

Exchange lessons learned and best practices on analysis and assessment of positive and negative impacts of the implementation of response measures by Parties and report to the Forum in accordance with paragraph 4(j) of the annex to decision 7 CMA.1



## SG's KEY MITIGATION MEASURES

- Methodologies and tools to assess the implications of response measures
- Capacity building for developing countries
- Case studies, awareness creation



### Buildings

- Green Mark Certification for all new buildings and existing buildings when retrofitted
- Improve energy efficiency of tenanted spaces



### Households

- Mandatory Energy Labelling Scheme (MELS)
- Minimum Energy Performance Standards (MEPS)
- Smart home technologies



### Power generation

- Adopt more efficient technologies
- Increase deployment of solar PVs

### Industry

- Improve energy efficiency
- Encourage new co-generation plants

### Transport

- Increase public transport modal share
- Improve fuel efficiency of private vehicles
- Test-bed electric vehicles

### Waste and water

- Increase overall recycling rate
- Reduce plastics incineration
- Improve efficiency of desalination and used water treatment

KCI


it was the best of times, ~~it was the worst of times,~~  
it was the age of wisdom, ~~it was the age of foolishness,~~  
it was the epoch of belief, ~~it was the epoch of incredulity,~~  
it was the season of light, ~~it was the season of darkness,~~  
it was the spring of hope, ~~it was the winter of despair,~~  
we had everything before us, ~~we had nothing before us,~~  
we were all going direct to heaven, ~~we were going the other way~~

1001 Arabian Nights


a Whole New World; a new fantastic point of view

## CONTEXTUALISING THE ISSUE

Mitigating climate change through cycles of NDCs and addressing the implications of implementation of response measures are joined at the hip

- ❑ **What?** Holding the increase in global average temperature to well below 2 degrees above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 degrees
- 
- ❑ **How?** Parties to communicate NDCs every 5 years, representing a progression beyond current NDCs

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- ❑ **What?** Parties affected not only climate change, but also by the economic and social implications of the measures (in NDCs) taken in response to it. These impacts may become more pronounced with more ambitious NDCs
- 
- ❑ **How?** Katowice decisions to address the implications of measures (in NDCs) taken in response to climate change. Good start, but start of the journey

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- ❑ **Problem Statement:** What should be expected from Forum and KCI to effectively address adverse implications of the implementation of response measures such that parties are incentivized and able to meet the objectives of the Convention and the Paris Agreement

# Structure of presentation

- 1) Learning Points
- 2) National Circumstances - Snapshot of Singapore's context, constraints, contributions
- 3) Responding to constraints, at the national level - Needing to adapt and diversify
- 4) Governance of Response Measures – Best practices
- 5) Elements for further work

# 1. Learning Points

As mitigating climate change through NDCs and addressing the implications of response measures are related, principles governing NDCs are applicable to the latter

## Learning Points

- Precaution
- Cost-effectiveness
- Doing no harm
- Policy neutrality with regard to choice of mitigation actions
- The exceptionally broad scope of climate regime - encompassing not only environmental protection but also economic and development policies
- Sustainable development
- Supportive and open international economic system
- Paris Agreement is founded on national circumstances

# Recognition of 3 Cs

## Learning Points

### Context

- Opportunities and challenges as parties make transition to low emissions pathway.
- Opportunities provided by clean energy technologies and industries.
- For many, their socio-economic context might require the greatest focus to be applied on poverty eradication.
- For other parties, their industrial structure might be dependent on some specific activities.

### Constraints

- In varying degrees, geographic, natural, structural constraints limit parties' ability to adopt mitigation actions.
- Small islands face difficulties in switching to alternatives to fossil fuels due to lack of renewable energy options.
- Some countries may be economically dependent on income generated from fossil fuels constraining a switch.

### Contributions

- Notwithstanding context and constraints, parties have made contributions to reduce their emissions and to enhance their adaptation.
- Some parties have taken early actions to reduce emissions.
- This could limit their potential for future actions – arising from their context and constraints.



**No two country are alike. National circumstances differ**

**All parties will be affected in the carbon constrained world. Impact become more pronounced as parties implement current and successive NDCs**

**The impact of response measures is not limited to national boundaries**

**Economic diversification is necessary to build resilience, need to be tailored to the unique national circumstances of each country. Parallel just transition of the workforce through re-skilling, up-skilling.**

**Programmes for economic diversification has to be undertaken at the national level. International cooperation has a facilitative role in economic diversification initiatives**



## National Circumstances Matter

- ➔ This Agreement will be implemented ...in the light of different national circumstances (Art 2.2)
- ➔ Each party's successive NDC will represent a progression beyond the party's current NDC... in the light of different national circumstances (Art 4.3)
- ➔ All parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies...in the light of different national circumstances (Art 4.19)

Everyone has agreed on the direction of travel so that the next battle is to speed up along that direction of travel. The strength of Paris is that it builds a broad highway and allows countries to choose their lane of choice

Christina Figueres  
Former Executive Secretary, UNFCCC

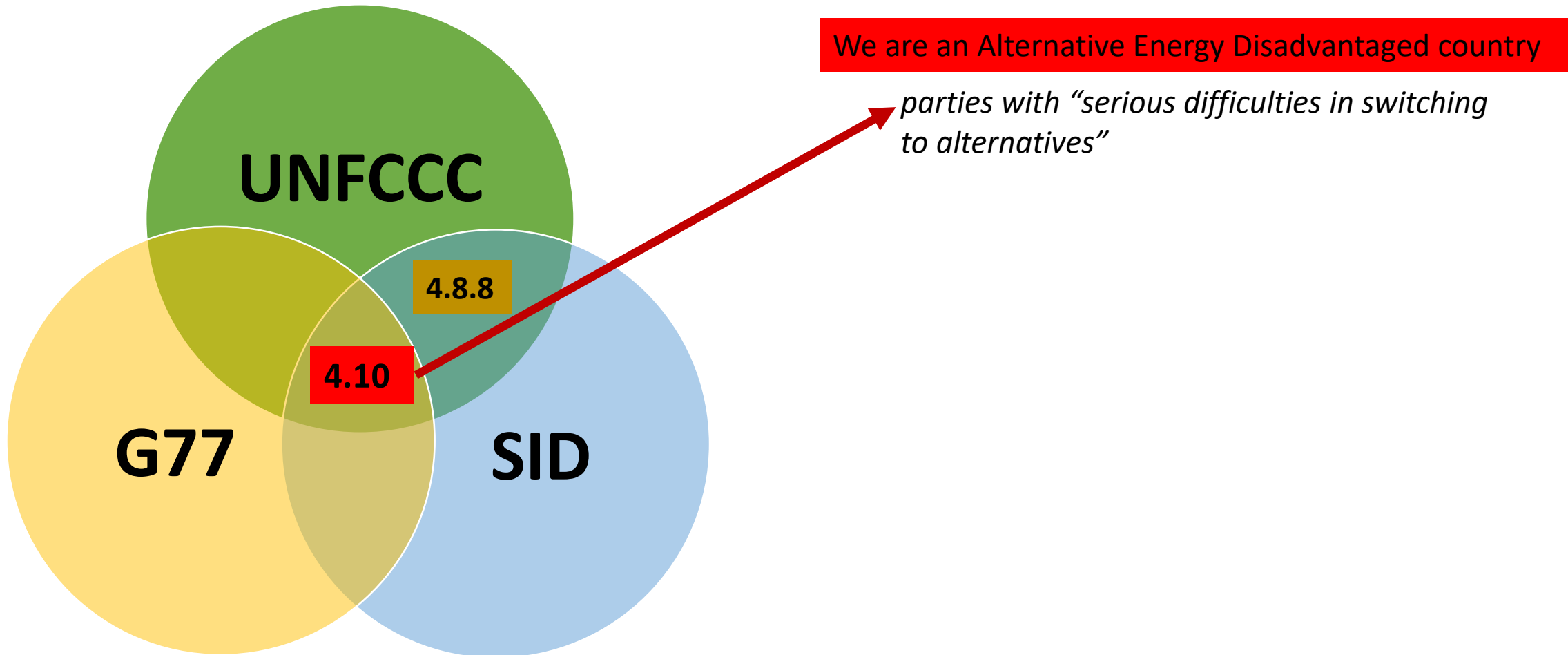
## **2. National Circumstances**

**Snapshot of Singapore's context and constraints**

# Singapore in the UNFCCC process

Context

- ❑ We are a SID
- ❑ We are a G77 member
- ❑ We are committed to the UNFCCC's multilateralism, and its objectives



# Singapore's national circumstances

## Context

### ❑ Small island city state



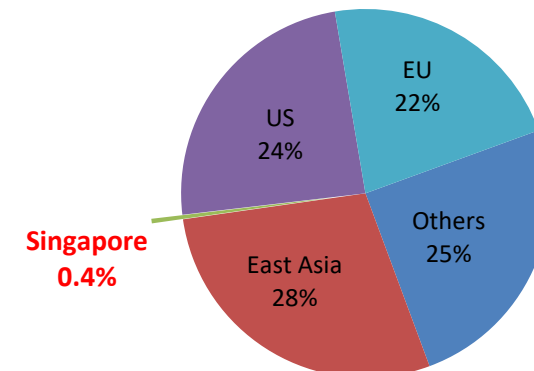
### With small physical geography

- Small size (750km<sup>2</sup>)
- Densely populated
- Flat (Highest point - 165m)
- Low lying (Mostly <15m above sea)
- No natural resources

### Confronting numerous constraints

- Land
- Manpower
- Water
- Food
- Energy

And a small share of global GDP (2018)

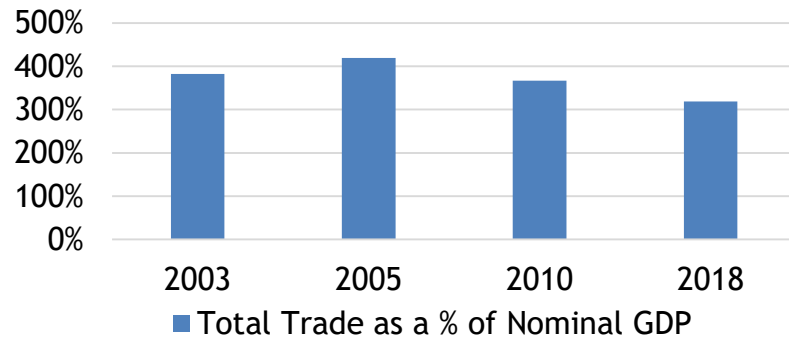


# Singapore's national circumstances

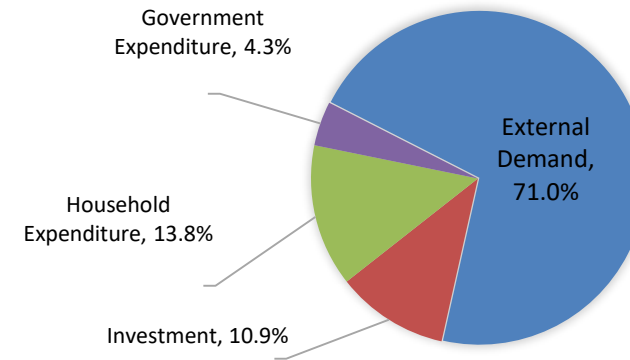
## Context

☐ An open economy connected to the world

### Highly dependent on international trade

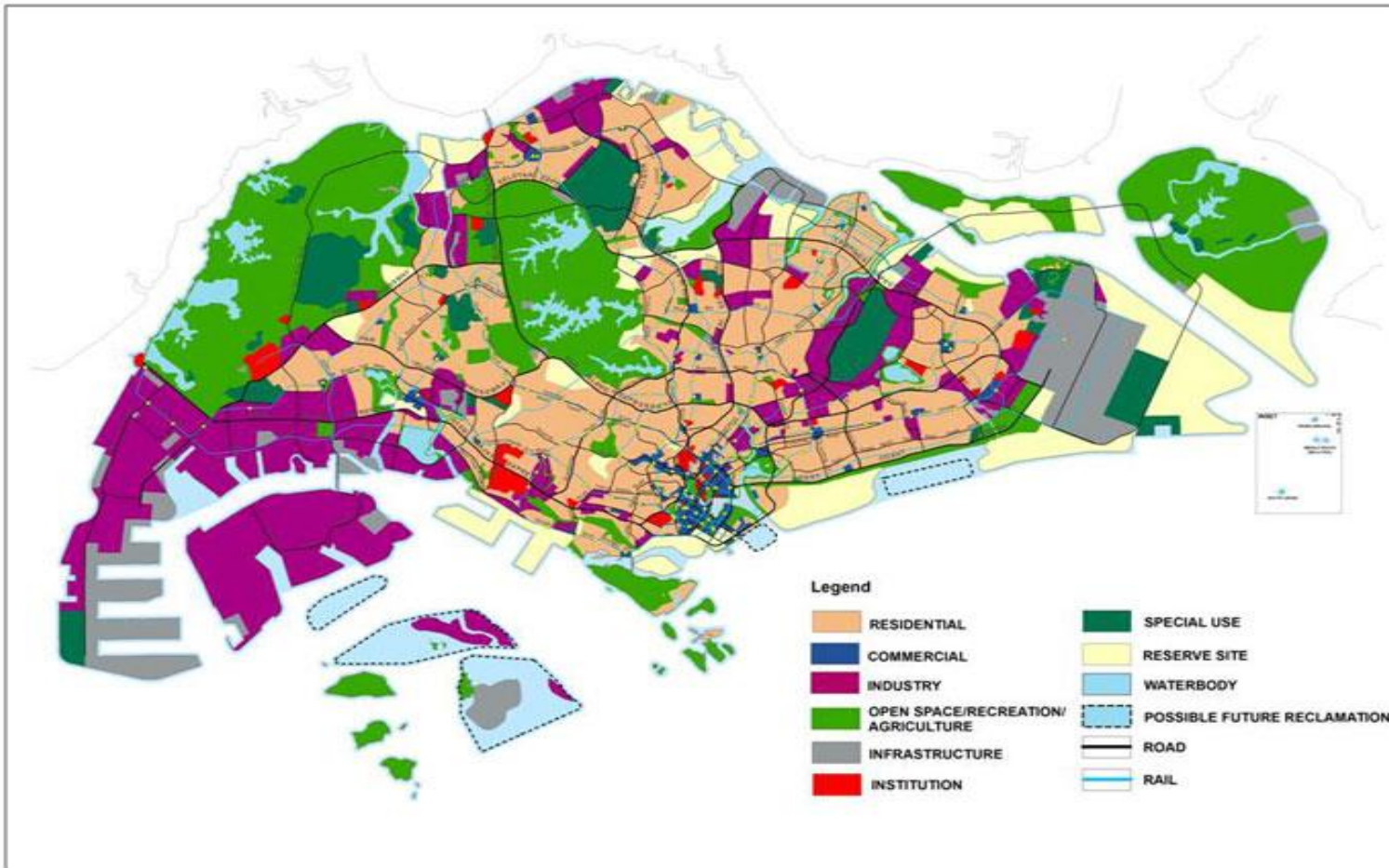


### External demand forming the largest component of Singapore's Total Demand (2018)

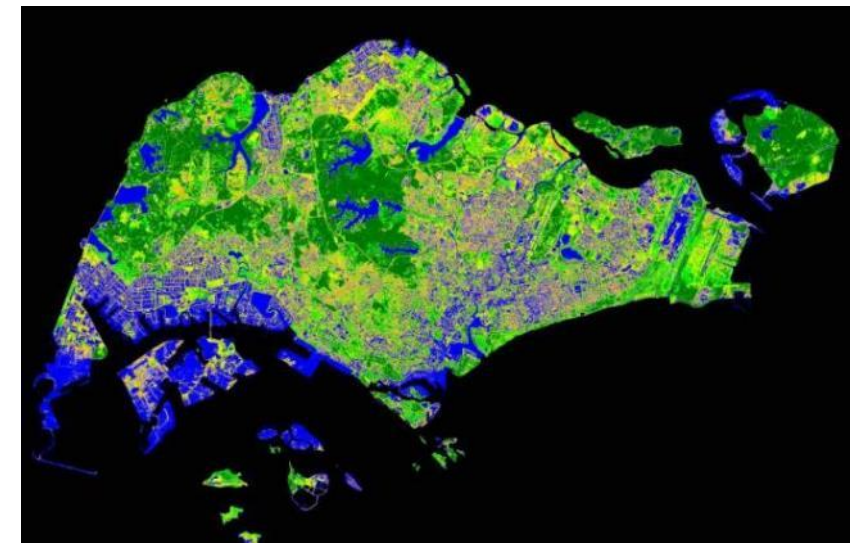


# Singapore's national circumstances

## □ Land constraint



- Limited land (750 km<sup>2</sup>) to meet many different uses
- There is limited land for economic activities: 80% of industrial land space is already allocated
- We also have to ensure that we have enough green areas (“City in a Garden”)



(Singapore's vegetation cover in green)

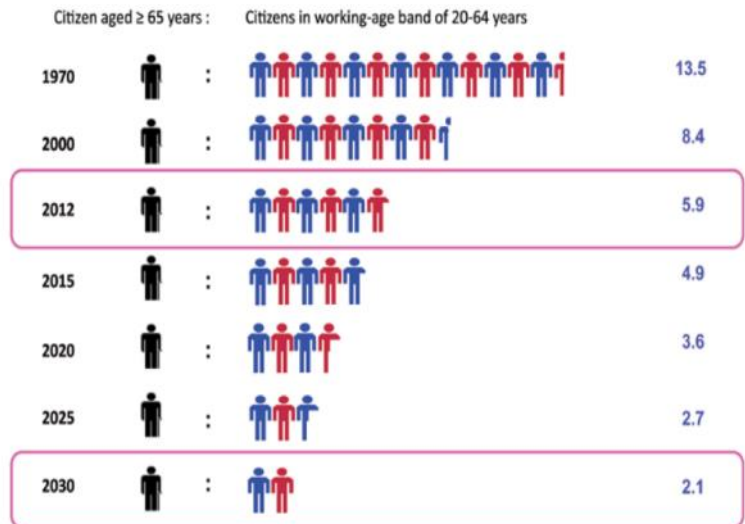
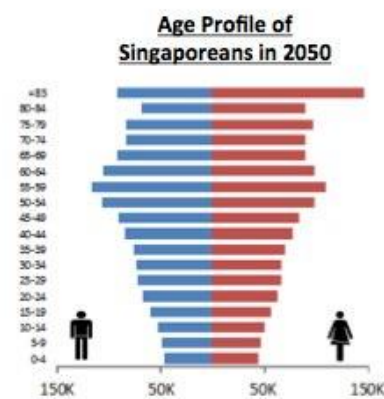
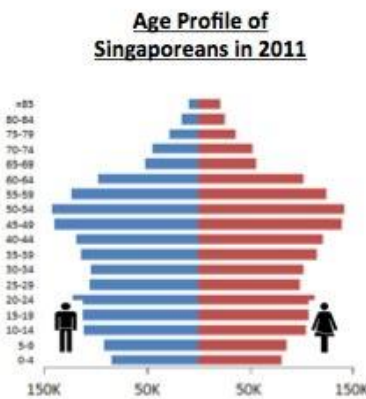
# Singapore's national circumstances

## Manpower constraint

- Singapore faces an aging population
- Our manpower needs cannot be met by the citizen workforce
- Reliance on foreign manpower has its limits



### Age Profile of Citizen Population



Assuming current birth rates and no immigration from 2013 onwards  
Source: DOS

# Singapore's national circumstances

## ❑ Food and Water Constraint

- No natural water supply, water imported from Malaysia
- Food security: almost all our food are imported
- Food and water constraints likely to be compounded with climate change







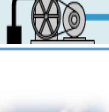




# Singapore's national circumstances

## ☐ Energy constraint

- ☐ Singapore relies on imported fuels, particularly natural gas, to meet our energy needs.
- ☐ Exposed to volatility of global energy markets and supply risks.
- ☐ We do not have the natural resources, land area and climatic conditions necessary for the large-scale deployment of renewable energy sources such as hydro, wind and geothermal energy. Solar is a possible renewable source, but there are space constraints – small land, dense population.

### Alternative-Energy Disadvantaged

Solar		<ul style="list-style-type: none"><li>• Intermittency is an issue. Limited land area for deployment as well.</li></ul>
Micro Wind Turbines		<ul style="list-style-type: none"><li>• Low wind speeds (&lt;3.3m/s) in Singapore with insufficient land.</li></ul>
Offshore Wind Turbines		<ul style="list-style-type: none"><li>• Not possible due to heavy marine traffic.</li></ul>
Tidal Energy		<ul style="list-style-type: none"><li>• Mean tidal range (1.7m) is too low.</li></ul>
Geothermal		<ul style="list-style-type: none"><li>• Geothermal potential for power generation is weak in Singapore.</li></ul>
Nuclear		<ul style="list-style-type: none"><li>• No carbon emission but has stringent land requirements. Safety and disposal of nuclear waste are issues.</li></ul>
Electricity Imports		<ul style="list-style-type: none"><li>• Frees up land but there are energy security concerns.</li></ul>

# Singapore's Contributions

- ❑ Made early policy choice to reduce GHG foot-print by switching from fuel oil to natural gas, the cleanest form of fossil fuel for electricity generation
- ❑ We price energy at market cost, without any subsidy to reflect resource scarcity and to promote judicious usage
- ❑ Despite significant geographic challenges, we are significantly increasing the deployment of solar photovoltaic systems
- ❑ 2020 pledge: Reduce GHG emissions by 16% below Business-As-Usual
- ❑ NDC: Reduce Emissions Intensity by 36% from 2005 levels by 2030, and stabilise emissions with the aim of peaking around 2030

- 3. Responding to constraints, at the national level**
  - we have to adapt, we need to diversify**

Responding to constraints  
We have to adapt, we need to diversify



Trade diversification

# Singapore's Network of FTAs

## 25 agreements in force with 37 Trading Partners



# Responding to constraints

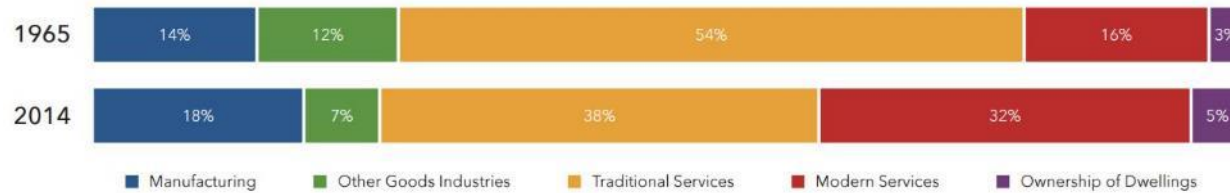
## We have to adapt, we need to diversify



# Economic (sectoral) diversification

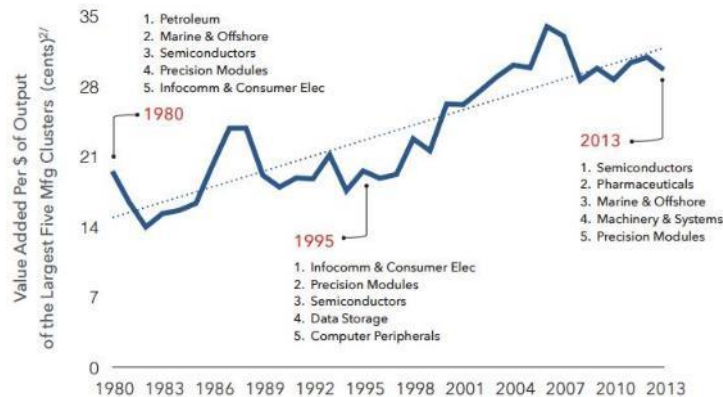
## Economic Structure (Share of Nominal GDP)

The domestic economy has evolved into a high-end manufacturing and modern services hub.

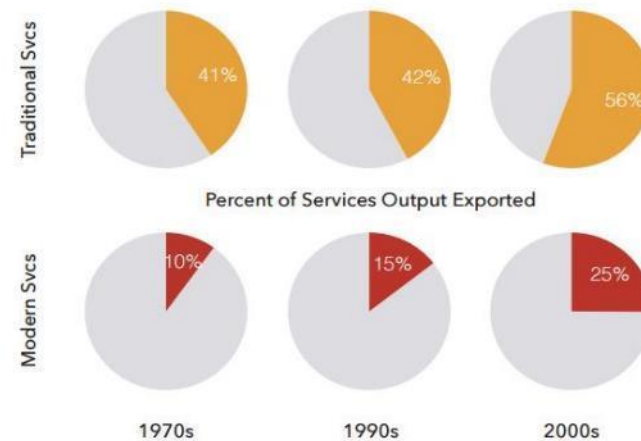


- Focus on growing demand areas (eg., high end manufacturing, services)
- Re-skilling, Up-skilling workers
- Ensure optimal land use and diversified industry base
- Diversified geographical dependencies

The manufacturing sector has constantly moved up the value chain ...



... while services have become more exportable.



# Responding to constraints We have to adapt, we need to diversify

## Food and Water diversification



Photo: NEWater

- Invested in desalination and reverse osmosis to recycle water (“NEWater”)
- Creation of artificial reservoirs to collect rainfall
- Reduce dependency on water imports.



- Import food from a variety of sources for food security
- Set up a Sino-Singapore food zone in Jilin, China
- Optimize local production
- Exploring the use of vertical farms



Responding to constraints  
We have to adapt, we need to diversify

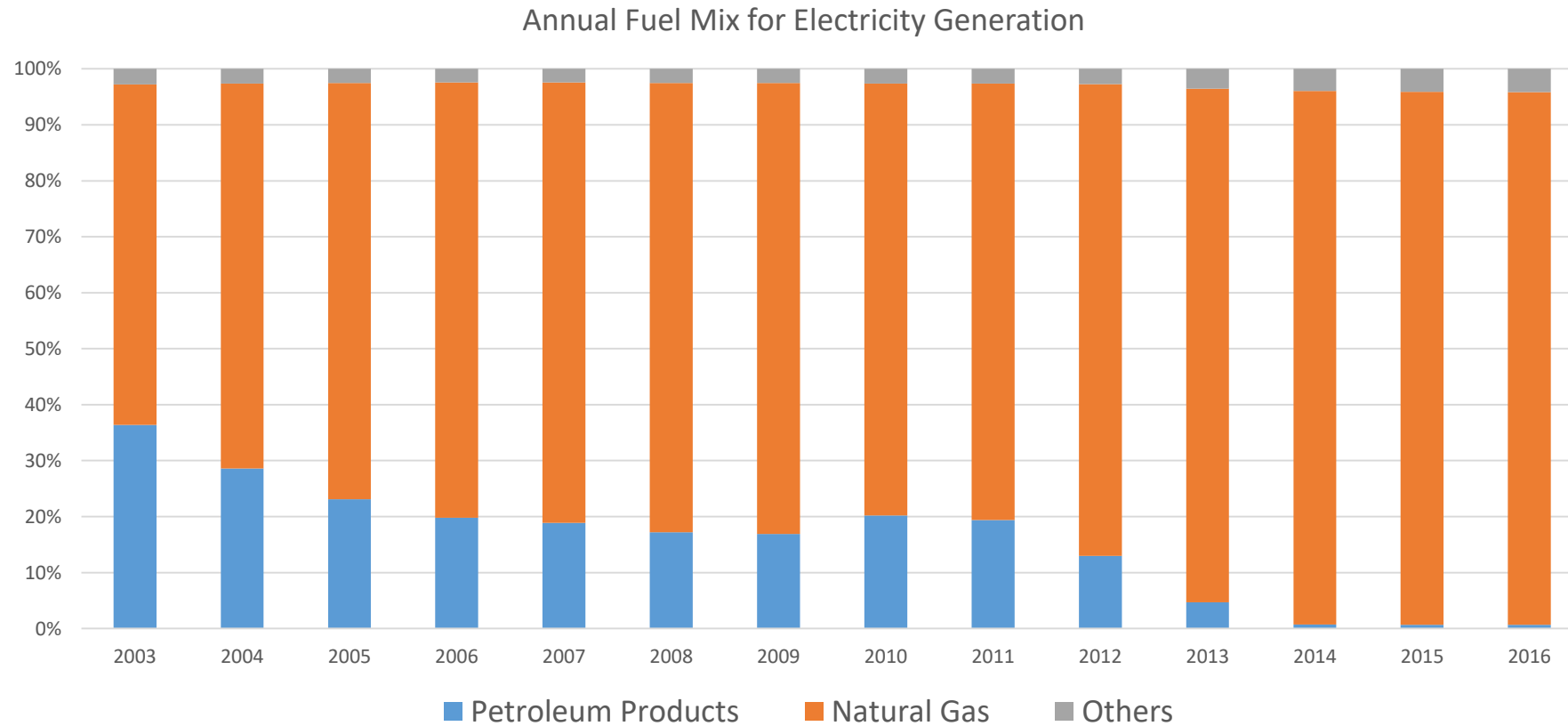


Energy diversification

## Natural Gas has become our primary fuel for electricity generation

Since the early 2000s, we switched from fuel oil to natural gas to generate electricity.

Today, more than 95% of our electricity is generated using natural gas, the cleanest form of fossil fuels.



# Responding to constraints We have to adapt, we need to diversify



## LNG terminal to diversify energy sources

- ❑ Previously relied fully on Piped Natural Gas (PNG) from immediate neighbouring countries.
- ❑ The LNG terminal commenced operations in May 2013, enabling access to the global liquefied natural gas (LNG) market.
- ❑ Today, about 70% of electricity is generated from PNG and 30% from LNG. About 5% is from various other sources including waste incineration and solar.

Proportion of LNG as a percentage of natural gas supplies is set to increase over





Responding to constraints  
We have to adapt, we need to diversify

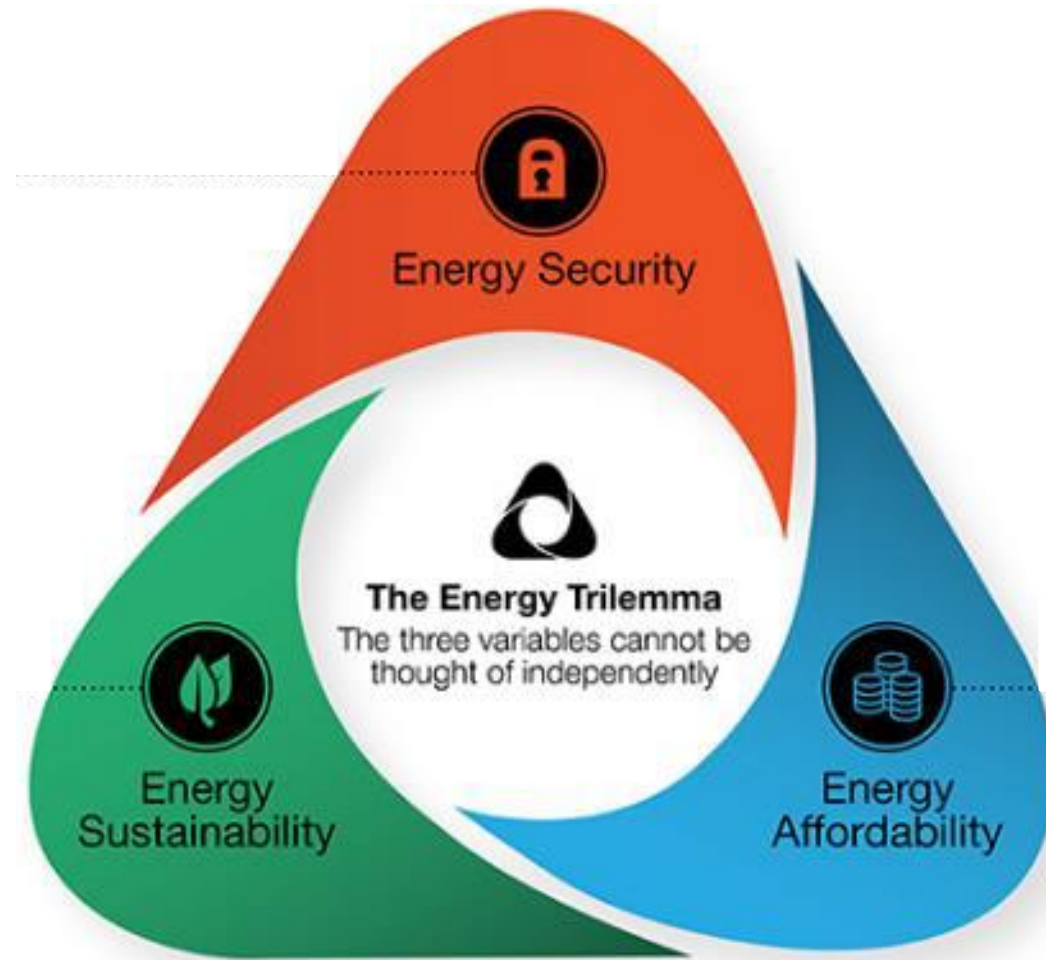


Deploying solar energy

- ❑ Solar photovoltaic (PV) has some potential for deployment
- ❑ But need to overcome challenges of land and intermittency, i.e. moment to moment power dips due to clouds
- ❑ Efforts to raise the adoption of solar PV include Floating PV on reservoirs



**In sum, energy supply needs to be secure, affordable and sustainable**



# Adaptation Efforts

As a small island country, we also need to put in resources to adaptation efforts

- Protecting our Coast
- Addressing Flood Risks
- Managing Water Resources
- Safeguarding Biodiversity and Greenery
- Strengthening Resilience in Public Health
- Creating a Cooler Built Environment

## 4. Governance of Response Measures – Best practices

**Addressing the impact of implementation of mitigation (response) measures through multilateral cooperation at the UNFCCC**

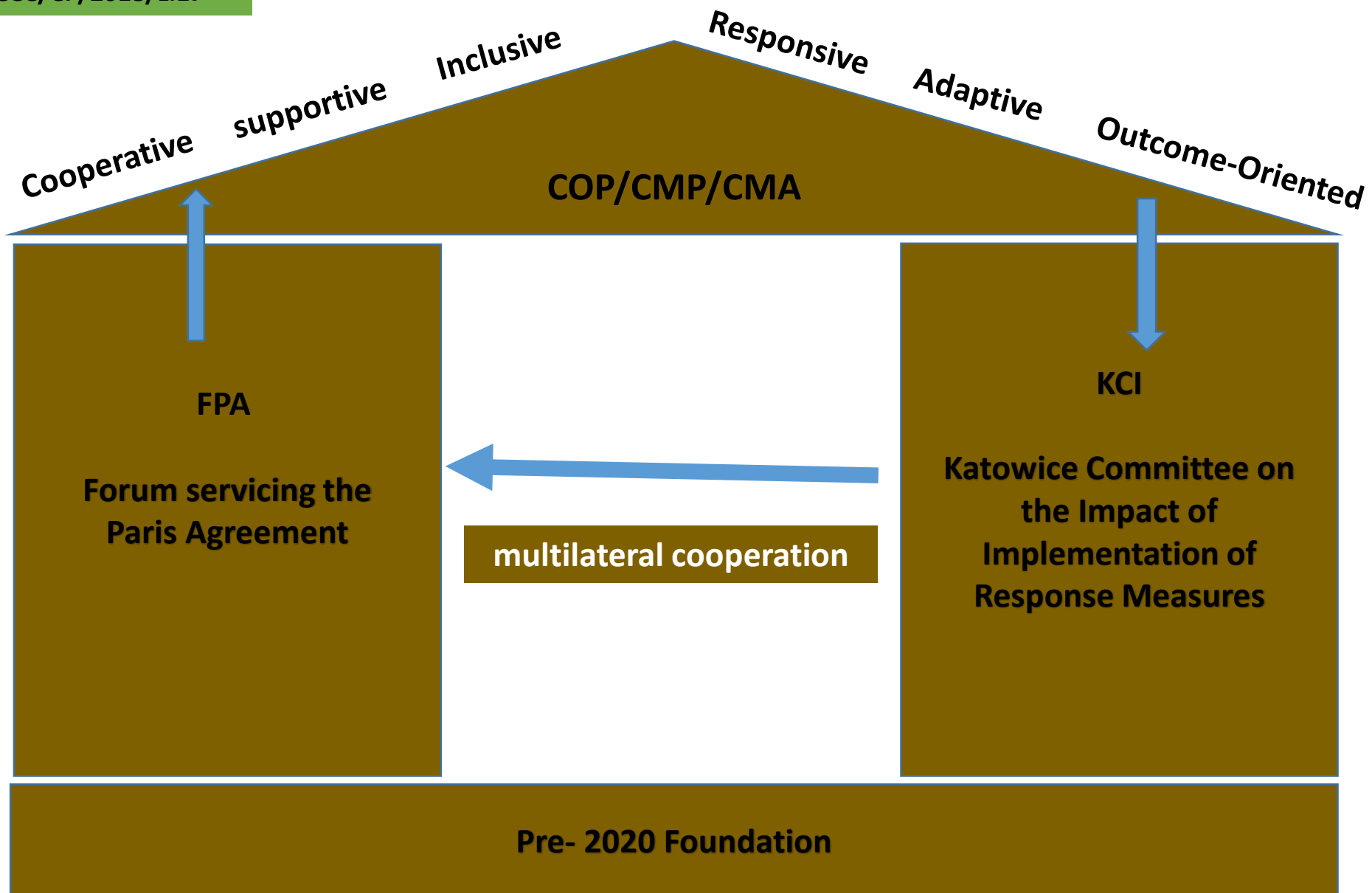
To put in another way.....

**Governance of the impact of implementation of mitigation (response) measures through under the Katowice Response Measures House**

# Katowice Response Measures House

COP24 - FCCC/CP/2018/L.17

**Best practice:** Governance of the impact of implementation of mitigation (response) measures through multilateral cooperation in accordance with Convention and Paris Agreement



# Governance of mitigation (response) measures

## Paris Agreement

*recognises that parties “may be affected not only by climate change, but also by impacts of measures taken in response to it”.*



## Mitigation measures such as:

- Carbon taxes
- Cap-and-trade schemes and related offsets
  - Carbon border tax adjustments
  - Carbon standards and labelling
  - Subsidies for low carbon goods

Impact trade flows and economies

According to the UNFCCC Secretariat, these measures have most impact on developing countries

**Best Practice:**  
**Respect international rules governing these measures**

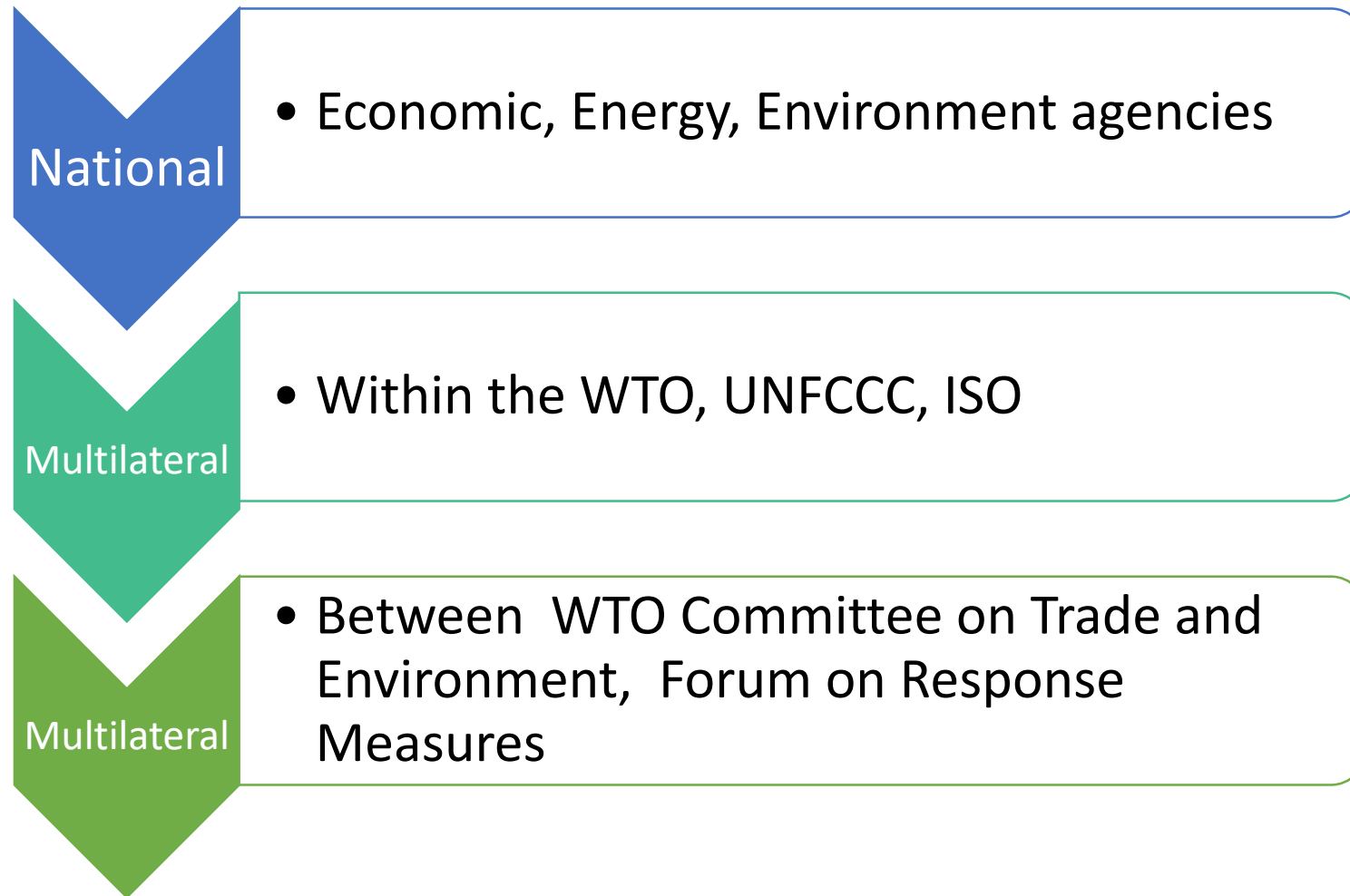
# Best Practice: Pre-emptive cooperation

## IPCC AR5

- “there are numerous and diverse explored opportunities for greater international cooperation in trade-climate interactions. While mutually destructive conflicts between the two systems have thus far been largely avoided. While mutually destructive conflicts between the two systems have thus far been largely avoided, pre-emptive cooperation could protect against such developments in the future”

# Best Practice: Pre-emptive cooperation

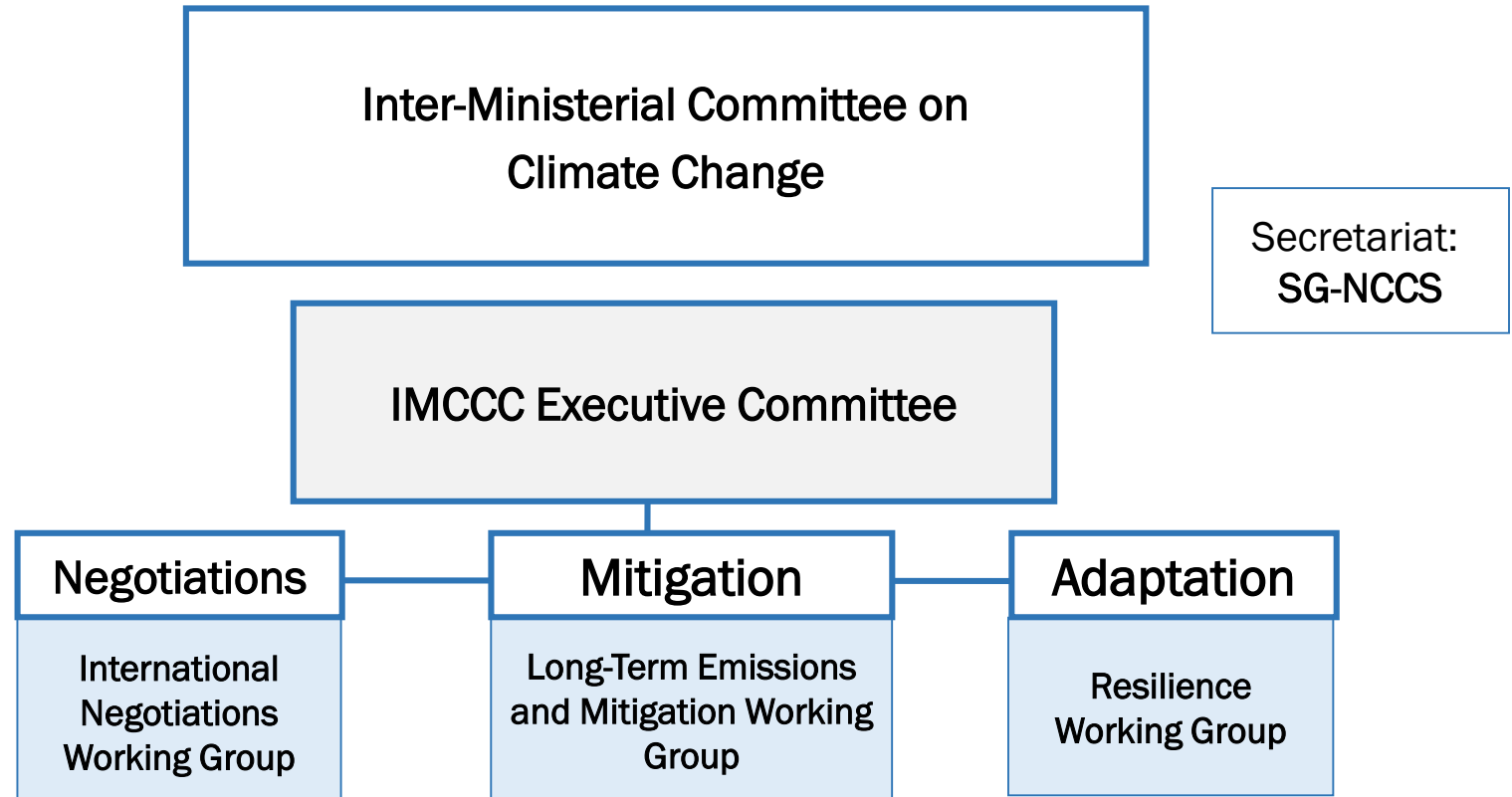
“Pre-emptive” cooperation need to take place at three levels:





# Best Practice : Institutional arrangements for whole-of-government coordinated, coherent approach

## A sample of pre-emptive cooperation at national level



## **Best Practices - Governance of Response Measures for Economic Diversification**

### **Situating response measures in Sustainable development; Promotion of supportive open international economic system**

- Economic development is essential for adopting measures to effectively address climate change (Convention Art 3:4)
- Economic Development will be facilitated if developing countries are able to diversify their economies.
- A necessary condition for economic diversification is open markets for goods and services; Open markets is an international requirement (Convention Art 3:5)

### **Coherence at the national level, and internationally**

- Whole of Government coordination
- Respect national circumstances of trading partners – tailor response measures accordingly
- Continued Inclusiveness and consultation with IOs and stakeholders given that response measures interfaces into various policy domains
- Response measures by other IOs must also respect parties' national circumstances, eg. LDCs, SIDs, Art 4.10 countries

### **Transparency of response measures**

- Ex-ante notification: Providing opportunities for parties to comment on response measures before they are implemented
- Ex-post assessment: Checking and evaluating the actual impact of responses measures

**Respect for rules-based multilateral system is critical for economic diversification. Such a system will reduce the risk of unilateral measures with adverse economic implications.**

## 4. Elements for further work



Draw up an inventory of response measures.

What are the potential economic and social consequences of these response measures?

What are lessons learned on successful diversification strategies?

Draw up non-binding guidelines for economic diversification initiatives.

What could be the elements of pre-emptive cooperation?

What could be the elements of enhanced transparency provisions?

# Elements for further focused work for the KCI

- ❑ KCI should have flexibility to frame its work consistent with Decision 7 CMA.1, and needs identified
- ❑ Key guiding consideration: To incentivize cycles of mitigation actions by parties. Harnessing positive impacts, and concurrently assist parties in addressing adverse and unintended economic and social implications
- ❑ The KCI workplan: Have right balance between the sharing of information/experience, and the conduct analytical work. Experts engaged to develop case studies on the impacts of implementation of response measures
- ❑ Immediate priority: KCI to develop methodologies and tools for assessing the impacts of implementation of response measures
- ❑ Capacity building, in particular for developing country parties, to use the methodologies and tools



Tavevellers, there is no path, paths are made by walking  
Spanish proverb

We live in a carbon and energy  
constrained world today. If there is one  
natural resource that that the world has  
left in infinite quantity, that would be  
human ingenuity...

Let a hundred ideas bloom

# Annex

# Pre-emptive cooperation

## 5 elements

### 1. Respect for Multilateralism

- The risks of unilateral actions would be high without a robust multilateral system.

### 2. Not to introduce protectionist restrictions

- Inconsistent with Convention Art 3.5
- WTO-inconsistent practices undermines the open, equitable and non-discriminatory nature of the multilateral trading system
- Counter-productive to meeting economic development and climate objectives

### 3. Recognition of national circumstances, parties' right to determine national policies

- Convention and Paris Agreement recognise that Parties have right to establish domestic policies in accordance with their national circumstances.
- This includes parties' natural endowments, development conditions, needs and priorities

# Pre-emptive cooperation

## 5 elements

### 4. Respect mandate of other IOs

- Response measures involving sectors with distinct multilateral rules should respect the mandate and longstanding competence of relevant international organisations dealing with such sectors, and be consistent with relevant and applicable international law.

### 5. UNFCCC is neither a ruling nor enforcement body

- The UNFCCC Forum on Response Measures is an avenue for discussions and is not intended to serve as a basis for the interpretation or enforcement of specific provisions of the Convention or to impose new commitments on parties.