>For / Neutral/ Against</p>	<p>Personal considerations:</p> <p>_____</p> <p>_____</p> <p>(Sustainability of businesses/ income of business)</p>	<p>Stakeholders' concerns:</p> <p>(1) <u>Need/ urgency</u>;</p> <p>(2) <u>Way & Pace</u>;</p> <p>(3) <u>Impacts</u> of regulating external lighting</p>
<p>_____</p> <p>Part 3 (16:08 - 16:15)</p> <p>&</p> <p>_____</p> <p>Part 3 (16:15 - 17:24)</p>	<p>For / Neutral/ Against</p>	<p>Personal considerations:</p> <p>-Supported regulating light pollution, but doubted the _____ of _____</p> <p>_____</p> <p>_____ are more important than their own due to cut-throat competition</p>	<p>Stakeholders' concerns:</p> <p>(1) <u>Need/ urgency</u>;</p> <p>(2) <u>Way & Pace</u>;</p> <p>(3) <u>Impacts</u> of regulating external lighting</p>
<p>_____</p> <p>Part 3 (17:24 - 18:00)</p>	<p>For / Neutral/ Against</p>	<p>Personal considerations:</p> <ul style="list-style-type: none"> - _____ - _____ - _____ 	<p>Stakeholders' concerns:</p> <p>(1) <u>Need/ urgency</u>;</p> <p>(2) <u>Way & Pace</u>;</p> <p>(3) <u>Impacts</u> of regulating external lighting</p>

(c) From 2(a) and 2(b), identify one pair of stakeholders who may be in conflict on the issue of regulating external lighting through legislation. Analyse the point and reason(s) of conflict behind.

Advanced

Stakeholder A	Point of Conflict	Stakeholder B
<p>STEP (1a) - Stakeholder A</p> <p>_____</p> <p>_____</p> <p>support / oppose</p>	<p>STEP (2a) Point of Conflict (Aspect & Issue):</p> <p>(1) <u>Need/ urgency:</u></p> <p>(2) <u>Way & Pace:</u></p> <p>(3) <u>Impacts</u></p> <p>of regulating external lighting</p>	<p>STEP (1a) - Stakeholder B</p> <p>_____</p> <p>_____</p> <p>support / oppose</p>
<p>↑ led to</p> <p>STEP (1b) – Concern (and value) of Stakeholder A</p> <p>_____</p> <p>_____</p>	<p>→ led to</p> <p>STEP (2b) Reason of Conflict:</p> <p>(1) <u>Conflict of interests :</u></p> <p>(2) <u>Conflict of views due to incompatible values:</u></p> <p>(3) <u>Differences in understanding/ expectation.</u></p> <p><i>While A believes</i> _____</p> <p>_____</p> <p><i>B believes that</i> _____</p> <p>_____</p>	<p>← led to</p> <p>STEP (1b) – Concern (and value) of Stakeholder B</p> <p>_____</p> <p>_____</p>



(d) With reference to 2(a) - (c), identify **THREE possible barriers** to achieving consensus among major stakeholders on the issue of regulating external lighting in Hong Kong.

Advanced

Hints:

“Who + When + What” should be involved in regulating the external lighting in Hong Kong

<p>Who</p> <ul style="list-style-type: none"> - Did any of the stakeholders oppose regulations on external lighting in the consultation? Why? - What does that mean to the government? 	
<p>When</p> <ul style="list-style-type: none"> - How long did it take the government to suggest the regulation proposed by its consultation on the regulation on external lighting? Do you think it is long? Why? 	
<p>What</p> <ul style="list-style-type: none"> - What the methods of regulating external lighting difficulties were once considered? - Why were they dismissed? 	



3. From questions 1 and 2, what are the barriers to achieving consensus among major stakeholders in general?

Types of Barriers	Possible causes leading to the barrier
<p>Initiation:</p> <hr/> <hr/> <p>due to: different understanding/ expectation towards a policy/ an ordinance among them</p>	<ul style="list-style-type: none"> ● the necessity of regulation [WHY] ● the pace/ urgency of regulation [WHEN]
<p>Process:</p> <hr/> <hr/> <hr/> <p>due to: the differences in the _____ of a policy/ an ordinance on them.</p>	
<p>Conclusion:</p> <p>Difficult to reach a consensus on the</p> <hr/> <hr/> <p>due to: the limitation of a policy/ ordinance in meeting</p> <hr/> <hr/>	<ul style="list-style-type: none"> ● the way/ mechanism of regulation [HOW] ● the scope (e.g. targets and time) of regulation [WHO + WHERE] ● Cost of a solution to be shared [HOW MUCH]



Reference answers for 2(c) of Appendix 3

2.(c) Other possible pairs of stakeholders who may be in conflict on the issue of regulating external lighting through legislation. Analyse the point and reason(s) of conflict behind.

Advanced

Stakeholder A	Point of Conflict	Stakeholder B
<p>STEP (1a) - Stakeholder A</p> <p>_____</p> <p>_____</p> <p>support / oppose</p> <p>↑ led to</p> <p>STEP (1b) – Concern (and value) of Stakeholder A</p> <p>_____</p> <p>_____</p>	<p>STEP (2a) Point of Conflict (Aspect & Issue):</p> <p>(1) <u>Need/ urgency</u>;</p> <p>(2) <u>Way & Pace</u>;</p> <p>(3) <u>Impacts</u></p> <p>of regulating external lighting</p> <p>STEP (2b) Reason of Conflict:</p> <p>(1) <u>Conflict of interests</u> ;</p> <p>(2) <u>Conflict of views</u> due to <u>incompatible values</u>;</p> <p>(3) <u>Differences in understanding/ expectation</u>.</p> <p>While A believes that _____</p> <p>_____</p> <p>B believes that _____</p> <p>_____</p>	<p>STEP (1a) - Stakeholder B</p> <p>_____</p> <p>_____</p> <p>support / oppose</p> <p>↑ led to</p> <p>STEP (1b) – Concern (and value) of Stakeholder B</p> <p>_____</p> <p>_____</p>
<p>STEP (1a) - Stakeholder A</p> <p>_____</p> <p>_____</p> <p>support / oppose</p> <p>↑ led to</p>	<p>STEP (2a) Point of Conflict (Aspect & Issue):</p> <p>(1) <u>Need/ urgency</u>;</p> <p>(2) <u>Way & Pace</u>;</p> <p>(3) <u>Impacts</u></p> <p>of regulating external lighting</p>	<p>STEP (1a) - Stakeholder B</p> <p>_____</p> <p>_____</p> <p>support / oppose</p> <p>↑ led to</p>
Stakeholder A	Point of Conflict	Stakeholder B
<p>STEP (1b) - Concern (and value) of Stakeholder A</p> <p>_____</p> <p>_____</p>	<p>STEP (2b) Reason of Conflict:</p> <p>(1) <u>Conflict of interests</u> ;</p> <p>(2) <u>Conflict of views</u> due to <u>incompatible values</u>;</p> <p>(3) <u>Differences in understanding/ expectation</u>.</p> <p>While A prefers _____</p> <p>_____</p> <p>B prefers to _____</p> <p>_____</p>	<p>STEP (1b) – Concern (and value) of Stakeholder B</p> <p>_____</p> <p>_____</p>

Guidelines for Teachers

(P.232)

1. From Sources A and B, **how serious** is light pollution in Hong Kong?
2. From Source D, what **causes** have led to light pollutions in Hong Kong? Derive the factors from each cause correspondingly after completing the causes.
3. From Sources C and D, what are the **impacts** of light pollutions in Hong Kong?

(1)

The situation of light pollution in Hong Kong (Sources A & B)
<p>1. Light pollution in Hong Kong is <u>serious</u> as it is believed to be the world's <u>worst</u> city for light pollution, with levels in Tsim Sha Tsui <u>1,200 times</u> higher than the IAU standard.</p> <p>2. Complaints to external lighting were <u>increasing</u> from 2014-2016, showing impacts of external lighting to nearby residents are becoming more <u>serious</u> during the period.</p>

(2)

Causes (Source D)	Factors
<p>Hint: Design and brightness:</p> <ul style="list-style-type: none"> ● Poor design of <u>lights</u> ● <u>Strong brightness</u> 	<p>Design of External lighting</p>
<ul style="list-style-type: none"> ● <u>Lack of control/ No law to regulate the use of outdoor lighting (free – for-all area for lights)</u> (6:04) 	<p><u>Lack of Rules and regulations</u></p>
<ul style="list-style-type: none"> ● The electricity bill spent on signage lights is <u>insignificant</u> comparing to stores' profits (7:28) 	<p><u>Economic incentive</u></p>
<ul style="list-style-type: none"> ● <u>Retailing shops tend to use brighter lighting</u> (8:07) 	<p><u>Advancement of Technology</u></p>

Led to

(3)

Aspect of Quality of life	Impacts	Examples (Sources C & D)
<u>Environmental</u>	<u>Distort the natural habitat (health and lives of animals)</u>	<ul style="list-style-type: none"> ● Affect the migration and reproduction of some aspects of life. (Source C)
Social	Affect public health of human beings	<ul style="list-style-type: none"> ● Disrupt: <u>the biological clock and affect brain and hormone function → harm physical and mental health.</u> (Source D)



(P.234)

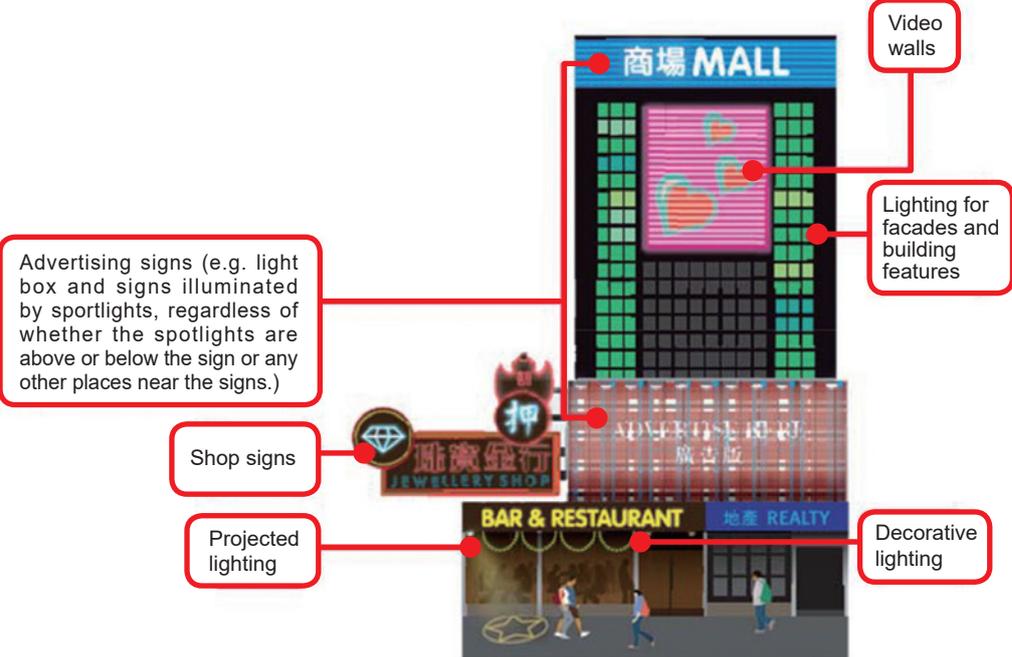
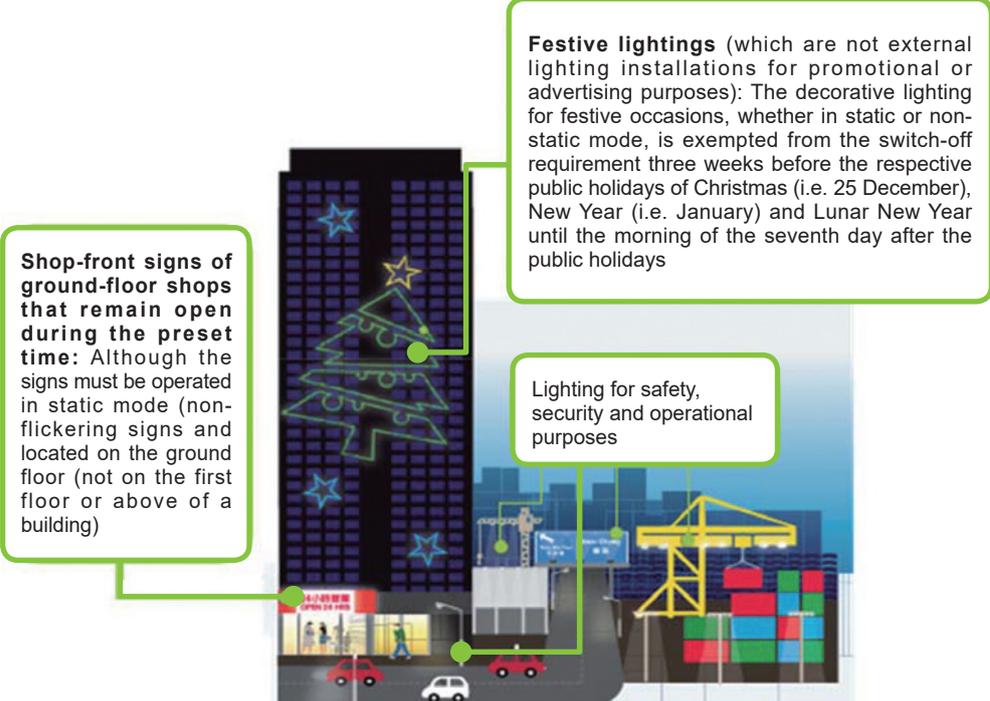
1. From Source A, what is the period of regulated hours, if participated, as stated in the Charter on External Lighting?

Basic

11 p.m. to 7 a.m.

2. From Source A, what are the types of external lighting to be regulated according to the Charter on External Lighting? Circle the answer.

Advanced

<p>Scope (Circle the correct type)</p>	<p>Types of External Lighting (Circle and label the type of lighting)</p>
<p><u>Regulated</u> / Not regulated (exempted)</p>	 <p>Video walls</p> <p>Advertising signs (e.g. light box and signs illuminated by spotlights, regardless of whether the spotlights are above or below the sign or any other places near the signs.)</p> <p>Lighting for facades and building features</p> <p>Shop signs</p> <p>Projected lighting</p> <p>Decorative lighting</p>
<p>Regulated / <u>Not regulated</u> (exempted)</p>	 <p>Shop-front signs of ground-floor shops that remain open during the preset time: Although the signs must be operated in static mode (non-flickering signs and located on the ground floor (not on the first floor or above of a building))</p> <p>Festive lightings (which are not external lighting installations for promotional or advertising purposes): The decorative lighting for festive occasions, whether in static or non-static mode, is exempted from the switch-off requirement three weeks before the respective public holidays of Christmas (i.e. 25 December), New Year (i.e. January) and Lunar New Year until the morning of the seventh day after the public holidays</p> <p>Lighting for safety, security and operational purposes</p>

3. If you were a business owner considering whether to sign the Charter on External Lighting (Source A),

(a) what are the *benefits* and *drawbacks of joining and NOT joining* the Charter respectively?

(b) Will you join the Charter voluntarily? Why?

Advanced

Stance	Benefits	Drawbacks
JOINING the Charter	<p>1. Economic x Social x long term: can improve my company's public image and hence its income in the long run.</p> <p>2. Economic: my company can save cost by reducing our spending on electricity bill without compromising our brand's promotion.</p>	<p>2. Economic x short term: if some of my rivals do not join the Charter, I would be left in the dark when others are still promoting their brands and products/ services to their potential customers in the mid night and losing my brand's influence and income in the long run.</p>
NOT JOINING the Charter	<p>2. Economic: can increase the effectiveness of our brand's penetration/ promotion, or at least maintain our status quo, by keeping our commercial external advertisement boards.</p>	<p>2. Economic x Social x long term: if all my rivals are joining the Charter, my company will be left out and look indifferent and irresponsible to public health, hence ruining my company's public image and income in the long run.</p>

Stance	My decision: I <u>will</u> / will not join the Charter.
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Reason:

[WILL] the only drawback of join the charter is that I may lose my promotion opportunity in the mid night, which is not that influential given that there are only limited pedestrians walking on the street in the midnight and the promotional method is indeed shifting from towards Internet nowadays. It is outweighed by the potential benefits including my company's public image and income long term.

[WILL NOT] the only drawback of NOT joining the charter is that my company will look indifferent and irresponsible to public health. However, there is a limited amount of people value "Corporate Social Responsibility" in Hong Kong. What they care most is cost-effectiveness and whether a brand can help them become conspicuous. It is outweighed by the benefits of making full use of our external advertisement boards to promote our brand image in the long term.



(P.238-242)

1. (a) From Source A (Part 1), identify the differences in **understanding** between non-government entities (medical field and private consultants) and the government on the **impacts** of external lighting.

Basic

Understanding of the government towards the impacts of external lighting	Understanding of non-government entities towards the impacts of external lighting
<p>A medical research quoted in a consultation document of the Environment Bureau:</p> <p>External light entering homes is so <u>weak</u> , which is less than <u>10 lux</u> , that it is unlikely to curtail the secretion of melatonin.</p>	<p>Other medical researches:</p> <p>The presence of excessive light at night while a person is at rest may <u>suppress</u> melatonin, which is useful in <u>fighting</u> carcinogens.</p>
<p>The energy consumed by street lightings was just <u>0.25%</u> of Hong Kong's total consumption, which may be useful to estimate that of all external lighting.</p>	<p>Private consultants:</p> <p>The signage lights on Chater Road and Des Voeux Road in Central consume nearly <u>4,000</u> watts of electricity per day, and that on Sai Yeung Choi Street South and Nathan Road in MongKok consumes <u>6,600</u> watts per day, equivalent to the <u>per capita</u> consumption per year in Hong Kong.</p>

(b) From question 1(a), identify **ONE barrier** to engage different stakeholders to discuss the need of regulation of external lighting in Hong Kong.

Advanced

<p>Why</p> <p>- What are the <u>possible stances/ views</u> of both stakeholders on the need of regulation of external lighting in Hong Kong? Do they share the same stance/ view?</p> <p>- What challenges may arise if their stances/ views are different?</p>	<p><u>A lack of consensus on the impacts of external lighting make it difficult for the government to:</u></p> <p>(3) <u>engage stakeholders to discuss and reach consensus on the 'necessity' of regulating external lighting</u></p> <p>(4) <u>decide the strategy/ approach of implementation/ monitoring to take as it cannot judge the urgency and necessity.</u> <u>e.g. Voluntary or mandatory; How to check against the intensity of lighting; determine the acceptable level of lighting, how to monitor whether companies abide by the regulation on the time of night lighting)</u></p>
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2. (a) From Source A (Part 2 & 3), identify the **stance** and **considerations** of the major stakeholders in regulating external lighting in Hong Kong.

Basic

(b) From question (a), analyse the stakeholders' **concerns** on the necessity, way/ pace and cost of regulating external lighting in Hong Kong.

Advanced

(a) Stakeholders	(a) Stance	(a) Personal considerations	(b) Stakeholders' concerns on legislation
<p>EXAMPLE</p> <p>Local residents affected by light pollution</p> <p>Part 1 (11:50 - 13:28)</p>	<p>For / Neutral/ Against</p>	<p>Personal considerations:</p> <ul style="list-style-type: none"> - Personal sleeping quality - Personal health of eyes 	<p>Stakeholders' concerns:</p> <ol style="list-style-type: none"> (1) <u>Need/ urgency</u>; (2) <u>Way & Pace</u>; (3) <u>Impacts</u> of regulating external lighting
<p><u>Lau Chi-fung</u> Chairman of Hong Kong Astronomical Society</p> <p>Part 2 (9:08 - 9:59)</p>	<p>For / Neutral/ Against</p>	<p>Personal considerations:</p> <ul style="list-style-type: none"> - the <u>effectiveness</u> of regulation <u>on external lighting (in view of the effectiveness of voluntary charter)</u> 	<p>Stakeholders' concerns:</p> <ol style="list-style-type: none"> (1) <u>Need/ urgency</u>; (2) <u>Way & Pace</u>; (3) <u>Impacts</u> of regulating external lighting
<p><u>Some firms that manufactured lights and commercial signs</u></p> <p>Part 3 (16:04 - 16:08)</p>	<p>For / Neutral/ Against</p>	<p>Personal considerations:</p> <p><u>legislation to control city lights would have adverse effect on various businesses</u></p> <p>(Sustainability of businesses/ income of business)</p>	<p>Stakeholders' concerns:</p> <ol style="list-style-type: none"> (1) <u>Need/ urgency</u>; (2) <u>Way & Pace</u>; (3) <u>Impacts</u> of regulating external lighting
<p><u>Some firms that manufactured lights and commercial signs</u></p> <p>Part 3 (16:08 - 16:15) & William Tam, Manager of Lighting Company</p> <p>Part 3 (16:15 - 17:24)</p>	<p>For / Neutral/ Against</p>	<p>Personal considerations:</p> <ul style="list-style-type: none"> - Supported regulating light pollution, but doubted the <u>effectiveness</u> of <u>voluntary observance</u> - <u>Clients' orders / preferences</u> are more important than their own due to cut-throat competition 	<p>Stakeholders' concerns:</p> <ol style="list-style-type: none"> (1) <u>Need/ urgency</u>; (2) <u>Way & Pace</u>; (3) <u>Impacts</u> of regulating external lighting
<p><u>Business sector - firms that installed lights and commercial signs</u></p> <p>Part 3 (17:24 - 18:00)</p>	<p>For / Neutral/ Against</p>	<p>Personal considerations:</p> <ul style="list-style-type: none"> - <u>environmental protection</u> - <u>Hotel's image</u> - <u>Gradual legislation and control</u> 	<p>Stakeholders' concerns:</p> <ol style="list-style-type: none"> (1) <u>Need/ urgency</u>; (2) <u>Way & Pace</u>; (3) <u>Impacts</u> of regulating external lighting

(c) From 2(a) and 2(b), identify one pair of stakeholders who may be in conflict on the issue of regulating external lighting through legislation. Analyse the point and reason(s) of conflict behind.

Advanced

Stakeholder A	Point of Conflict	Stakeholder B
<p>STEP (1a) - Stakeholder A</p> <p>Firms that manufactured lights and commercial signs</p> <p>support / oppose</p> <p>↑ led to</p> <p>STEP (1b) – Concern (and value) of Stakeholder A</p> <p><i>Operating cost... or Effectiveness of advertising and their long term brand image and revenue → (1)</i></p> <p><i>Limited impacts of external lighting on citizens' health → (3)</i></p>	<p>STEP (2a) Point of Conflict (Aspect & Issue):</p> <p>(1) <u>Need/ urgency:</u></p> <p>(2) <u>Way & Pace:</u></p> <p>(3) <u>Impacts</u> of regulating external lighting</p> <p>STEP (2b) Reason of Conflict:</p> <p>(4) <u>Conflict of interests :</u></p> <p>(5) <u>Conflict of views due to incompatible values:</u></p> <p>(6) <u>Differences in understanding/ expectation.</u></p> <p><i>While A believes <u>that there is no need to regulate external lighting.</u></i></p> <p><i>B believes that <u>external lighting should be regulated (as soon as possible).</u></i></p>	<p>STEP (1a) - Stakeholder B</p> <p><u>Local residents affected by light pollution</u></p> <p><u>(AND/ OR Chairman of Hong Kong Astronomical Society)</u></p> <p>support / oppose</p> <p>↑ led to</p> <p>STEP (1b) – Concern (and value) of Stakeholder B</p> <p><i>Personal sleeping quality and health → (1)</i></p> <p><i>Great impacts of external lighting on their health → (3)</i></p>



(d) With reference to 2(a) - (c), identify **THREE possible barriers** to achieving consensus among major stakeholders on the issue of regulating external lighting in Hong Kong.

Hints:

Advanced

“Who + When + What” should be involved in regulating the external lighting in Hong Kong

<p>Who</p> <ul style="list-style-type: none"> - Did any of the stakeholders oppose regulations on external lighting in the consultation? Why? - What does that mean to the government? 	<p>It is difficult, if ever possible, to reach a consensus among different major stakeholders as they were trying to protect their own vested interest.</p> <ul style="list-style-type: none"> - Business was concerned about the financial consequences of regulating external lighting (e.g. the effectiveness of promotion of their business). - The government was concerned about maintaining a fair regulation while minimising its regulations and impacts on private sectors.
<p>When</p> <ul style="list-style-type: none"> - How long did it take the government to suggest the regulation proposed by its consultation on the regulation on external lighting? Do you think it is long? Why? 	<p>It is difficult and takes a long time to reach a consensus among different stakeholders on the necessity and ways of regulations on light pollution.</p> <p>Part 2 (8:15 – 10:54) Difficult to reach consensus within internal discussion (task force on external lighting) and took 2 years or the government to put forward the voluntary charter on xternal lighting.</p>
<p>What</p> <ul style="list-style-type: none"> - What the methods of regulating external lighting difficulties were once considered? - Why were they dismissed? 	<p>It is difficult to set a strategy/ policy with details that can effectively solve the problem while catering concerns from all vested interests.</p> <ul style="list-style-type: none"> - (e.g. zoning method vs. restrictions on commercial signage vs. legislation vs. voluntary action)

3. From questions 1 and 2, what are the barriers to achieving consensus among major stakeholders in general?

Types of Barriers	Possible causes leading to the barrier
<p>Initiation:</p> <p><u>Difficult to find a common ground to engage major stakeholders in dialogues</u></p> <p>due to: different understanding/ expectation towards a policy/ an ordinance among them</p>	<ul style="list-style-type: none"> ● the necessity of regulation [WHY] ● the pace/ urgency of regulation [WHEN]

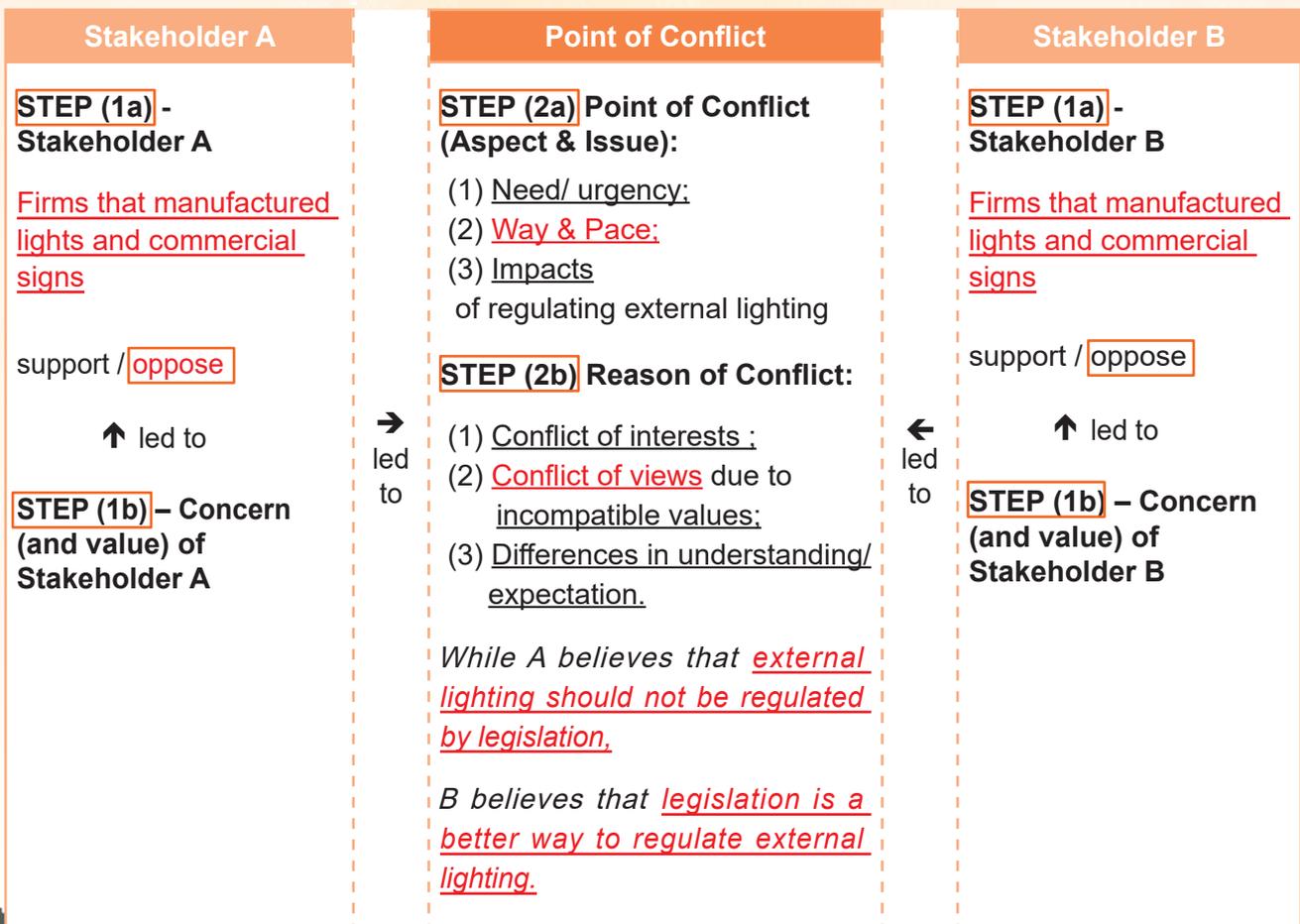


<p>Process:</p> <p><u>Difficult to reach a consensus on the direction/ approach of policy because different major stakeholders will try to protect their own vested interest</u></p> <p>due to: the differences in the extent of influences of a policy/ an ordinance on them.</p>	<ul style="list-style-type: none"> ● the way/ mechanism of regulation [HOW] ● the scope (e.g. targets and time) of regulation [WHO + WHERE] ● Cost of a solution to be shared [HOW MUCH]
<p>Conclusion:</p> <p><u>Difficult to reach a consensus on the technicality/ details of a policy/ an ordinance</u></p> <p>due to: the limitation of a policy/ ordinance in meeting <u>all stakeholders' expectations without compromise.</u></p>	

(P.243) Reference answers for 2(c) of Appendix 3

2.(c) Other possible pairs of stakeholders who may be in conflict on the issue of regulating external lighting through legislation. Analyse the point and reason(s) of conflict behind.

Advanced



STEP (1a) - Stakeholder A

Business sector
- firms that installed lights and commercial signs

support / oppose

↑ led to

Stakeholder A

STEP (1b) - Concern (and value) of Stakeholder A

STEP (2a) Point of Conflict (Aspect & Issue):

- (1) Need/ urgency:
- (2) Way & Pace:
- (3) Impacts of regulating external lighting

led to

led to

Point of Conflict

STEP (2b) Reason of Conflict:

- (1) Conflict of interests :
- (2) Conflict of views due to incompatible values:
- (3) Differences in understanding/ expectation.

While A prefers to regulate external lighting gradually,

B prefers to regulate it as soon as possible.

STEP (1a) - Stakeholder B

support / oppose

↑ led to

Stakeholder B

STEP (1b) – Concern (and value) of Stakeholder B

