



EFFECTIVE NUCLEAR SAFETY GOVERNANCE FOR HONG KONG AND GUANGDONG CHINA: A STAKEHOLDER TRUST-BASED MODEL

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Outline

1. Why Effective Nuclear Safety Governance?
2. Attitudes towards nuclear power in HK and China
3. Public trust in HK & Chinese government
4. Nuclear Safety Governance in HK
5. Stakeholder Trust-based Model

1. Why Effective Nuclear Safety Governance in HK?

Background

Daya Bay Nuclear Power Station

- Joint venture between Hong Kong Nuclear Investment Co. Ltd (HKNIC) & Guangdong Nuclear Investment Co. Ltd (GNIC)
- 1987-Construction started
- 1994-Operation started
- 70% power output supplying Hong Kong
- Meeting 23% of local electricity demand
- 50 km from HK's city centre



Ling Ao Nuclear Power Station (Phase I & Phase II)
 4×1000MW

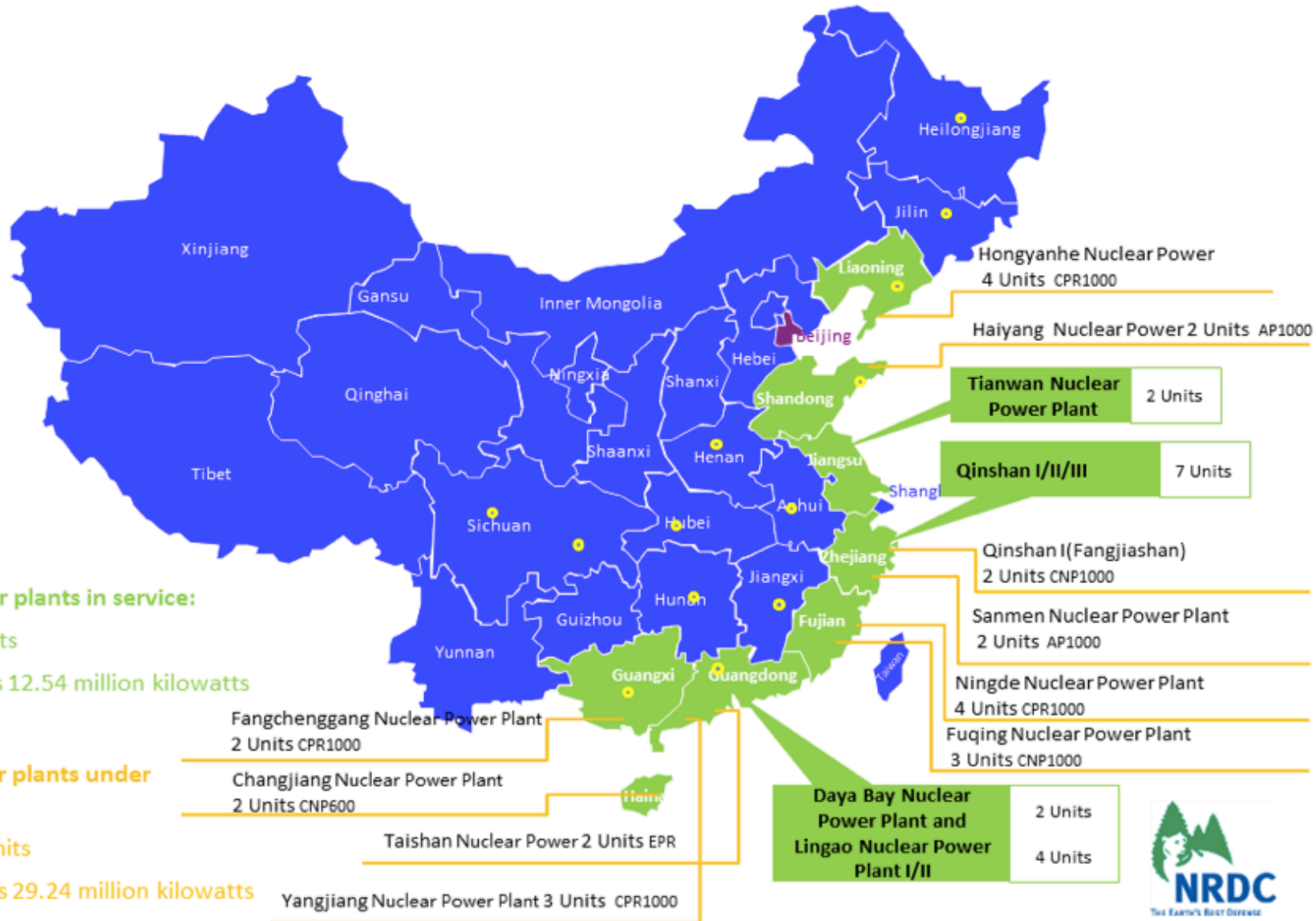
Daya Bay Nuclear Power Station
 2×1000MW

Tai Shan Nuclear Power Station
 2×1750MW & 2×1750MW

Yang Jiang Nuclear Power Station
 1×1000MW & 3×1000MW & 2×1000MW

- ⊙ In Operation
- ⦿ Under Construction
- To be Constructed

Nuclear Power Plant Projects in GD and China



Distance of Nuclear Power Stations from HK



Nuclear Power Plants Worldwide

1. 370 nuclear reactors in 30 countries providing 13% of world's electricity
2. 6 nuclear power stations with 18 power plants are in operation in China (by March, 2014)
3. 22 nuclear power plants are in operation & construction in Guangdong Province (by March, 2014)
4. Plans for 40 more by 2030 for China

Source: * Roulstone, T., Cambridge University Network 2012 Annual Conference;

** Baidu Baike, Yang Jiang Nuclear Power Station <http://baike.baidu.com/view/457113.htm?fr=aladdin>

Leakage of Radioactive Water at Fukushima Nuclear Power Plants



Radiation from leaking water at reactor 2 Fukushima Daiichi nuclear plant has been measured at 1 Sievert (Sv) per hour. 1 Sv will induce radiation sickness, BBC news, March 27, 2011



New radioactive water leak found at Japan's Fukushima plant, Rianovosti, April 11, 2013



Tank leaks 300 tons of radioactive water at Fukushima plant, The Asahi Shimbun, August 20, 2013,



An extra 300 to 400 tonnes of groundwater becomes contaminated beneath the site each day, South China Morning Post, May 22, 2014

Impact of Radioactive Water Leakage at Fukushima Nuclear Power Plants



Radiation leakage from Fukushima nuclear power plant is a concern for Japanese fisheries, The Telegraph, Mar 28, 2011



Radiation levels in fish off Japan's east coast could indicate the Fukushima nuclear power plant, crippled by the disaster, is still leaking, Cosmos, October 26, 2012



Fish had absorbed a large quantity of radioactive cesium shortly after the onset nuclear disaster, Enformable Nuclear News, June 13, 2013,



Fukushima radiation hits British Columbia west coast, Csglobe, March 14, 2014

Nuclear Safety

1. Many power plant projects are under construction in Guangdong province and other parts of China.
 - Four power stations in GD province currently under operation now or in near future – DayaBay (50km); Ling Ao (50km); Yang Jiang (200km, by 2014); Tai Shan (130km, by 2015); .
2. Nuclear Safety (NS) Governance is critical to ensure HK people's safety
 - Recent Fukushima crisis reveals that human errors and unforeseeable events can have devastating effect – blackout
 - This can occur even with more sophisticated nuclear models

2. ATTITUDES TOWARDS NUCLEAR POWER & GOVERNMENT

Attitudes Towards Nuclear Power Across Countries

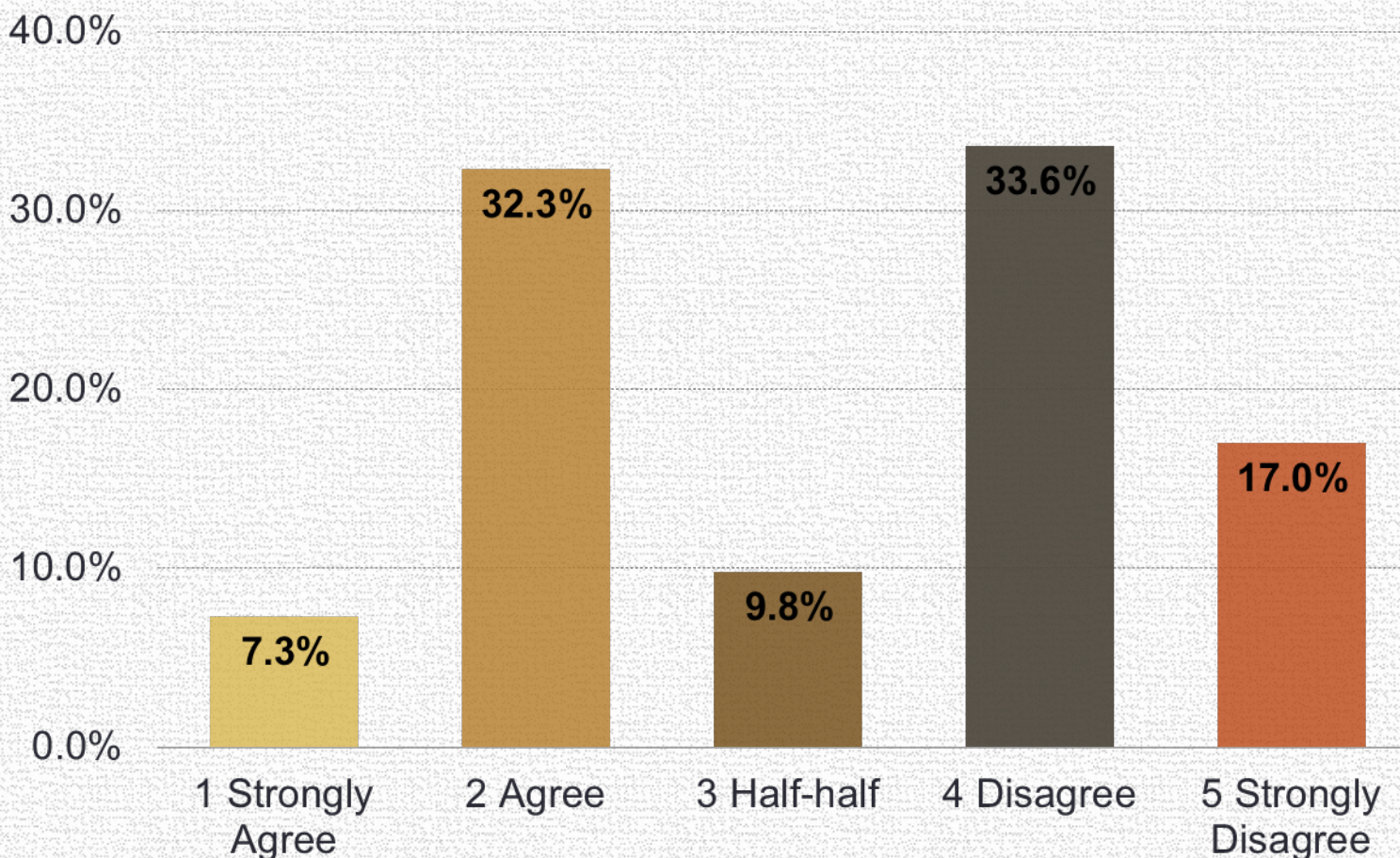
- [Italy] Prati and Zani (2012):
 - Major nuclear accidents may decrease public trust in nuclear power, increases pro-environmental beliefs and marginally increases altruism because they are ‘the basis of public attitudes toward nuclear power’.
- [Switzerland] Siegrist and Visschers (2012):
 - The accident had a negative impact on the acceptance of nuclear power. However, the mean changes were moderate.
- [Turkey] Sahin (2011):
 - Antinuclear sentiment has increased since Fukushima.
- [Russia] Khlopkov (2011):
 - Considering the scale of the nuclear industry in Russia and the lack of an alternative that could replace nuclear energy, one can hardly expect Fukushima to exert a significant influence on Russia’s strategic plans in the field of nuclear energy over the short and medium term.
- [USA] Ehreiser (2011):
 - There has been a shift in public opinion against nuclear energy since the nuclear disaster took place in Japan. However, civil society entities such as environmental groups and NGOs opposed to nuclear energy are extremely weak. Further, the debates over the budget and the fragile economic recovery dominate the discussion

Attitudes Towards Nuclear Power across Countries

- The Fukushima disaster has shaken people's confidence in the use of nuclear power across countries.
- However, due to the lack of viable alternatives and the need for development, it is clear that many countries won't abandon nuclear power plants.
- So what about HK?

Nuclear as Energy Fuel Mix

There's a view that Hong Kong needs nuclear power as a mix of energy sources to ensure the reliable supply of electricity. Do you agree with this statement? (A0)



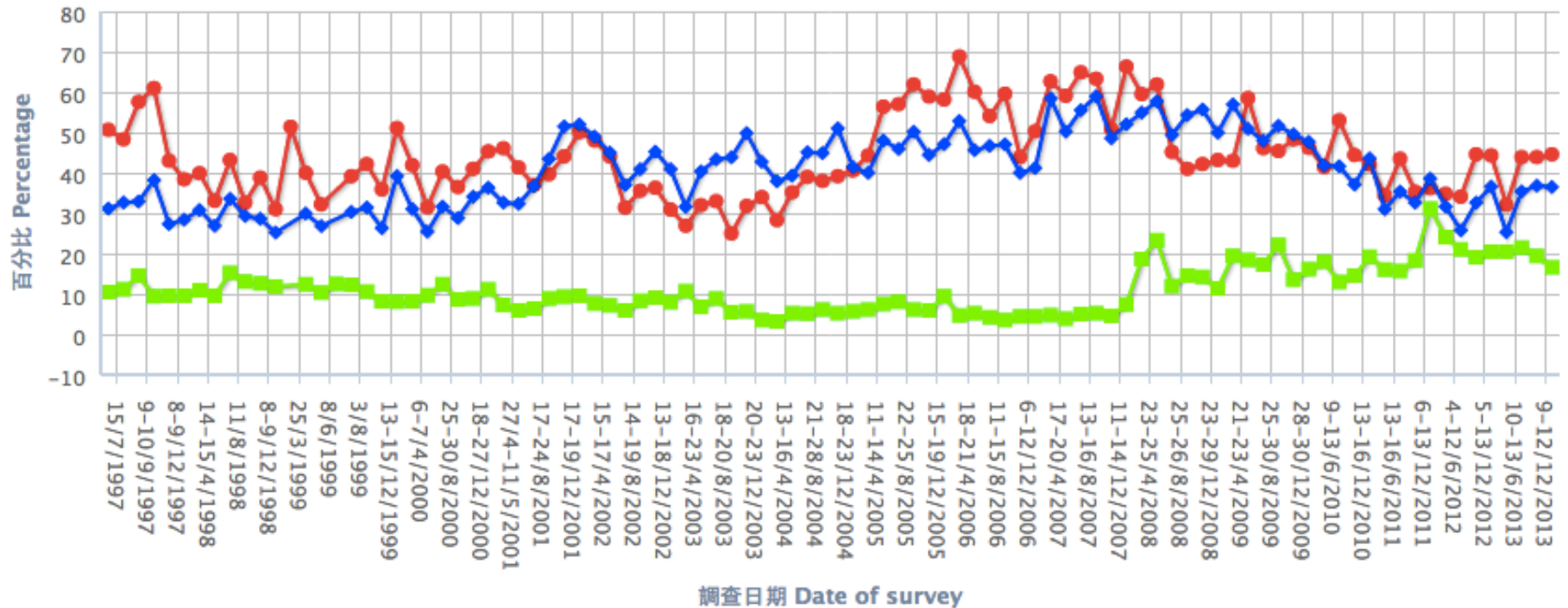
Trust in the HK Gov't and Beijing Central Gov't Dropping Since 2008

市民對香港特區政府、北京中央政府及台灣政府的信任程度 – 綜合圖表 (按次計算)

People's Trust in the HKSAR Government, Beijing Central Government
and Taiwan Government – Combined Charts (per poll)

(7/1997 – 3/2014)

● 信任香港特區政府 ● 信任北京中央政府 ● 信任台灣政府
Trust in the HKSAR Government Trust in the Beijing Central Government Trust in the Taiwan Government



Summary

- The above shows that
 - There is a growing stakeholder concern (worry) about nuclear risk and safety in the wake of Fukushima crisis.
 - There is a low level of public trust towards the HK and Chinese government before and after the Fukushima crisis, although it is slightly improving after 2011.
- In case of nuclear disaster in Guangdong, there could be chaos due to low trust towards the nuclear safety governance.
 - This could be devastating to both HK and China.
 - **WHAT CAN WE DO?**
- There is an urgent need to address the issue of nuclear safety and build stakeholder trust in nuclear safety decision-making, including contingency planning.



3. Nuclear Safety Contingency Governance in Hong Kong

Daya Bay Contingency Plan (DBCP) by HKSARG

- **OLD Daya Bay Contingency Plan (DBCP) first developed in 1994**
- **1987 Consultancy Study by the UK Atomic Energy Authority**
- **Windscale (1957), Three Mile Island (1979) & Chernobyl (1986) experience**
- **Risk assessment for HK**
- **Following international standards**
- **Development of the DBCP by the Security Bureau**
- **Development of monitoring, assessment & response capabilities by departments**



 **Daya Bay Contingency Plan**
The Government of the Hong Kong Special Administrative Region

 **Daya Bay Contingency Plan**

 **Dose Calculator**

 **Dose Converter**

 **DBCP Download**

Daya Bay Contingency Plan (DBCPC) by HKSARG

- DBCP reviewed, revised and issued in March 2011
- Enhancements introduced with reference to key learning from Fukushima incidents, international standards and overseas practices
 - Government structure
 - Radiation monitoring
 - Notification arrangements
 - Accident consequence assessments
 - Public information and communication
 - Monitoring of persons within HK
 - Boundary control measures on inbound travelers and goods
 - Cross Boundary & External liaison, etc.
- DBCP Website launched for public communication
<http://www.dbcp.gov.hk/eng/dbcp/download.htm>



Daya Bay Contingency Plan
The Government of the Hong Kong Special Administrative Region

Daya Bay Contingency Plan

Dose Calculator

Dose Converter

DBCPC Download

Daya Bay Contingency Plan (DBCP) by HKSARG

Challenge 1: Emergency Response Structure – Interdepartmental Coordination

- Steered by senior officials
- Advised by professional departments
- Central coordination
- Operational departments

Challenge 2: Public Information – Not Easily Understood by Layman

- Media strategy
- Information Policy Committee (convened by DIS)
- Combined Information Centre (ISD plus Police Public Relations Bureau)
- Press Briefing Centre
- Overseas information



Daya Bay Contingency Plan

The Government of the Hong Kong Special Administrative Region

Daya Bay
Contingency Plan



Dose
Calculator



Dose
Convertor



DBCP
Download

Daya Bay Contingency Plan (DBCP) by HKSARG

Challenge 3: Radiation Monitoring Limited to Local Only

- **Environmental Radiation Monitoring**
 - Testing of local environmental samples
- **Online Water Contamination Monitoring**
 - Monitoring of water from Guangdong

Challenge 4: Information Transfer Across the Border

- **Notification to HKSAR Government of Nuclear Incidents**
 - By Guangdong Authorities
 - By International Atomic Energy Agency
 - By CLP Power (Daya Bay Nuclear Plants)



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Gaps

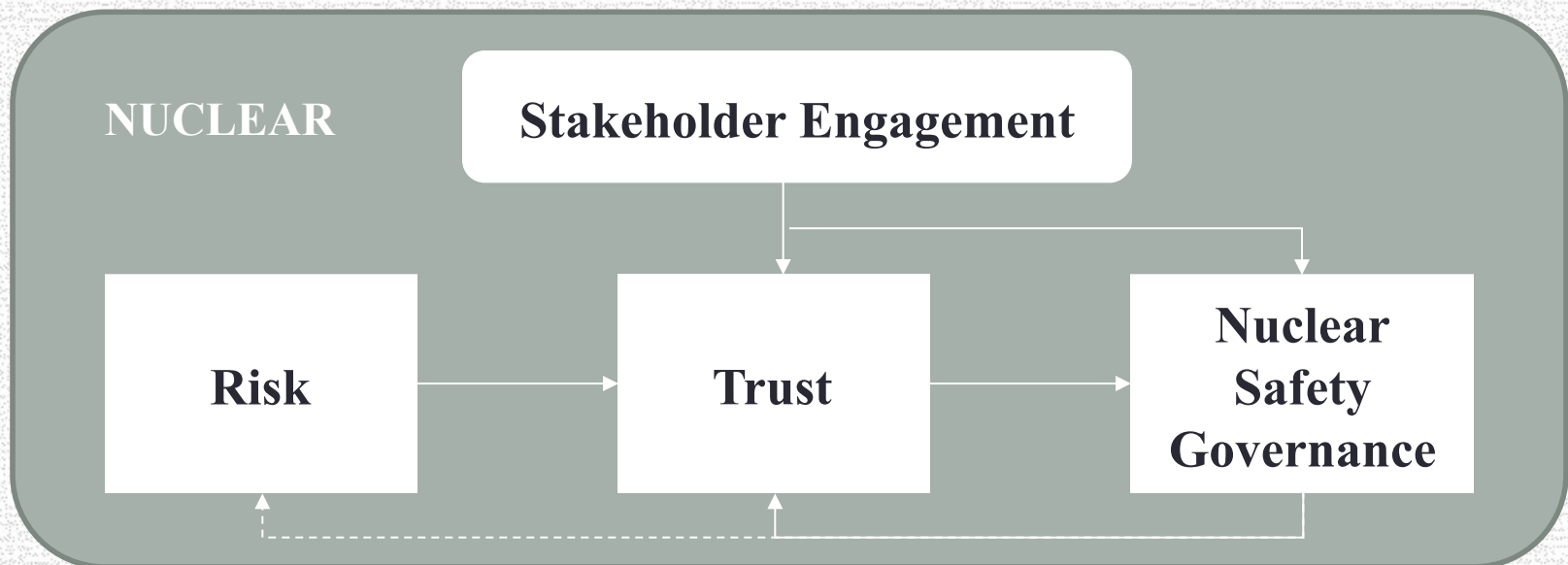
- Planning and emergency response for nuclear safety governance in HK:
- Top down governance
- Relatively low flexibility, limited to local radiation monitoring
- Inter-departmental coordination and collaboration
- Cross-border coordination and collaboration
- Relatively low stakeholder engagement except the experts
 - Most citizens are not aware of such plans, nor being involved in the planning exercise.
 - Only the government departments are involved in planning and emergency response exercises.
- TRUST DEFICIT: urgent need for trust-building

3. Stakeholder Trust-based Model

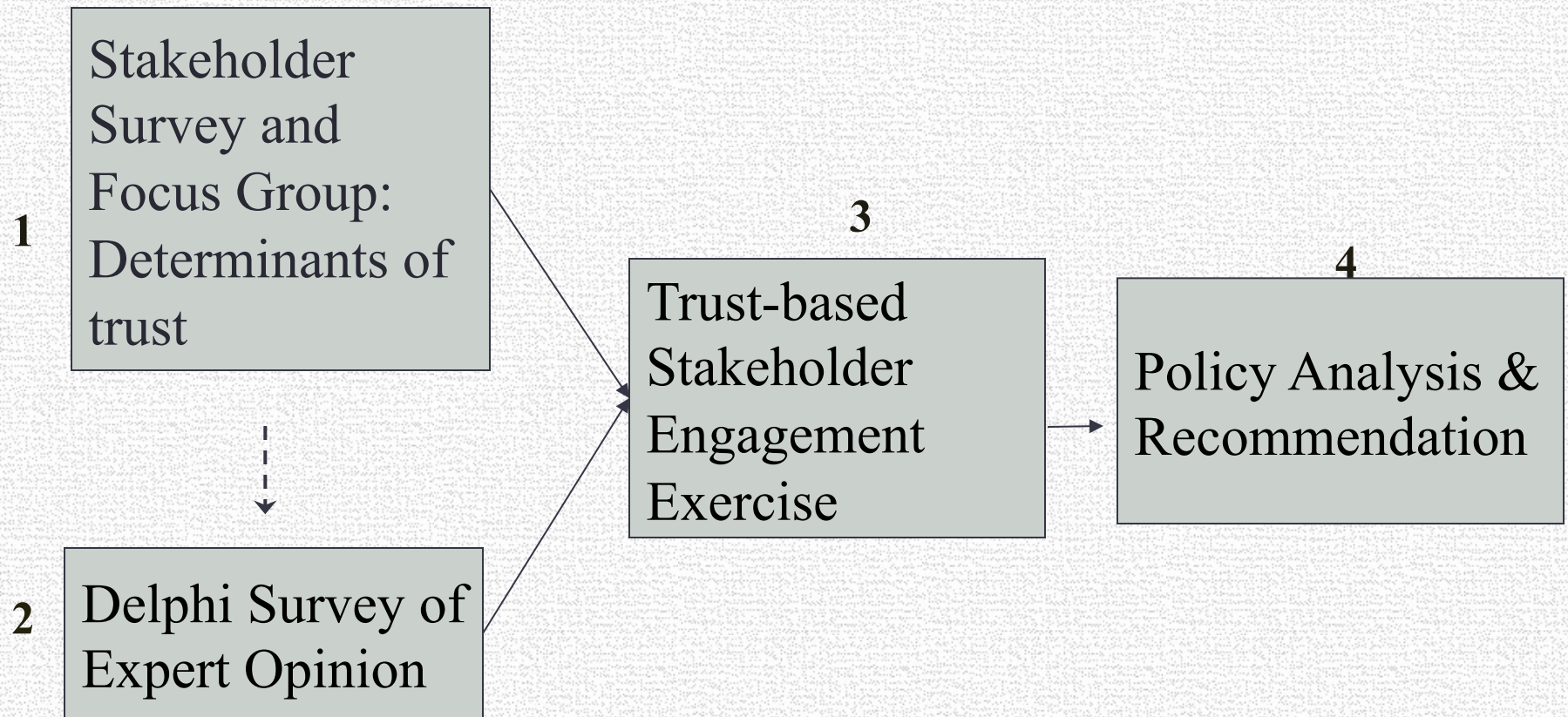
Nuclear Safety Governance

- The process of governing and managing nuclear risk by building trust in a highly complex and uncertain policy arena that places the meaningful involvement of stakeholders at its core.

Effective Nuclear Safety Governance: A Stakeholder Trust-based Model



Project Methodology



Project Objectives

1. Identify factors determining stakeholder trust in nuclear safety (contingency) governance for HK
2. Set the priorities of nuclear safety (contingency) issues for trust-building through a Delphi survey conducted among international, local and Chinese experts.
3. Solicit views and build consensus among policy makers and nuclear safety experts, together with other key stakeholders in HK and China.
4. Based on (1)-(3), recommend a trust-based NS contingency plan to the HK and Chinese government to facilitate effective NS governance.

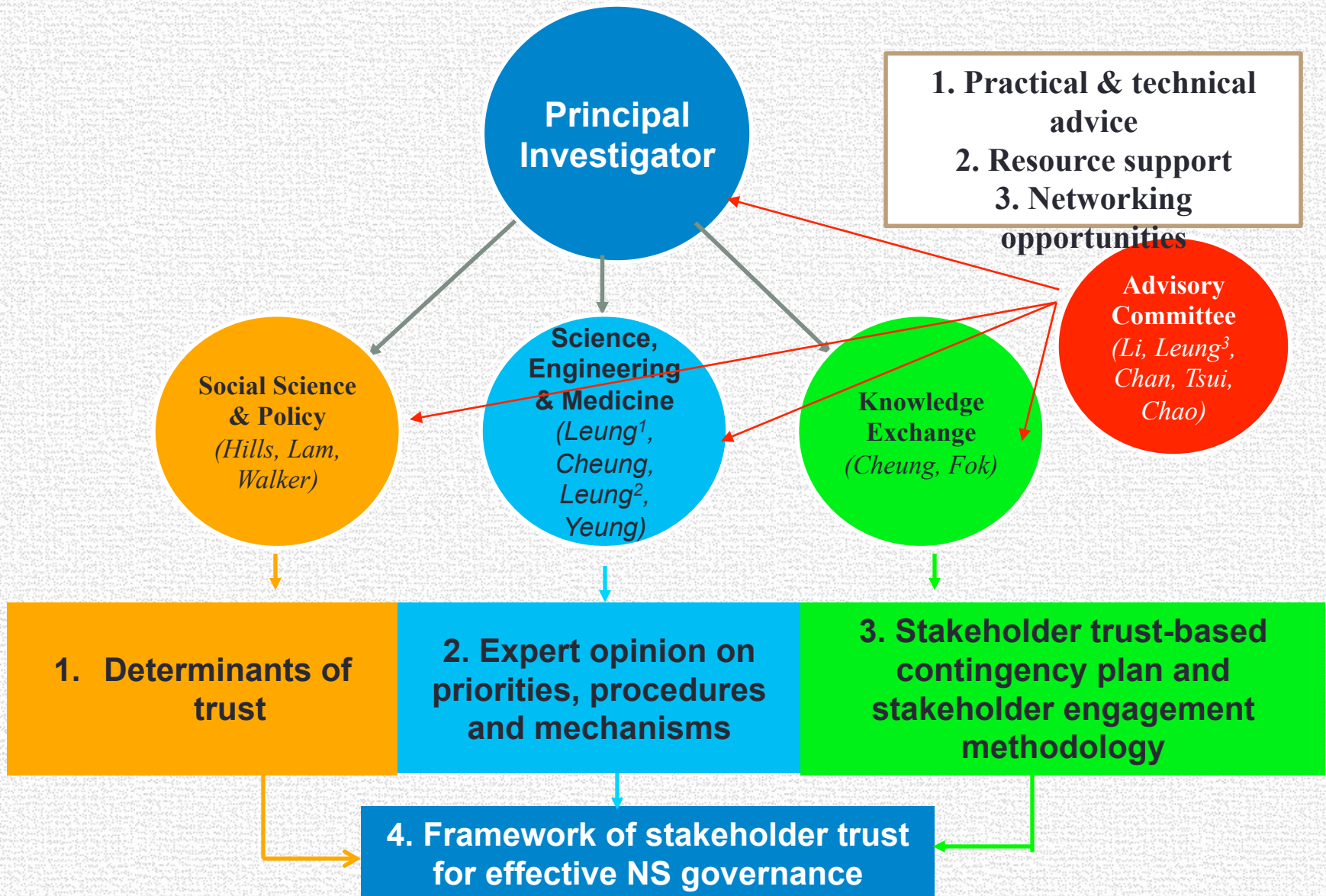
Significance

- A novel 3-stage methodology to engage stakeholders and build stakeholder trust in nuclear safety governance
- Develop a stakeholder trust-based framework for nuclear safety governance for HK and Guangdong
 - Through the examination of the determinants of trust in TWO new arenas:
 - (i) Nuclear safety & (ii) Cross-border governance
- Extend the stakeholder trust-based model to related public policy areas (e.g. new energy development)

Characteristics of the Project

- Stakeholder engagement trust-based model for HK
- Highly **interdisciplinary** policy research
- Provide evidence to contingency planning in relation to:
 1. Public health,
 2. Food and water safety, and
 3. Cross-border collaboration

Synergy of Interdisciplinary Team



Acknowledgments

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THANK YOU!
Please send your comments to:

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