



Post-COP24 HONG KONG FORUM

Implications for Hong Kong's Long-Term Decarbonization Strategy

21 January 2019
Event summary report

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EVENT BACKGROUND

Two decisions in the 2015 Paris Agreement made the December 2018 COP24 special:

1. Asking the Intergovernmental Panel on Climate Change (IPCC) to report by COP24 on the benefit of keeping temperature increases to 1.5°C rather than the previous objective of 2°C. Further how this can be done.

The IPCC has reported that:

- a. The climate system is more sensitive than previously thought and there are very significant benefits from keeping global average temperature increase to 1.5°C rather than 2°C.
 - b. Keeping temperature increase to 1.5°C is geo-physically possible but requires rapid action to reach carbon neutrality by 2050.
2. Tasking COP24 with finishing the 'Paris Rulebook': The Paris Agreement used constructive ambiguity to allow countries with different views to sign up. Agreeing the Rulebook required eliminating these ambiguities. Contrary to expectations, COP24 succeeded in agreeing rules on reporting of emissions, stock-takes on progress in mitigation, adaptation, financial flows, addressing loss and damage, and boosting the ambition of Nationally Determined Contributions (NDCs). The only significant area it had to postpone until next year was agreeing rules on international carbon trading (Article 6).

The forum therefore addressed:

1. The Governments' actions following COP24:

- How will implementing the Paris Rulebook affect China and Hong Kong?
- What will be done to raise ambition on reducing carbon emissions given the IPCC 1.5°C report? Noting that:
 - The Paris Rulebook provides a 'common playing field' for ratchetting up NDCs.
 - The 2018 Talanoa dialogues' objective was to raise ambition.
 - The Paris Agreement calls for NDCs to be revised at COP26 in 2020. Key events prior to that are the UN Secretary General's September 2019 summit in New York and COP25 in Chile.
- China's action including its announced, but not implemented, national carbon trading scheme.
- The Silesian Declaration on Just Transition.

2. Private sector action to decarbonize Hong Kong given the IPCC's advice that global carbon-neutrality is needed by 2050 to keep global average temperature increase to 1.5°C:

- How can engineering our city and buildings reduce Hong Kong carbon emissions?
- How will Hong Kong, as a financial services center, play a role in the investment needed regionally to create a low-carbon, climate-resilient economy?
- How can Hong Kong move to zero carbon electricity by 2050?
- How will the Hong Kong's Council for Sustainable Development's public engagement gather views on Hong Kong's long-term decarbonization?'

EVENT PROGRAM

08:30	Reception with coffee/tea		
09:00	Opening remarks	Mr. Robert GIBSON Civic Exchange / HKUST	Video
09:05	PANEL 1 – PROGRESS AT KATOWICE ON THE PARIS AGREEMENT		
	Moderated by Mr. Robert GIBSON , Civic Exchange / HKUST		
	A view from Beijing	Prof. Ye QI HKUST and Tsinghua University	Video
	A European view	Ms. Vicky POLLARD EU Environment and Climate Counsellor in China	Video
	Hong Kong perspectives	Dr. Agnes WONG Environmental Protection Department, HKSAR Government	Video
	Panel discussion / Q&A		Video
10:15	Coffee/tea break		
10:45	PANEL 2 – WHAT POINTERS DOES COP24 GIVE THE PRIVATE SECTOR ON ACTION TO DE-CARBONISING HONG KONG?		
	Moderated by Mr. Simon NG , BEC		
	Engineering Hong Kong becoming a low-carbon, smart and resilient city	Dr. Bruce CHONG Arup Management Consulting	Video
	Financing action on climate change	Mr. Jonathan DREW Infrastructure and Real Estate Group, Global Banking and Markets, HSBC	Video
	How Hong Kong can obtain carbon neutral electricity – including implications of Shell’s SKY scenario	Eurlng. Henry WANG SOAS Advisory Board London University	Video
	Hong Kong’s Long-term decarbonization strategy	Prof. LAM Chiu-ying Support Group on Long-term Decarbonisation Strategy, Council for Sustainable Development	Video
	Panel discussion / Q&A		Video
12:30	Closing remarks	Mr. Simon NG BEC	Video

This report, plus other materials from the Post-COP23 Hong Kong Forum, can be viewed and downloaded [HERE](#).

SPEAKERS AND MODERATORS (in alphabetical order)



Dr. Bruce CHONG is Associate Director at Arup Management Consulting, focusing on resources efficiency, green infrastructure, smart and resilient city planning. He is the Skill Leader of Resilience City and Sustainable Infrastructure Design Leader in East Asia region of Arup, working on master-planning, strategic resources planning and building projects in Hong Kong, China and other South-East Asian countries. Bruce is a Cambridge Overseas Scholar, and a Research Fellow in the Sydney University. He received the Young Green Leader Award in 2013, launched by the EV Division of HKIE. His latest research interest is on energy economics to examine circular economy and resources consumption in global supply chain. Bruce recently wrote a book on 'Smart-Green-Resilient', published by HKU Press in 2016.



Mr. Jonathan DREW is a Managing Director in the Infrastructure, Real Estate Group at HSBC. Mr Drew graduated with an MA in Economics from Cambridge University in England and is also qualified as a Chartered Accountant. Mr Drew started his banking career more than 20 years ago in London and after working in rapidly emerging Latin America and raising capital for large scale projects in the Middle East has been based in Hong Kong since 1997 witnessing first-hand the rapid growth of Asia and notably China. During this he has been involved in successful transactions across a wide range of sectors including advising on and arranging finance for projects that produce and deliver energy (renewable and non-renewable) and transport people and resources from source to point of consumption as well as a wide range of infrastructure projects in social and education sectors with a focus on resource efficiency and sustainability. These transactions have involved supporting projects, corporates and institutions to approach various financial markets and structuring innovative and tailored products including green bonds and loans to meet the often large and specific needs of clients in markets with very distinct financial and regulatory characteristics. Mr Drew is responsible for driving HSBC's Sustainable Finance initiative across the Asia region for the banking business and also chairs the Asia Pacific Loan Market Association Green Loan Committee.



Mr. J. Robert GIBSON is Adjunct Professor at Hong Kong University of Science & Technology and a Fellow of Civic Exchange. He focuses on mechanisms for making capitalism more sustainable and facilitating action by business to mitigate greenhouse gas emissions and adapt to climate change. He worked for the Swire Group up to 2010 including being the Director Sustainable Development for John Swire & Sons (HK) from 2007 to 2010.



Prof. LAM Chiu-ying is Convenor of Support Group on Long-term Decarbonization Strategy in the Council for Sustainable Development, Chairman of The Hong Kong Countryside Foundation, and former Director of Hong Kong Observatory. Prof. Lam is a Chartered Meteorologist and an Honorary Fellow of Royal Meteorological Society. He was the Vice President of the Asian arm of the World Meteorological Organization (WMO) from 2003 to 2008, and has served the WMO as chairman of expert groups and as mission consultants. As a well-respected meteorologist, Mr. Lam lectures widely to raise public awareness about climate change and necessary response actions.



Mr. Simon NG is Director – Policy & Research of Business Environment Council ("BEC"). He is responsible for BEC's work on policy advocacy, thought leadership development, and collaborative research on various environmental issues. Trained as a geographer, Mr. Ng is known for his ground-breaking work on ship emissions inventory in Hong Kong and the Pearl River Delta, and his collaboration with the shipping industry leading to the launch of the Fair Winds Charter. He is also well regarded for his research and engagement work on walkability. Mr. Ng has over 20 years of experience in academic/policy research, project management and stakeholder's engagement. Before joining BEC, he was Chief Research Officer of Civic Exchange.



Ms. Vicky POLLARD, Environment and Climate Counsellor of EU delegation in Beijing has been working on environmental policy and economics since 1993 in a range of jobs, including as a consultant, as chief executive of the European Wind Energy Association and as economist in the UK government and Environment Agency. She joined the European Commission in 2004 and worked on the EU's Lisbon Strategy for Growth and Jobs and the review of the EU Sustainable development strategy before joining the climate change team. She has worked on climate change for the Commission since 2006 covering international negotiations, relations with the US and other OECD countries and domestic policy. Before moving to Beijing, Vicky was deputy head of unit in the European Commission's Directorate General for Climate Action responsible for implementation of the EU emissions trading system. In August 2014, Vicky took up the post of First Counsellor for Environment and Climate in the EU's delegation to China, based in Beijing, where she covers all aspects of the relationship with China on environmental and climate- in terms of bilateral policy dialogues and cooperation on implementation and issues related to international negotiations.



Prof. Ye QI is Professor of Public Policy and Director of Institute of Public Policy at Hong Kong University Science and Technology. Prior to joining HKUST in January 2019, he was the Cheung Kong Professor of Environmental Policy and Management at Tsinghua University's School of Public Policy and Management, and the Volkswagen Professor of Sustainability at Schwarzman College. From April 2014 to January 2019, he was Senior Fellow at the Brookings Institution and the Director of Brookings-Tsinghua Center for Public Policy. Before returning to China in 2003, he taught ecosystem management and climate change science at the Department of Environmental Science, Policy and Management at University of California, Berkeley from 1996 through 2003. Ye Qi received his Ph.D. in Environmental Science in 1994 jointly awarded by the State University of New York College of Environmental Science and Forestry and Syracuse University.



Eurling. Henry K. H. WANG is an international adviser, author & speaker with extensive high level business experience globally. He is President of Gate International Ltd and was a former director of both Shell China and SABIC in Riyadh. He is a Fellow of the Royal Society of Arts FRSA and Fellow of Institute of Chemical Engineering. He has been invited to join the London University SOAS Advisory Board and University College London China Advisory Board. He is also a member of the Imperial College London Grantham Climate Change Stakeholder Committee & China Carbon Forum Advisory Board. His 3 books "Successful Business Dealings & Management with China Oil, Gas & Chemical Giants", "Energy Markets in Emerging Economies: Strategies for Growth" and "Business Negotiations in China" were published globally by Routledge. His negotiation management paper was selected as one of Top Five UK Management Papers of the Year 2015. He also holds international patents on new process inventions.



Dr. Agnes WONG is Environmental Protection Officer of Environmental Protection Department (EPD), HKSAR Government. Agnes is working in EPD's Cross Boundary and International Group, responsible for climate change policy coordination with focus on the compilation of Hong Kong's greenhouse gas inventory and work relating to the UNFCCC including the Paris Agreement. Before joining the group, she has worked at various groups of the department, assisting in air quality monitoring, emission control for power plants and enforcement of environmental regulations. Agnes is a Chartered Engineer. She attended COP24 and will give an account of the climate actions of the Government, including the development of Hong Kong's long-term decarbonization strategy up to 2050 as required by the Paris Agreement.

EVENT SUMMARY

PANEL 1 – PROGRESS AT KATOWICE ON THE PARIS AGREEMENT

Opening Remarks

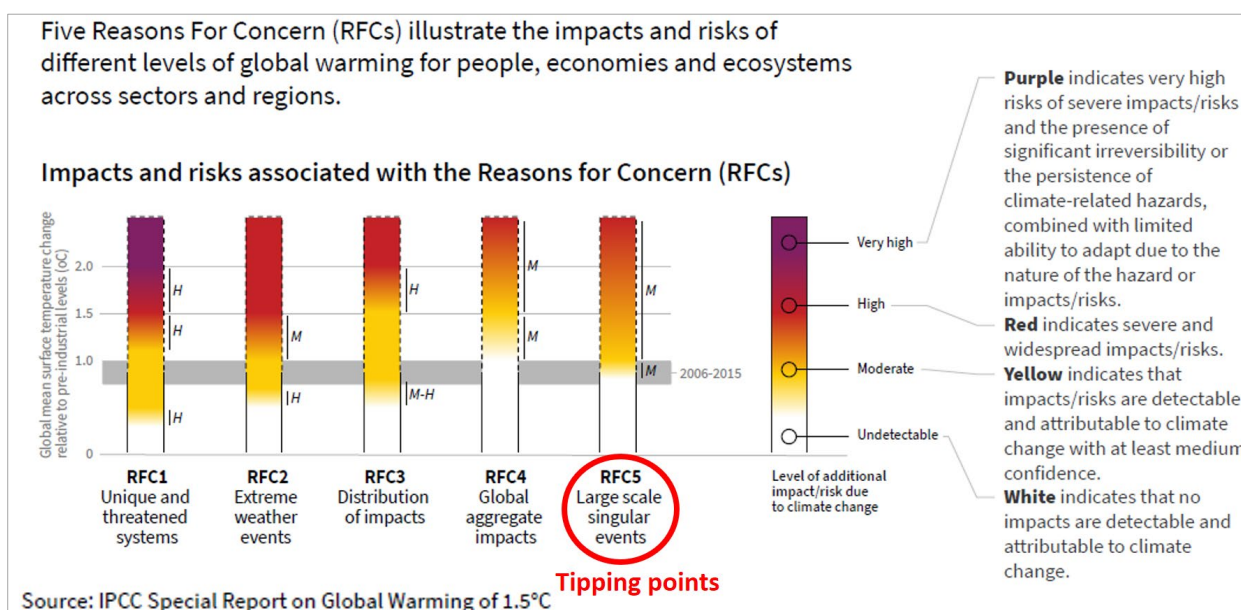
Mr. Robert Gibson

HKUST and Civic Exchange

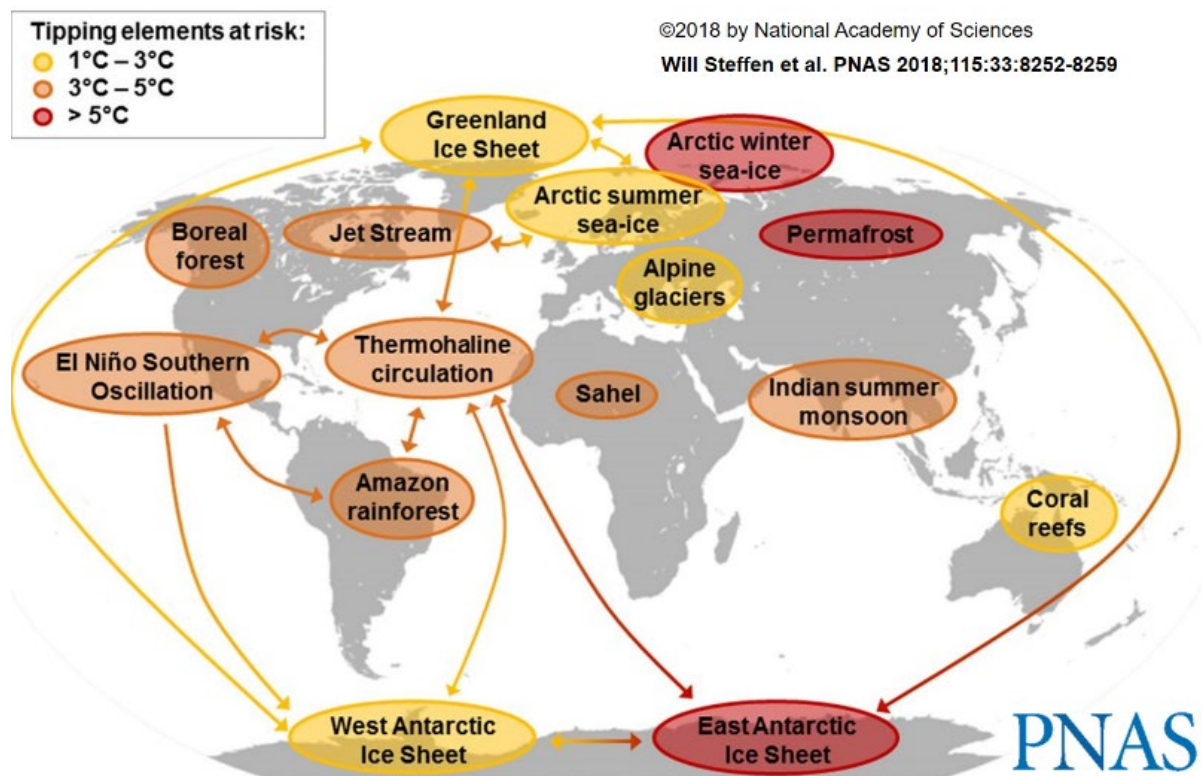


Climate Science:

The IPCC's October 2018 report on global warming of 1.5°C used the following chart to highlight how much worse an average temperature increase of 2.0°C is than one of 1.5°C.



The report found that the Earth's climate system is more sensitive to temperature increases than had been previously thought. Further that the damage from temperature increase rises exponentially with temperature. In summary, 2.0°C increase causes substantially more damage than 1.5°C.

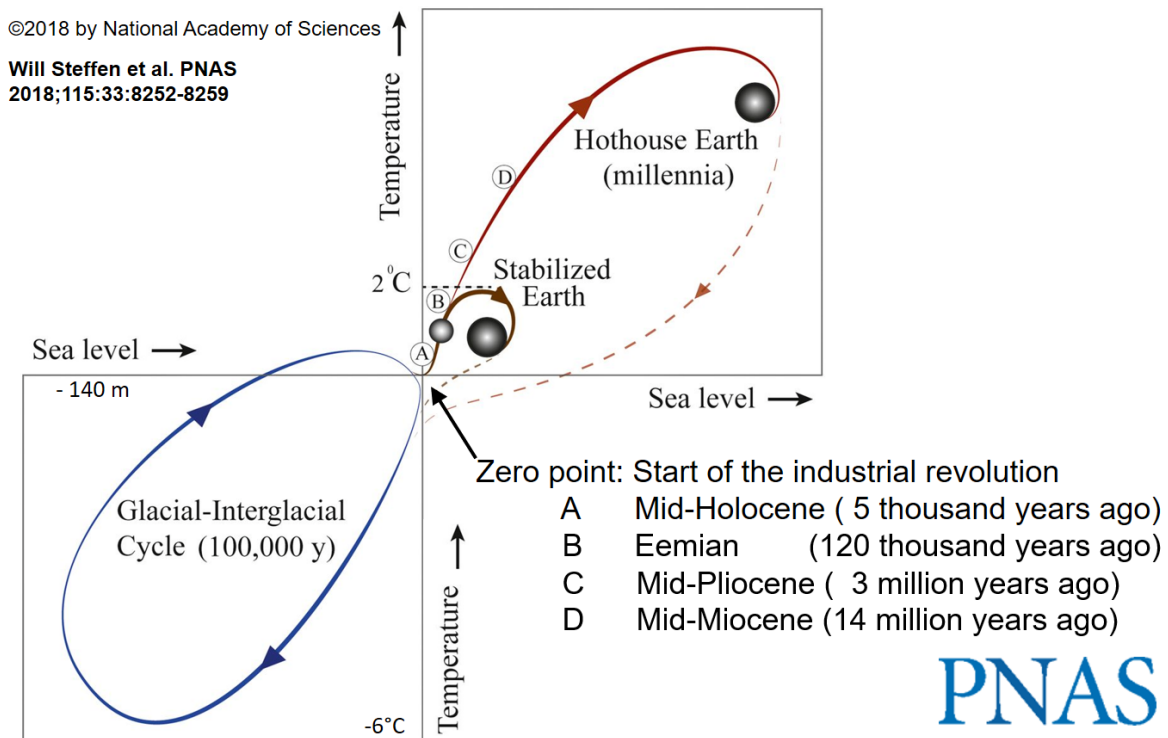


Further, a higher temperature increase makes it more likely that ‘large scale singular events’ (“tipping points”) will be triggered and there will be a ‘cascade’ in which one tipping points trigger others, causing a substantial increase in damage – see the chart on the above.

For example:

- The substantial reduction in summer sea ice in the Arctic, which is already happening, is causing the Arctic to warm much faster than the rest of the planet. This in turn may lead to the Greenland Icecap entering a state where it will eventually almost totally disappear.
- The rising sea levels from the Greenland icecap melting increases the threat to the ice-sheets off the coast of West Antarctica and hence the risk of a substantial increase in the flow of ice from the land of West Antarctica into the sea.
- The warming of the Arctic may also destabilize the jet-stream causing periods of extreme weather in North America, Europe and northern Asia.

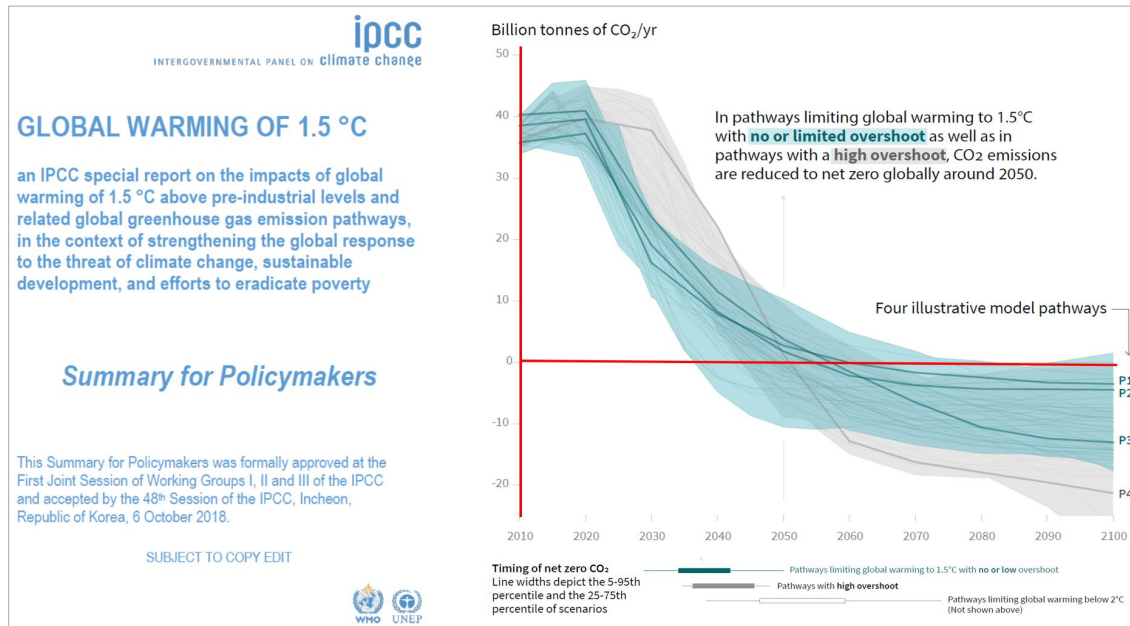
The extent of global warming that could, eventually be triggered by cascading tipping-points is of grave concern. See below for a schematic illustration of possible future pathways of the climate against the background of the typical glacial–interglacial cycles (Lower Left).



At the start of the Industrial Revolution the Earth System was in an interglacial period at the center of this chart. Over the past 500,000 or more years it has moved around the lower left quadrant as falling temperature leads to ice building up on land and sea level falling. And then, driven by orbital cycles temperatures have risen and the ice has melted.

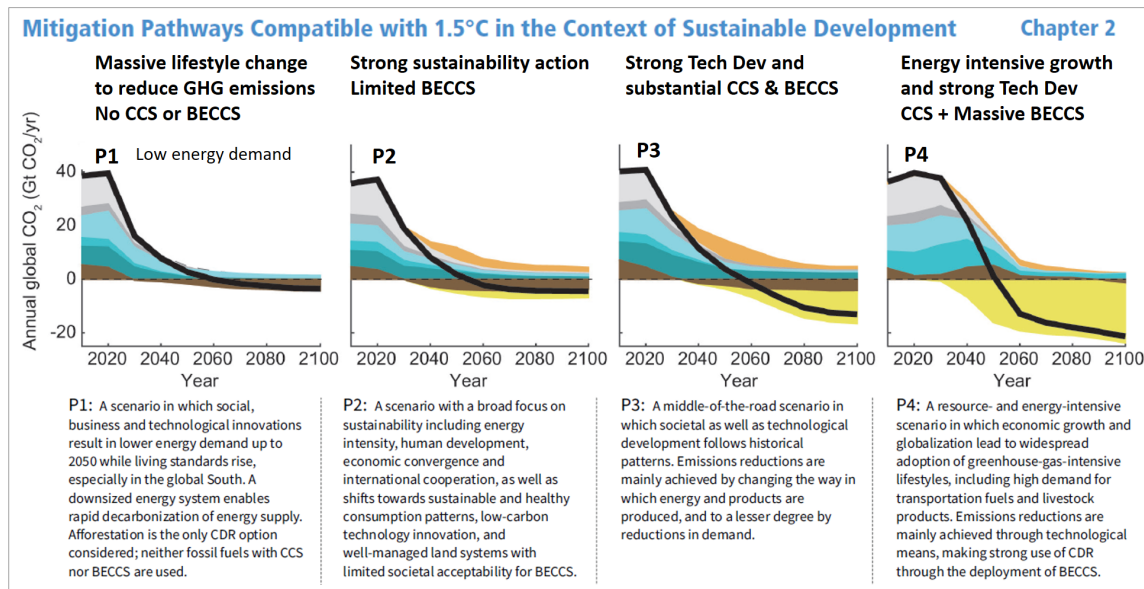
If it were not for humanities carbon emissions the Earth would now be starting on another cycle towards an ice-age. Instead our carbon emissions have raised temperatures by 1°C and started to raise sea levels putting the Earth on the spot shown by a small disc just into the top right quadrant of the diagram. The red lines show the possible paths from here. One where we reduce carbon emissions and ‘Stabilized’ Earth. The other were emissions continue and we end up on the hothouse Earth pathways. The proposed planetary threshold at ~2 °C above the preindustrial level is also shown. The letters along the Stabilized Earth/Hothouse Earth pathways approximately represent three time periods in Earth’s geologically-recent past when it has been hotter than today.

The IPCC advises keeping average temperature increase to 1.5°C above the pre-industrial level is geo-physically possible. Further humanity can choose between a number of pathways for achieving the reduction. These are illustrated as follows.



Pathways which are slower to reach carbon neutrality must compensate by using Bioenergy Carbon Capture and Storage (BECCs) to suck CO₂ out of the atmosphere after 2050.

The diagram below gives more detail for pathways P1 to P4.



The P1 pathway does not require Carbon Capture and Storage (CCS) (the orange slice at the top of the charts) or BECCS (the yellow slice at the bottom of the charts). Instead, it requires massive lifestyle change including substantial reduction in meat consumption, air-condition and travel. The other pathways are for progressively higher consumption levels with progressively greater use of CCS and BECC. All scenarios are substantial reductions on our current 'business as usual' pathway. Which pathway is followed is humanity's choice.

What was COP24 (the 24th Conference of the Parties to the United Nations Framework Convention on Climate Change) like?

COP24 was held on the site of a disused coalmine in the center of an extensive coal mining and steel manufacture area. It had poor air quality from nearby coal fired power stations. The pictures below show some of the old mine buildings by the conference center, Katowice's exhibition at COP24 with cages of coal and a distant view of one of the coal fired power stations.



Inside the conference center David Attenborough asked powerfully for the assembled Leaders to lead an adequate response to the climate change threat. There were then numerous meetings to negotiate the Rulebook and receive the results of the Talanoa Dialogues on raising ambition.



The picture just above is of the meeting to hear the results of the finance section of the Talanoa dialogue.

Aside from the formal government sessions shown above, the COP had numerous ‘side-events’ discussing the results of research on the dangers of climate change and promoting solutions. The photographs below show some of the meetings in the China and European Pavilions. Often, Governments involved in difficult negotiations can be found jointly promoting solutions in the ‘side-event’s. For example, the bottom-right photograph has Canada, China and the European Union all presenting their action on carbon pricing.



Finally, the bottom-left picture shows the Hong Kong attendees, including youth representatives at COP24. Also pictured is the presentation Carbon Care Asia made on its ‘Paris Watch’ program for monitoring Hong Kong’s contribution to achieving the goals of the Paris Agreement.



A view from Beijing

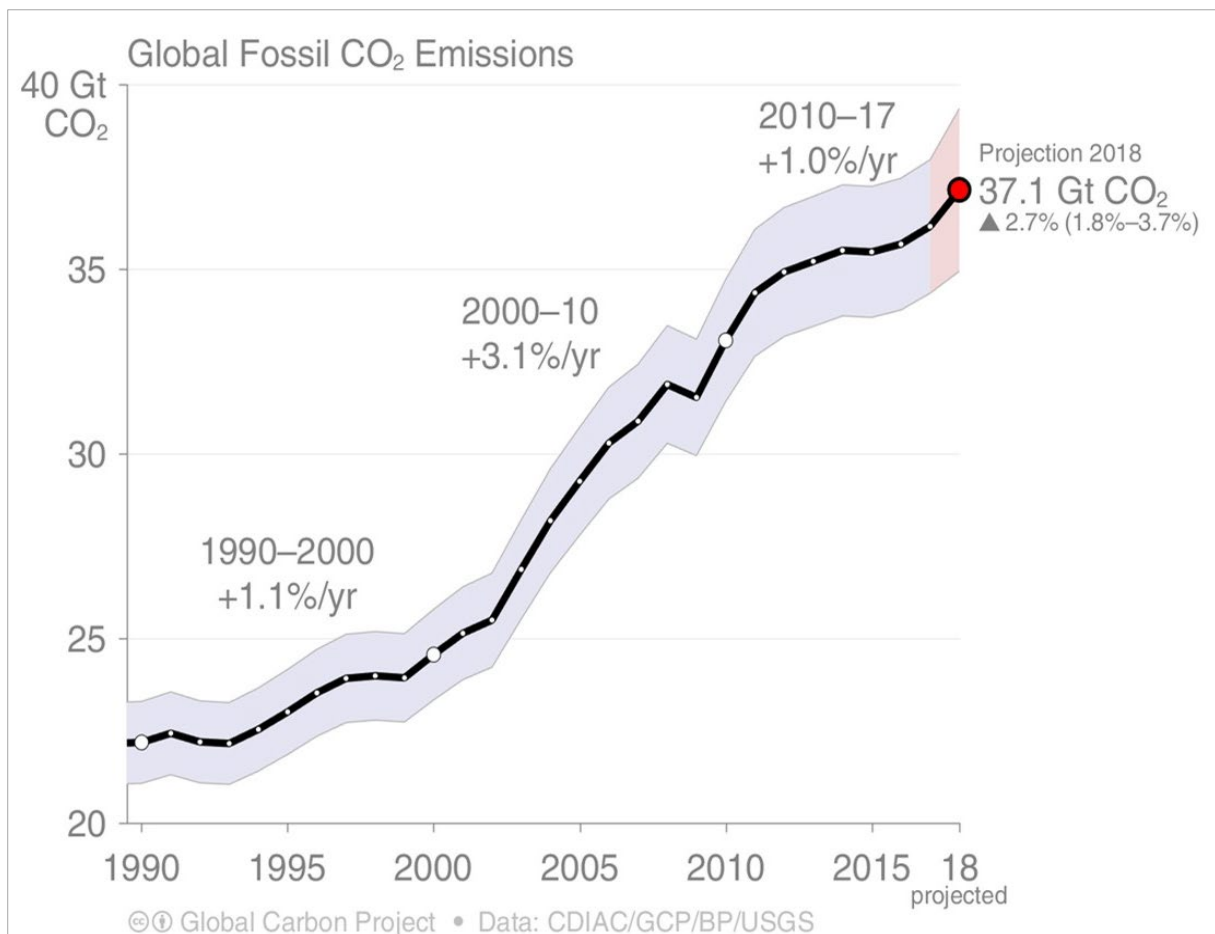
Prof. Ye Qi

HKUST; Tsinghua University, The Brookings Institute

Prof Ye Qi asked: “Can the goals set out in the Paris Agreement on the response to climate change can be delivered?” Namely to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C.

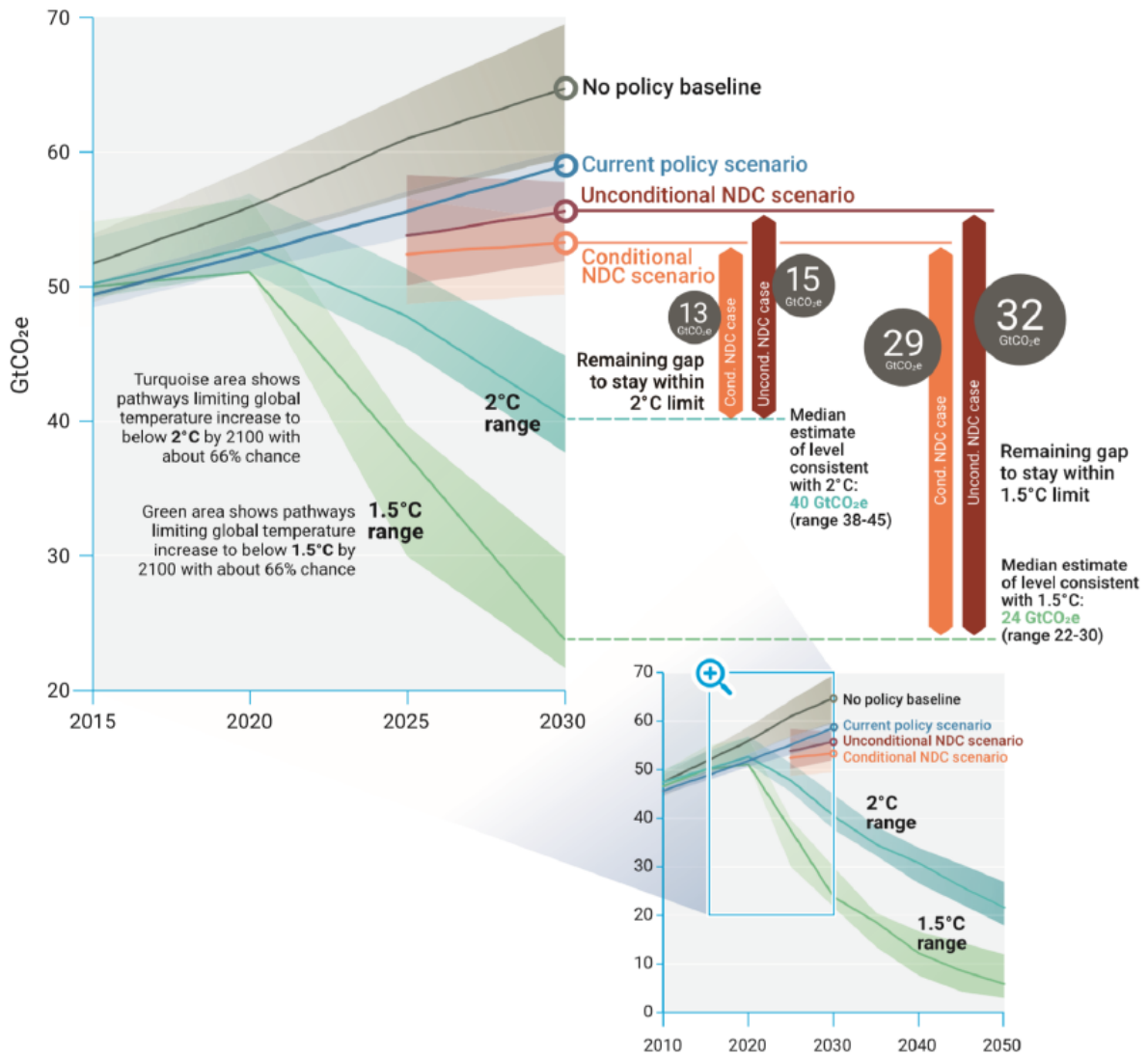


His answer is it is unlikely the Paris Agreement will deliver this 2°C target. While global emissions plateaued in 2014 to 2016 the upward trend resumed in 2017 and 2018. Viz:



The 'gap' between current emissions and what is needed for 2 °C has grown:

Figure 3.1: Global greenhouse gas emissions under different scenarios and the emissions gap in 2030 (median estimate and 10th to 90th percentile range).



Source: www.unenvironment.org/resources/emissions-gap-report-2018 Page XVIII

A summary of the gaps between pledged target, pledged policy and enacted policy.

Prof Ye QI noted:

- Country NDCs are what they wished to commit to and well short of what is needed to achieve 2°C. (Unconditional NDC would result in 3.2 °C while NDC which are conditional on a country receiving financial or other help are 3 °C.)
- Many countries are not on track to meet the reduction in their Nationally Determined Contributions (NDC) to reducing greenhouse gas emissions by 2030. Others have very weak NDCs. (See below)
- Scientists advise limiting global warming to below 2°C requires the global emissions need to peak by 2020, decline by about 25% by 2030; and, reach net zero around 2070.
- This is not happening. Rather, after a slow-down in 2014-2016, atmospheric CO2 is at record high and increased 2.7ppm in 2018.
- On current trends emissions will not peak by 2030 even if countries fully implement their climate commitments.
- Further scientists now estimate the emissions gap is larger than they previously calculated.

Only 6 of the World's 20 Largest Economies Are On Track to Achieve Their Paris Climate Commitments
EXPLAINING THE UNEP GAP REPORT

	PER CAPITA GHG EMISSIONS IN 2030 COMPARED TO 2015	ON TRACK TO MEET COMMITMENT?
Argentina	-6%	Not on track
Australia	-29%	Not on track
Brasil	-22%	On track
Canada	-33%	Not on track
China	+17%	On track
European Union	-23%	Not on track
India	+67%	On track*
Indonesia	+15%	Uncertain
Japan	-13%	On track
Mexico	-2%	Uncertain
Republic of Korea	-21%	Not on track
Russia	+33%	On track*
Saudi Arabia	+19%	Not on track
South Africa	0%	Not on track
Turkey	+102%	On track*
United States (2025)	-25%	Not on track

Source: UN Environment Emissions Gap Report, 2018.
Note: Per capita emissions and commitments implied by unconditional NDCs.
*current policy trajectory more than 10% lower, indicating weak NDC

To quote Victor et al. 2017. *Nature*:

The Paris agreement gives countries the flexibility to set their own commitments. The idea is that as each country implements its own pledge, others can learn what is feasible, and that collaborative global climate protection will emerge. That logic, however, threatens to unravel because national governments are making promises that they are unable to honour. Ambition is no substitute for action.

Climate change is an issue of great public interest, especially in countries in which governments feel they must be seen to lead on global solutions. It is easy for politicians to make promises to impatient voters and opposition parties. But it is hard to impose high costs on powerful, well-organized groups. No system for international governance can erase

these basic political facts. Yet the Paris agreement has unwittingly fanned the flames by letting governments set such vague and unaccountable pledges.

So, **seeking truth from fact (實事求是)** Prof Ye QI finds:

- Generally:
 - The pledges of NDC's are voluntary and not legally binding
 - Implementation faces multiple challenges
 - The UN-lead climate process is not working as well as many would like to believe
- What works well:
 - Domestic policies and actions
 - Technological innovations and deployment
 - Investment in technology
 - Consensus about climate change science
 - Decoupling the economy from fossil fuel
 - Young generation mobilization
- What does not work so well:
 - Targets are not met
 - Finance is not available
 - Significant Tech transfer has not occurred as a result of the UNFCCC process
 - Emissions have not responded to the UNFCCC process
 - Carbon market does not meet expectations
- We must overcome these problems by improving climate governance. We must do this without action to reduce GHG emissions being delayed. Specifically, we must:
 - Engage stakeholders whose decisions are critical to the just transition to a low-carbon, climate-resilient economy.
 - Design approaches which will enable these stakeholders to rapidly implement the initiatives required. This may require redefining the roles of the UN, governments, business and commerce.
- Actions required to ensure our common future and build our civilization include:
 - Reinforcing technological change
 - Rebalancing the economy
 - Reshaping our values and culture

A European view

Ms. Vicky Pollard

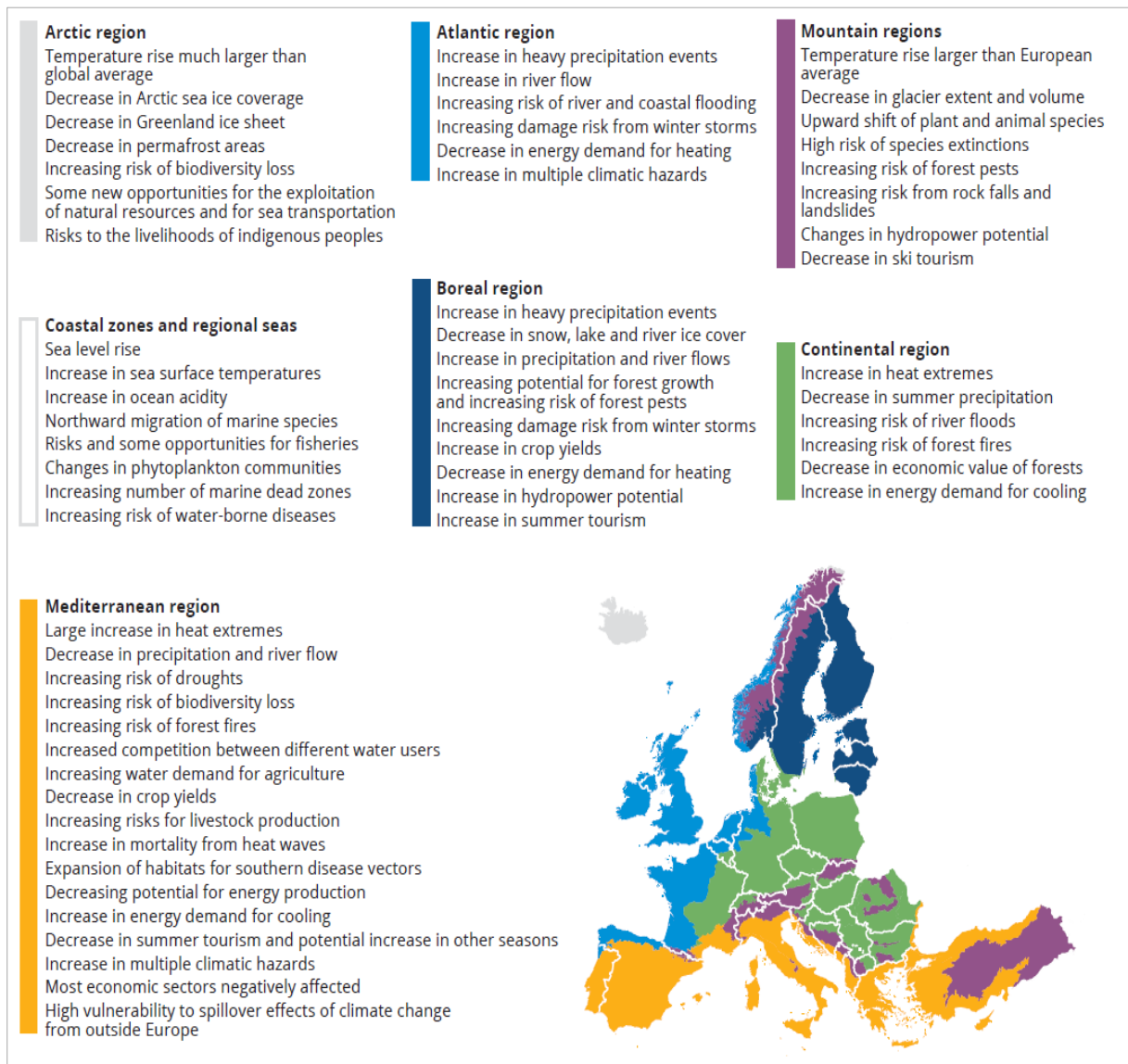
European Union Environment and Climate Counsellor in China

Vicky Pollard noted:

- Global warming already reached at 1°C
- 18 of the warmest years in the last two decades and extreme heat waves in EU for 4 of the last five years. This has had a real impact on the EU economy & environment
- IPCC warns us that global eco-systems will be in danger at 2°C
- Climate change undermines security and prosperity in the broadest sense



Climate changes affecting the EU and neighboring countries include:



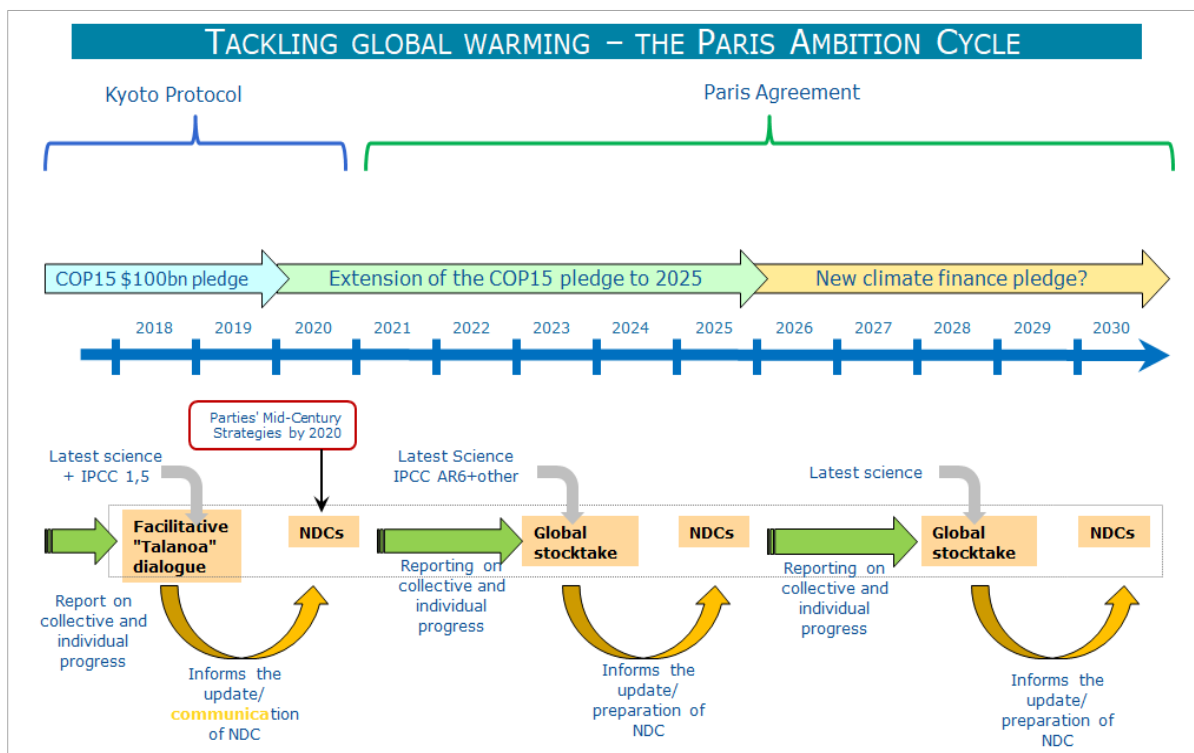
The components of the Paris Agreement which address climate change issues are:

1. An improved transparency framework
2. Enhancing the multilateral climate regime which includes:

MITIGATION	MARKETS	FINANCE	CAPACITY BUILDING	LAND
ADAPTATION	RESPONSE MEASURES	TECHNOLOGY	SCIENCE	FACILITATION AND COMPLIANCE

3. A 5-yearly cycle for raising ambition on action on climate change. The first round of this was the Talanoa Dialogue in 2018 with countries asked to tighten their NDCs in 2019 and 2020. This will then be followed by a full 'Global Stocktake' every five years starting 2023 to form the basis for further ratchetting down of NDCs.
4. A Global Climate Action Agenda.

The interplay between the Paris Agreement's review mechanism and national action can be illustrated as:



The key task for COP24 was to agree a **Rulebook** providing the operational transparency and governance regime needed to implement the Paris Agreement. The EU worked for the "rulebook" to be:

- consistent with what was agreed in Paris
- robust and applicable to all countries with flexibility for some countries which lack capacity
- tailored to mitigation, support and adaptation

- sufficiently detailed for the Paris Agreement to be operational
- a basis for a continuous improvement over time

Many countries agreed with EU, but some:

- resisted robust rules which they felt weakened their sovereignty
- held on to developed countries (as defined by the annex to the Kyoto protocol) being treated differently from other 'developing' countries
- wanted equivalent rules for tracking finance as for tracking emissions
- required more resources to be given to them build their capacity to implement rules

The negotiations succeeded in agreeing a rulebook which included:

1. **A transparency framework** of modalities, procedures and guidelines for application from 2024 onwards for:
 - GHG inventories based on IPCC 2006 guidelines, with embedded flexibility in case of data unavailability
 - Tracking progress with NDCs on basis of self-determined indicators and projections. This is a requirement that applies to all countries which have capacity
 - Financial support provided and mobilised reported in accordance with accounting modalities
 - Review for all parties
 - Robust reporting on adaptation, including methodologies used. This includes reporting information on loss and damage.
 - Technical assistance from a Consultative Group of Experts.
2. **Accounting rules** with minimum standards for explanatory information accompanying NDC's mitigation targets. These include:
 - The reference point with which the NDC target is compared.
 - The timeframe, sectors and gases covered.
 - The methodologies needed to understanding individual and aggregate NDCs for the Transparency Framework and Global Stocktake (GST). There is strong encouragement to use this for updates of 2020 NDCs and mandatory requirement to use it for 2030 and later NDCs.
 - A structured summary (a key EU ask) for recording NDCs so a table format can be used to track progress.
 - Using the Global Warming Potentials from the IPCC's AR5 for the NDC issued in 2020.

Items left for agreement next year:

- Provisions for avoiding double counting in international trade in carbon allowances (see next section).
- Common Time Frames and NDC Registry.

The chapter of the Rulebook on International Carbon Markets and Mechanisms was left to be agreed next year. This was mainly due to Brazil resisting a comprehensive approach to accounting. The chapter needs to include:

1. Market Related Accounting (Article 6.2) where key issues remain:
 - Use of markets towards a single year target, where a variety of approaches to address comparability and integrity have been proposed
 - Use of markets outside the scope of NDCs, where the final text presented a clean solution, but we know many may resist in future negotiations
 - The application of share of proceeds to trading remains a key demand of African and other groups.
2. Market Mechanism (Article 6.4) There was progress regarding crediting through use of benchmarks but no agreement on the governance covering a country's participation.
3. Non-Market Approaches (Article 6.8) There was no agreement on new institutions and needs assessment required for non-market approaches.
4. Kyoto Protocol (KP) and the Clean Development Mechanism (CDM). There was no agreement on how to handle the Legacy of the KP, including on use of units from both the CDM and other mechanisms. Some countries demand measures which others see as likely to undermine action to reduce GHG emissions. A report will be prepared on the winding down of the KP mechanisms including both CDM and JI, and the fate of the CDM's substantial accumulated budget to help decisions next year.

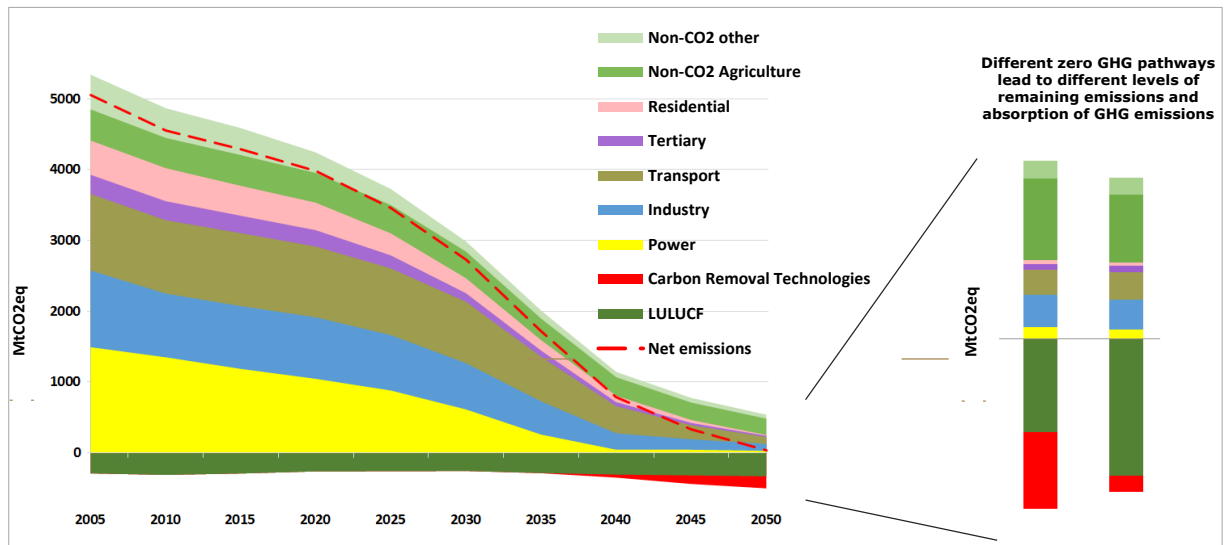


Action on the **Global Climate Action Agenda** built on the September Global Climate Action Summit in San Francisco. It included:

1. An "inclusive multilateralism" high-level event opened by UN Secretary General Antonio Guterres.
2. A Yearbook and Climate Action Platform showcasing voluntary action by cities, regions, businesses and other non-state actors, including in the Global South (currently 20,000 individual and collaborative actions are registered).
3. Parties and non-party stakeholders committing to scale up global climate action in 2019 with a refreshed, effective Action Agenda.

Action by the European Union ‘A Clean Planet for all’ is the title of the EU’s long-term vision for a prosperous, modern, competitive and climate neutral economy. Its vision for the EU by 2050 includes:

- A clean energy transition and GHG emissions reduction with ambitious 2030 targets.
- Radical transformations necessary: central role of energy system, buildings, transport, industry, agriculture.
- A non-Paris Agreement compliant plan for 60% reductions in 2050 per current policies supplemented by proposed pathways for achieving a climate neutral EU. These pathways are challenging but feasible from a technological, economic, environmental and social perspective. They lead to projected path to carbon neutrality:



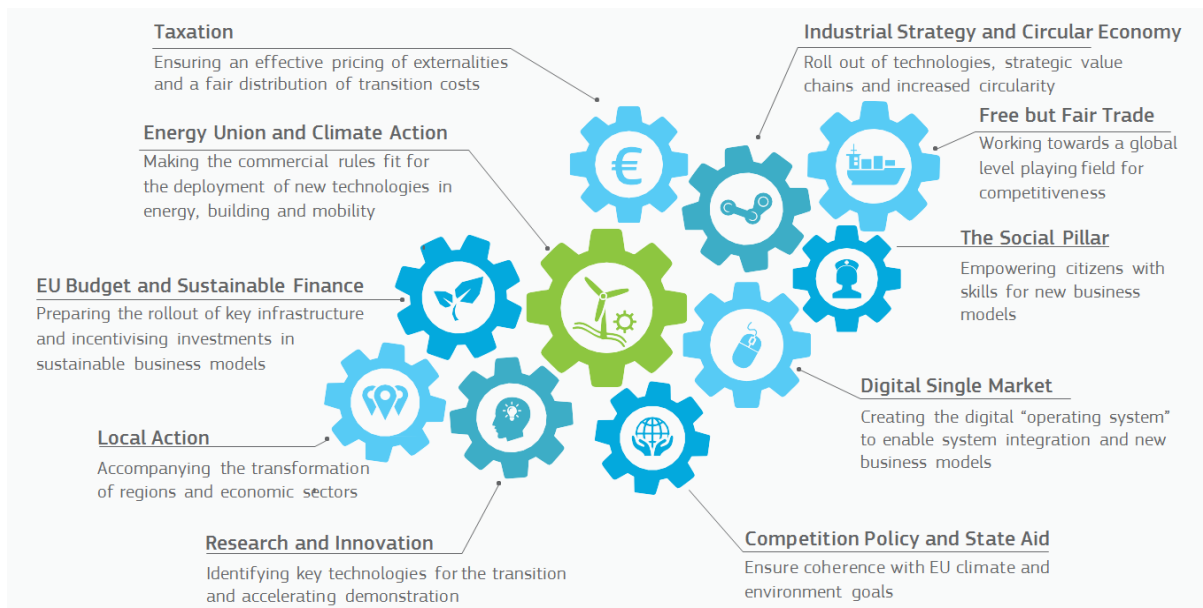
The pathways to carbon neutrality are based on detailed assessment supported by scenario analysis

Long Term Strategy Options								
	Electrification (ELEC)	Hydrogen (H2)	Power-to-X (P2X)	Energy Efficiency (EE)	Circular Economy (CIRC)	Combination (COMBO)	1.5°C Technical (1.5TECH)	1.5°C Sustainable Lifestyles (1.5LIFE)
Main Drivers	Electrification in all sectors	Hydrogen in industry, transport and buildings	E-fuels in industry, transport and buildings	Pursuing deep energy efficiency in all sectors	Increased resource and material efficiency	Cost-efficient combination of options from 2°C scenarios	Based on COMBO with more BECCS, CCS	Based on COMBO and CIRC with lifestyle changes
GHG target in 2050	-80% GHG (excluding sinks) ["well below 2°C" ambition]					-90% GHG (incl. sinks)	-100% GHG (incl. sinks) ["1.5°C" ambition]	
Major Common Assumptions	<ul style="list-style-type: none"> Higher energy efficiency post 2030 Deployment of sustainable, advanced biofuels Moderate circular economy measures Digitisation 				<ul style="list-style-type: none"> Market coordination for infrastructure deployment BECCS present only post-2050 in 2°C scenarios Significant learning by doing for low carbon technologies Significant improvements in the efficiency of the transport system. 			
Power sector	Power is nearly decarbonised by 2050. Strong penetration of RES facilitated by system optimization (demand-side response, storage, interconnections, role of prosumers). Nuclear still plays a role in the power sector and CCS deployment faces limitations.							
Industry	Electrification of processes	Use of H2 in targeted applications	Use of e-gas in targeted applications	Reducing energy demand via Energy Efficiency	Higher recycling rates, material substitution, circular measures	Combination of most Cost-efficient options from "well below 2°C" scenarios with targeted application (excluding CIRC)	COMBO but stronger	CIRC+COMBO but stronger
Buildings	Increased deployment of heat pumps	Deployment of H2 for heating	Deployment of e-gas for heating	Increased renovation rates and depth	Sustainable buildings			CIRC+COMBO but stronger
Transport sector	Faster electrification for all transport modes	H2 deployment for HDVs and some for LDVs	E-fuels deployment for all modes	Increased modal shift	Mobility as a service			<ul style="list-style-type: none"> CIRC+COMBO but stronger Alternatives to air travel
Other Drivers		H2 in gas distribution grid	E-gas in gas distribution grid			Limited enhancement natural sink	<ul style="list-style-type: none"> Dietary changes Enhancement natural sink 	

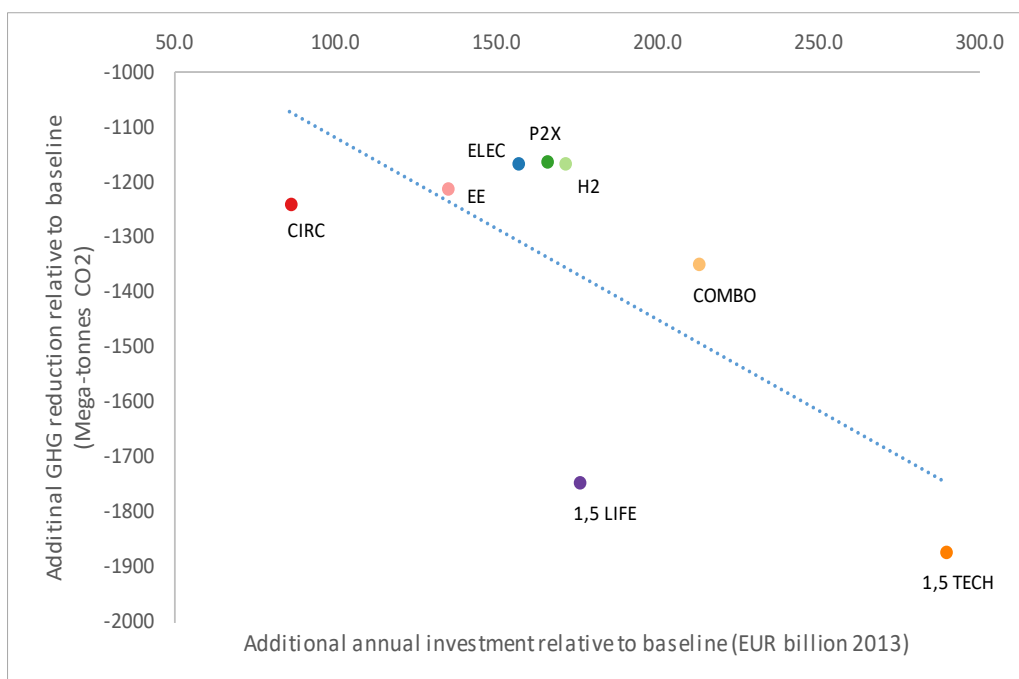
The seven key building blocks are:

1. Energy efficiency
2. Deployments of renewables
3. Clean, safe & connected mobility
4. Competitive industry and circular economy
5. Infrastructure and inter-connections
6. Bio-economy and natural carbon sinks
7. Tackle remaining emissions with carbon capture and storage

An enabling framework is crucial to deliver the transformation:



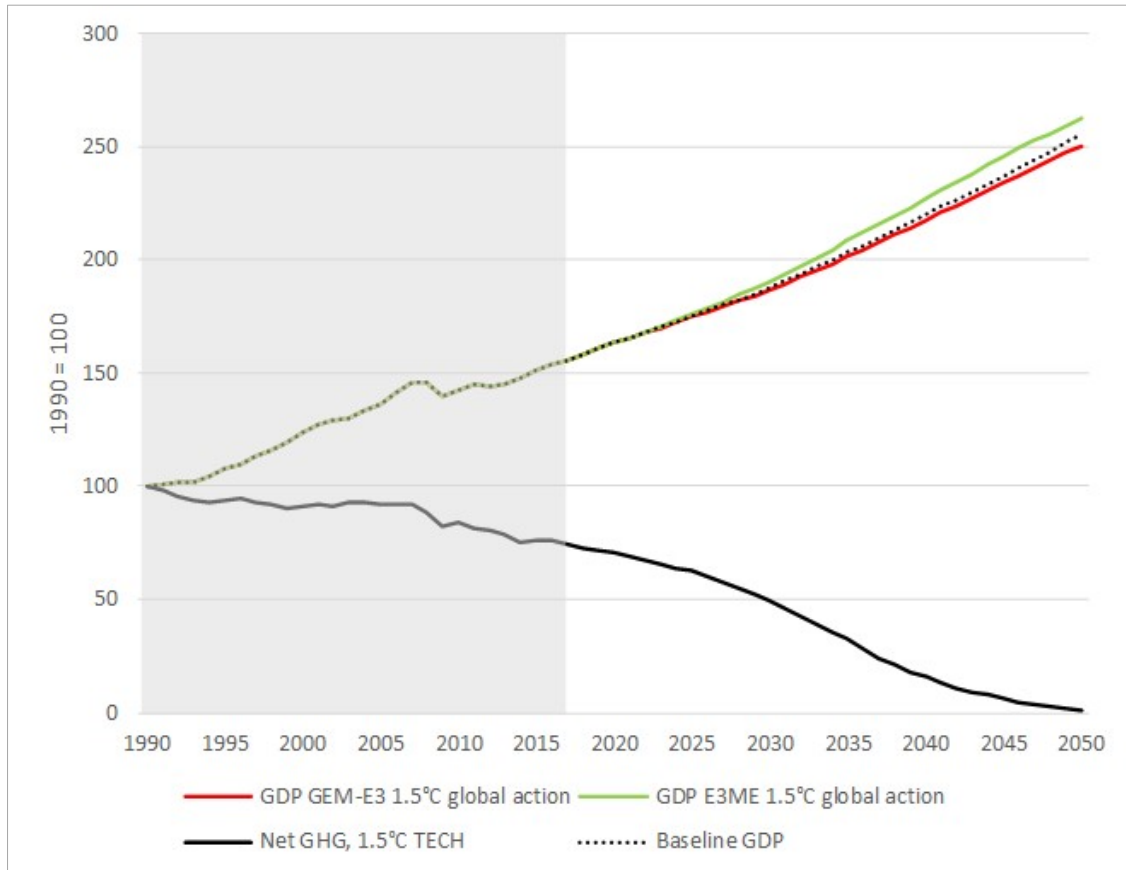
The additional Investment across the EU needed for different scenarios is:



Achieving a net-zero greenhouse gas emissions economy by 2050 requires increasing the EU's investment in energy systems from 2% of GDP to 2.8% (€ 575 bn per annum).

Co-benefits include:

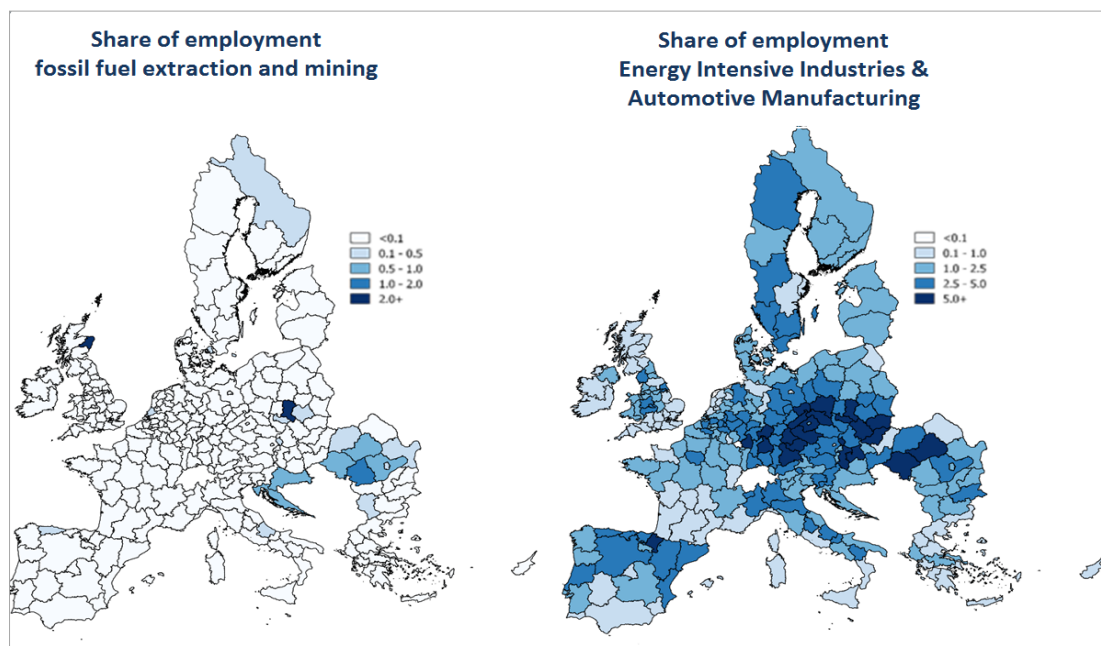
- Modernising and decarbonizing the EU's economy will stimulate significant additional investment
- Positive for growth and jobs, with GDP impacts moderate and some projections showing growth up to 2% in 2050
- Reduced energy imports
- Improved public health.



Just Transition

The overall economic impacts of the deep transformation are positive with growth in new sectors. 'Green jobs' already represent 4 million jobs in the EU. But some sectors will face challenges (e.g. coal mining and fuel extraction) and others will need to transform (e.g. energy-intensive industries and automotive sector). This will affect some regions more than others.

This transition has to be managed so it is a **'Just Transition'** with no-one left behind. The EU budget, employment and cohesion policies must achieve this. Training in new skill is key. Regions affected are shown by these maps:



Developing 2050 plans includes global and local dimensions

- **Role for energy and climate diplomacy** but also other political dialogues, security and development cooperation to prepare for geopolitical and geo-economic shifts.
- **Trade policy to promote uptake new technologies**, ensure right to fair access to all markets and critical raw materials. Role of EU's standards on products improving product efficiency on global markets.
- **Citizens and consumers** to embrace change and get engaged. Personal lifestyle choices can make a real difference, while improving quality of life.
- **Cities** are already the laboratories for transformative and sustainable solutions. Better spatial planning can improve living conditions and increase energy and CO2 efficiency.
- Improved **planning and public infrastructure** is needed withstand more extreme weather events.

The EU's next steps

- National Energy and Climate Plans are under development for 2030. Stakeholders will be involved in developing these into vision on 2050 which will enrich the debate. This will include societal debate in 2019 with national parliaments, business, non-governmental organisations, trade unions, cities and communities, as well as citizens and the youth.
- The objective is for the EU to adopt and submit an ambitious strategy by early 2020 to the UNFCCC as requested under the Paris Agreement. In doing so it hopes to show leadership and work with other parties to do adopt similar plans.

Hong Kong perspectives

Dr. Agnes Wong

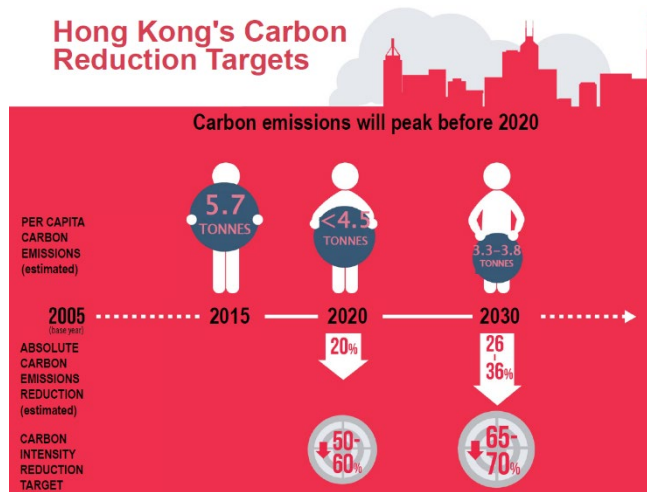
Environmental Protection Department of the HKSAR Government

Dr Agnes Wong noted:

Hong Kong's January 2017 2030+ plan committed to (see the right):

Hong Kong's actions on climate change include:

- **Mitigation:** reducing carbon emissions from electricity generation by phasing down coal fired electricity generation, reducing emissions from the transport sector, enhancing building energy efficiency and encouraging a less wasteful and more energy efficient lifestyle.
- **Adaptation and resilience action:** improving urban planning, nature conservation and drainage and flood management, etc.

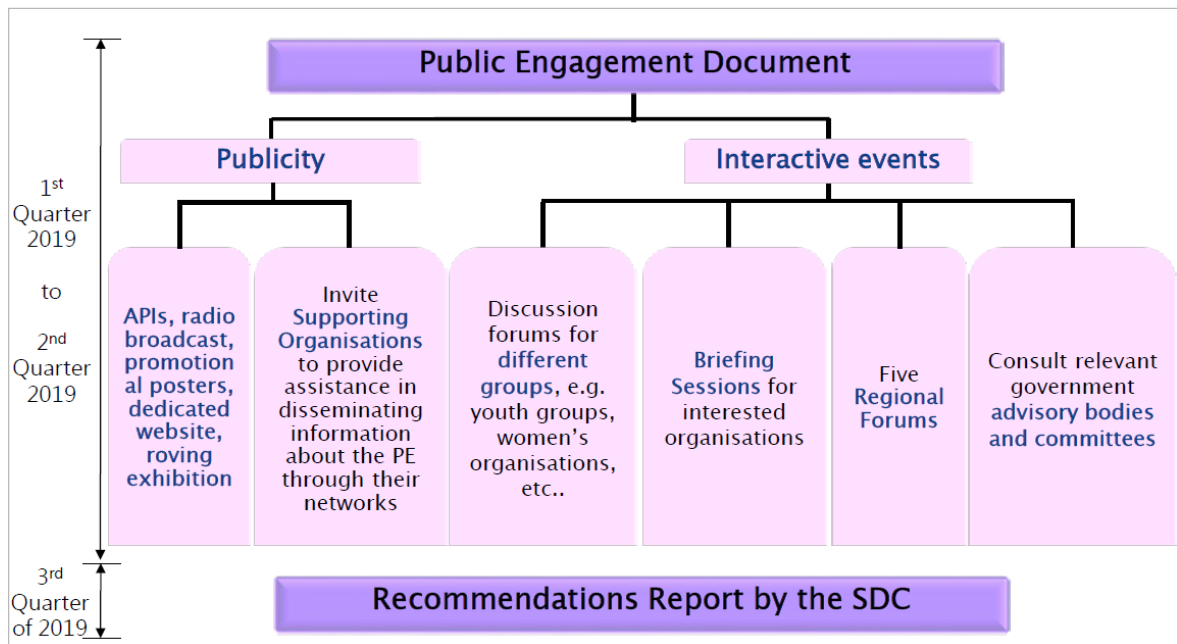


Per the Paris Agreement the Hong Kong SAR Government will develop its long-term decarbonization strategy up to 2050 by 2020 and submit it to the Central People's Government, which will then put forward the strategy to the secretariat of the United Nations Framework Convention on Climate Change. The Government has therefore invited the Council for Sustainable Development to conduct a public engagement exercise covering:



- Carbon reduction required to comply with Paris Agreement target.
- Further reducing carbon emissions from electricity generation.
- Improving building energy efficiency
- Encouraging people to adopt a low-carbon lifestyle

The process for this public engagement will include:



Panel 1 Question & Answer Session

As a way of explaining how the Paris Agreement needs to work, Robert Gibson asked people to imagine that 190+ people go to an expensive Chinese Banquet. Prior to going each pledge the amount they will pay. Part the way through the meal they are shown what each individual has pledged and the shortfall of this from the cost of the banquet. There then needs to be a process where they agree how much extra each person will pay to bridge the gap. The Transparency Mechanisms and Global Stocktake in the Paris Agreement Rulebook give this process. He asked the panelists for their thoughts on this.



- **Prof Ye QI** agreed with the way the Paris Agreement process was described. He thought the current large climate conferences do not work well. The UN should, instead, set global targets and lead governments in getting their businesses and citizens to play their role in meeting these targets. The UN has done this well with its Sustainable Development Goals [from 2015 to 2030] and previously with its Millennium Development Goals [for 2000 to 2015]. The UN, with all the countries of the world as its members, is the best and only organization set global targets.
- **Vicky Pollard:** Agreed the Chinese Banquet is a good analogy. She noted:
 - There is a lot of work 'behind the scenes' to reduce carbon emissions. Some countries have already 'put themselves on a diet' which means the banquet will cost less.
 - The EU has legislation in place for meeting its 2030 45% carbon reduction target and is confident of achieving this.
 - China has been doing its homework. It is starting a carbon market for its Power Sector with a testing phase this year and full compliance next year. Its 19th December 2017 State Council legislation is clear that while the power

sector is the first sector, other sectors will come in. The preparatory MRV and registry work is being done on all eight sectors.

- Countries which take action make it easier for others to see how they can contribute their share.

As a question from the audience, **Jonathan Drew** noted the risk that the attendees at the banquet would leave the restaurant without paying the bill. For climate change this means a bankrupt ecosystem to the detriment of our children. He asked: *How can we change the behavior of today's leaders to better take into account the interests of future generations?*

Response:

- **Vicky Pollard:** Many leaders come from the older generation and getting their attention can be difficult. Having the 'Youth Voice' at COP24 was helpful. The youth voice is becoming greater in Europe. For example, a 'class action' lawsuit is being taken in France arguing that not enough is being done on climate change.
- **Prof Ye QI:** Yes, leaders should be asked for stronger leaderships on tackling climate change. But we should not just look at the leaders. We should increase focus on all sectors of the economy and social organizations and individual citizens taking a lead.

Question: Please can the panel comment on how the following will help meet the target:

- The global demographic shift to more old people plus some countries having declining populations. Responses:
 - **Vicky Pollard** agreed that demography will have significant impacts and more work needs to be done on its impacts. Issues include: (1) How older people will wish to live; (2) Some countries needing to attract immigrants to care for the elderly.
- Technology changes which reduce energy consumption in cars. Responses:
 - **Vicky Pollard** noted the large EV100 meeting held in Beijing earlier this month highlighted the rapid progress on electric vehicles (EVs). Last year sales of EVs increased in China while the total sales of cars reduced. There are many aspects to the technology change including (1) new car models; (2) new business models such as greater car-sharing; and, (3) integration of the grid with cars being used for electricity storage.
 - **Agnes Wong:** The HK government has put in place a Green Pilot Transport Fund to subsidise the testing of green innovative technologies.
- Having a Global Carbon market
 - **Prof Ye QI** noted carbon markets are great in theory but so far not one, including the EU, is working well. Consideration also needs to be given to a carbon tax.

Question from Michael Edesess: This forum, as with many on climate change, has not mentioned nuclear power. Yet it is the chief technology for carbon neutral electricity

generation. Given the seriousness of the climate challenge should the regulations on nuclear be relaxed somewhat? We have got used to accepting the occasional commercial aircraft crash because we know they are very rare. Similarly, should there be tolerance for rare nuclear accidents? Why isn't there more discussion of this? It is a matter of balancing risks.

Responses:

- **Vicky Pollard:** In the EU, different states have different policies on nuclear. So, EU level work is only on nuclear safety and how to deal with nuclear waste. The EU's modelling sees most of the change needed for carbon neutrality coming from improved efficiency reducing demand and from increased renewable energy. Nuclear has a role but not a large one. It is not acceptable to reduce nuclear safety standards. China has new investment in nuclear but there is now more debate on where the plants can be sited.
- **Agnes Wong:** HK gets 25% of its electricity from nuclear and has to think about how to eliminate carbon emissions from the rest of its electricity generation. It is looking to increase the use of renewables but potential is limited.
- **Prof Ye Qi:** China has always had nuclear on its agenda. When planning for its 2014 discussions with the USA it included 100 to 150 GW of new nuclear. It has scaled its nuclear investment plans down due to (1) making a thorough review following Fukushima; and, (2) its projections now suggest this amount of nuclear is not needed given the rapid cost reduction in Wind and Solar power. The issues of distribution risk and intergenerational risks are also important.

Comment from Magnus Bartlett: While much that HK does is good, we are not facing up to the threats from climate change. We should plan for 3C temperature rise and much more than 1 meter of sea level rise. The resulting work required will be a great business opportunity and create lots of jobs. Let's embrace this.

Question: Cities are among the largest consumers and have examples of leadership on reducing carbon emissions. What should be the role cities in reducing carbon emissions and creating the governance for achieving this?

Response:

- **Prof Ye Qi:** The September 2018 Global Climate Action Summit in California highlighted the importance of cities. Globally they have 60% population, 70% of energy consumption and 80% of carbon emissions. Cities have, however, many issues to deal with. In China, a Mayor as a long list of issues to manage with climate change not being near the top. Plans for climate change action have been prepared for some cities but not implemented due to change in Mayors. Action is needed to raise its priority.
- **Agnes Wong:** Hong Kong will shortly have a public engagement exercise on long-term decarbonization strategy. This will both educate the general public and listen to gauge views.

- **Vicky Pollard:** We have intense cooperation between cities in Europe and cities in China. In China some cities are the size of nation states elsewhere in the world. Being 'closer to the ground' cities have the opportunity to take cross-sectoral action. Funding is needed for pilots so rapid progress can be made.

PANEL 2 – WHAT POINTERS DOES COP24 GIVE THE PRIVATE SECTOR ON ACTION TO DE-CARBONISING HONG KONG?

Engineering Hong Kong becoming a low carbon, smart and resilient city

Dr Bruce CHONG

ARUP

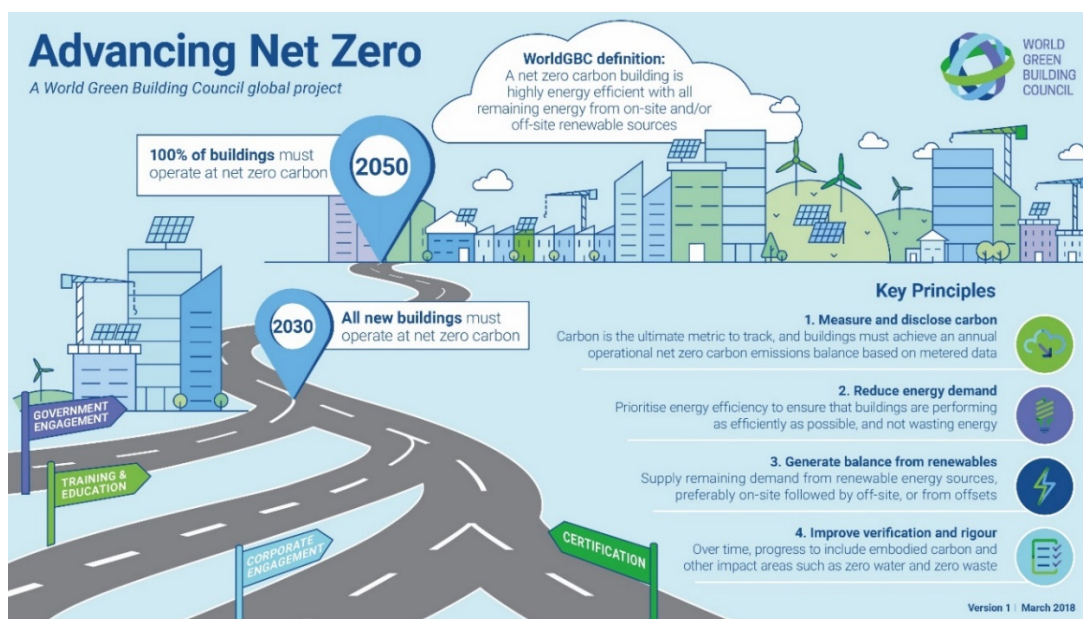
Bruce noted:

1. The following cities have now signed the declaration of the Carbon Neutrality Coalition¹ which was launched at the One Planet Summit in December 2017:

Austin, Accra, Barcelona, Berlin, Boston, Buenos Aires, Cape Town, Caracas, Copenhagen, Durban, London, Los Angeles, Melbourne, Mexico City, Milan, New York Oslo, Paris, Philadelphia, Portland, Quito, Rio de Janeiro, Salvador, San Francisco, Santiago, Seattle, Stockholm, Sydney, Toronto, Vancouver, Washington and Yokohama.



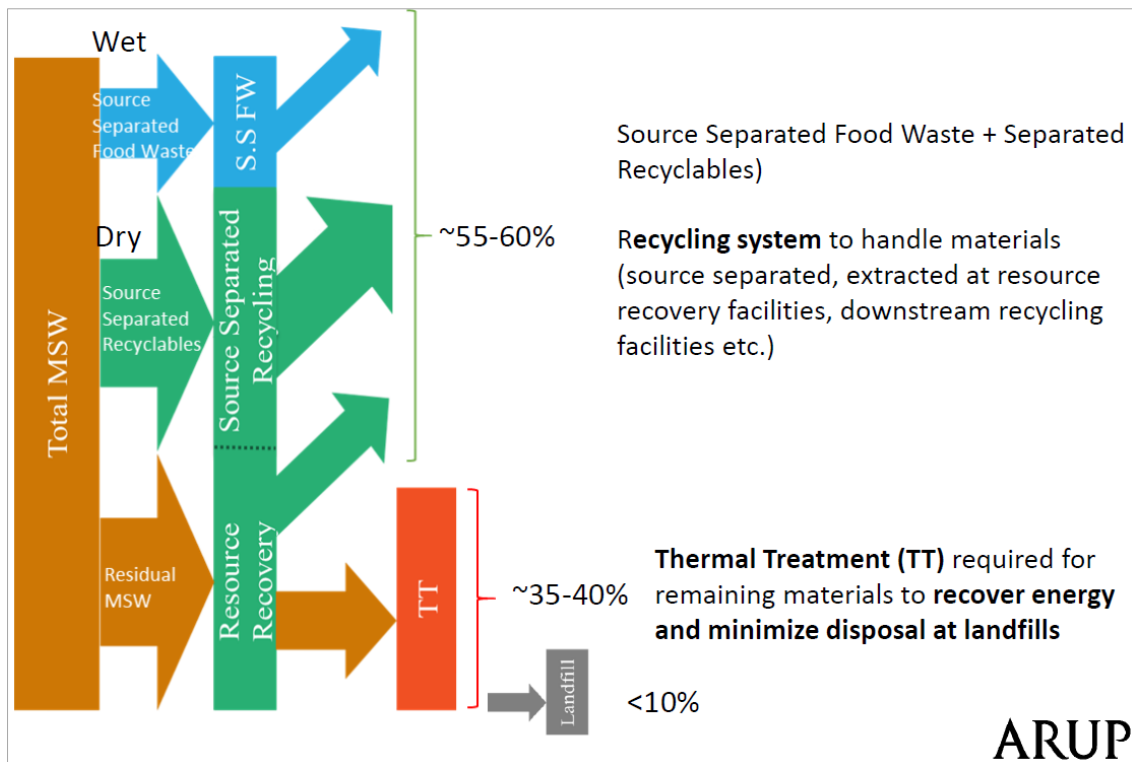
2. Twenty-two cities have committed to the World Green Building Council's Advancing Net Zero project:



¹ The Carbon Neutral Coalition: www.carbon-neutrality.global/plan-of-action/

Engineers can provide the solutions to achieve this carbon-neutrality. Areas of work:

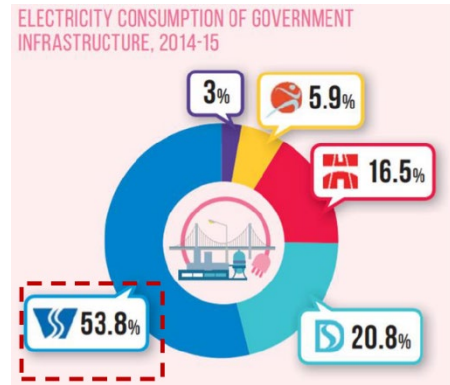
1. Decarbonizing electricity supply by:
 - a. Changing the sources of energy.
 - b. District energy systems. This may include Combined Heat & Power or Trigen as well as with micro-grids
 - c. Smart metering systems which enable demand management.
2. Reduced emissions from buildings by better design of new buildings and retrofitting old ones.
3. Reduce emissions for mobility by:
 - a. Enabling low-carbon modes of transport such as using public transport and walking rather than driving cars.
 - b. Introducing electric and biofuel vehicles not only private cars but also goods vehicles and refuse trucks.
4. Reducing emissions from waste material: The concept of circular economy should be fully embraced through better management systems at all levels from collection, separation, recovery and treatment. The key is to maximize separation of wet waste and dry recyclables at source by providing appropriate facilities and policy (e.g. MSW charging, PRS etc), provide sufficient facilities to turn collected wet waste and dry recyclables to useful materials; and harness thermal treatment facilities to capture energy from residual waste. As such, carbon emissions and waste to landfill can be largely reduced.



5. Reducing the substantial energy used in supplying water and handling waste water.

Action may include:

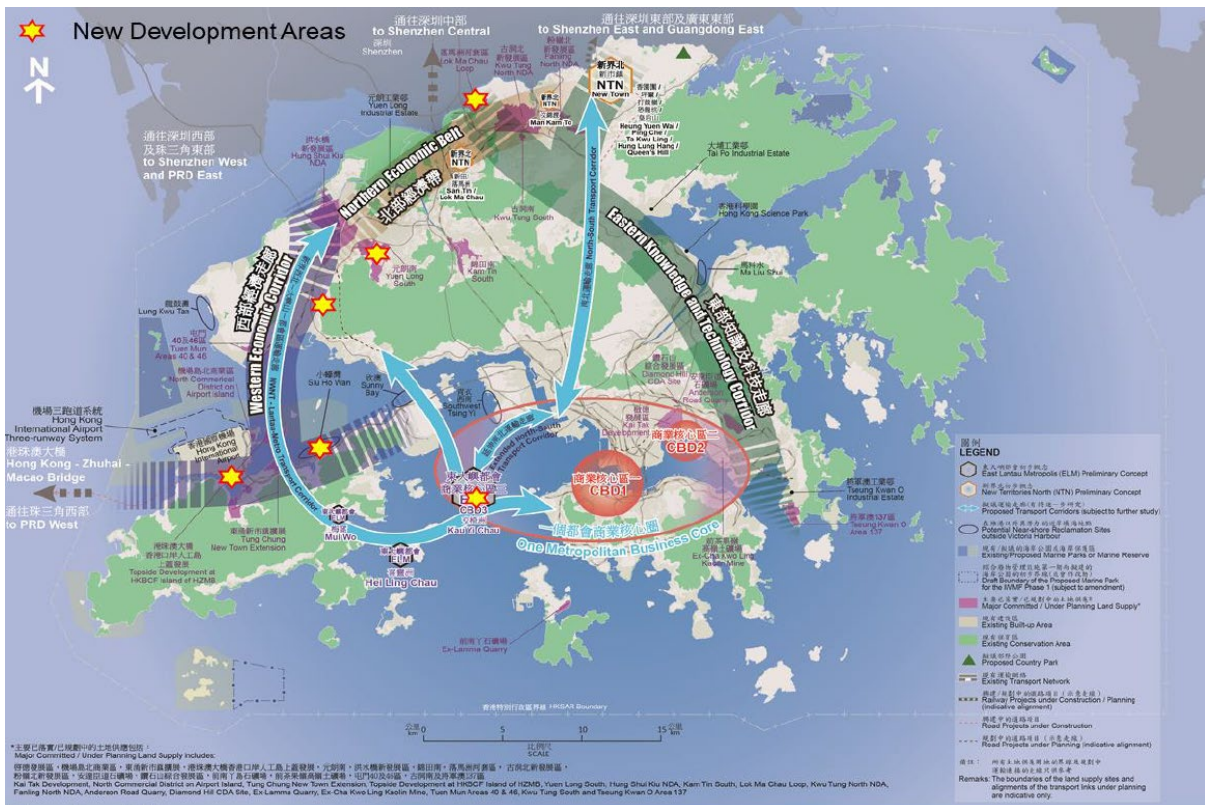
- Increasing water charges so people and businesses are more careful on the quantity they use.
- Better information from water metering
- Greater use of rainwater and grey (treated) waste water.
- Reducing water leakage.
- Arranging for more rainfall to be absorbed by the ground in the city. 'Sponge City'.



Town Planning is a key element of reducing a city's carbon emissions. It can:

- Enable wider use of renewable energy, energy efficient design/technology, green transport, more advanced recycling and waste management.
- Reduce the need for travel by positioning homes, schools and work places in close proximity.

The Hong Kong Government is working to achieve these benefits in the 'New Development Areas' – see map:



Financing action on climate change

Mr. Jonathan Drew

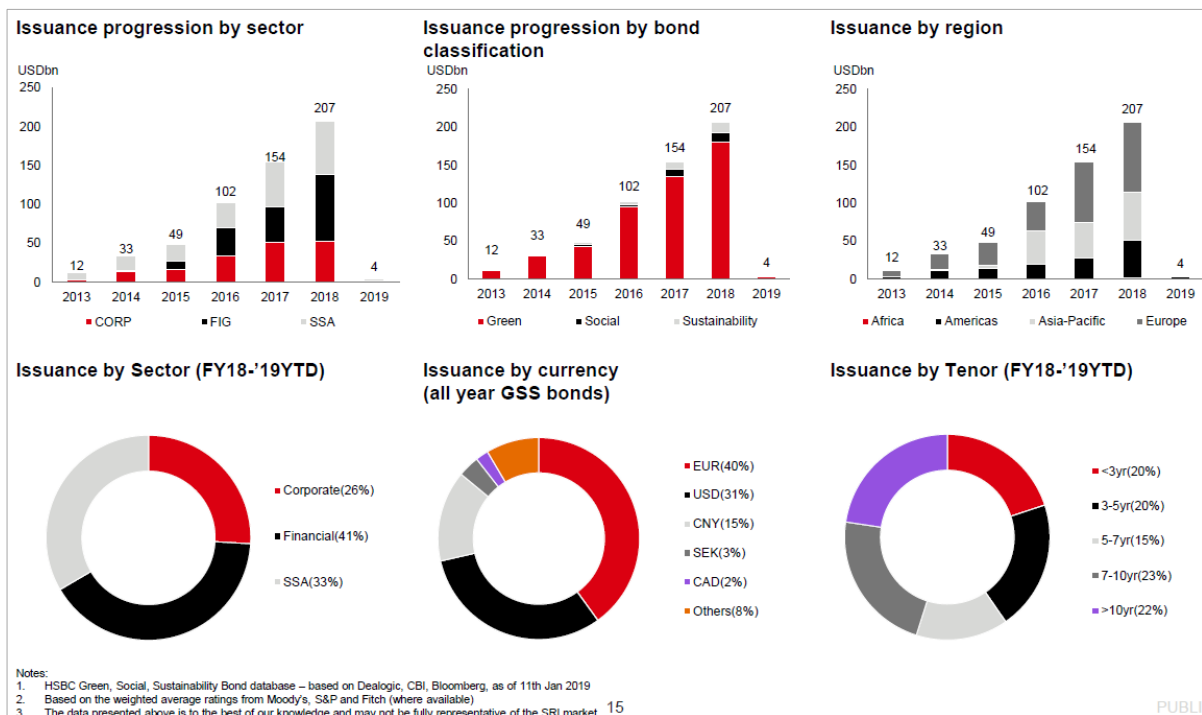
HSBC

Jonathan Drew reviewed progress made in raising 'green finance' during to 2018.

This included²:



1. Green, social or sustainable bonds issued during 2018:



- Within this HSBC alone completed 41 green/social labelled bonds and loans in 2018.
 - China raised US\$37.9 billion in 125 deals. This is 60% of APEC volume and 18% of global volume.
2. Regulatory developments:
 - China currently has optional ESG disclosure for listed companies and will make this mandatory in 2020.

² This information presented subject to HSBC's customary disclaimers.

- The Annual General Meeting³ of the Green and Social Bond Principles Association was held in Hong Kong in June 2018.
- The Hong Kong Green Finance Association (HKGFA) was launched on 21 Sept 2018 with the objective to promote HK as a regional green finance centre.
- The Securities and Futures commission's September 2018 recommendations for a strategic framework for the development of green finance 'green finance' in Hong Kong⁴ includes:
 - Enhancing listed companies' consistent and comparable disclosure of environmental information, with an emphasis on climate-related risks and opportunities.
 - Asset managers providing greater clarity to investors on how, and to what extent, they factor environmental criteria into their investment processes and risk assessments.
 - Continuing to promote green bonds.
 - Assisting the development of internationally-compatible disclosure guidance supporting the credibility of green product offerings in Hong Kong.

³ AGM of the Green and Social Bond Principles organisation: www.icmagroup.org/events/PastEvents/2018-green-and-social-bond-principles-annual-general-meeting-and-conference/

⁴ SFC Green Finance announcement: www.sfc.hk/edistributionWeb/gateway/EN/news-and-announcements/news/doc?refNo=18PR110

How Hong Kong can obtain carbon neutral electricity – including implications of Shell’s SKY scenario

Eurling. Henry Wang

International Advisor & Author; Member, SOAS Advisory Board
London University

Henry Wang highlighted potential actions which HK should evaluate and take to achieve Carbon Neutral Energy by 2050/70 as required by the Paris Agreement. These potential options include:

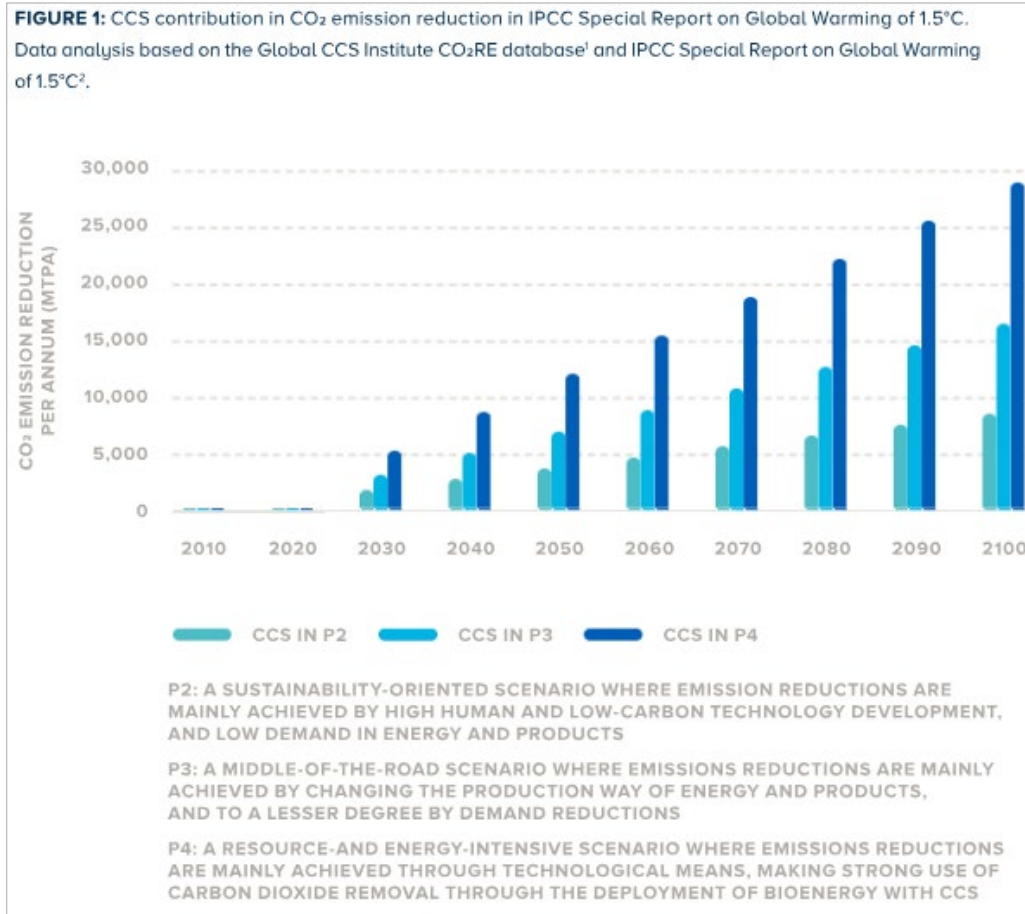


- Reducing the carbon intensity of electricity generation in Hong Kong by a combination of:
 - Importing low carbon electricity from Mainland China including renewables and additional nuclear with suitable safeguards.
 - Increased waste to energy generation in HK which will also solve the waste problems in HK.
 - Gas fired generation in Hong Kong if coupled with carbon capture and storage (CCS) plus carbon capture storage and utilization (CCSU)
 - Promoting renewables and clean energy power generation
- Improved energy efficiency in buildings, appliances and transport.
- Consideration of the new hydrogen economy and use of hydrogen manufactured by gas steam reforming or electrolysis, for the transport sector including cars, ships and heavy good vehicles.
- Smarter city designs.
- Improve Company reporting on their climate strategy as recommended by the G20 initiated Taskforce on Climate Related Financial Disclosure TCFD.

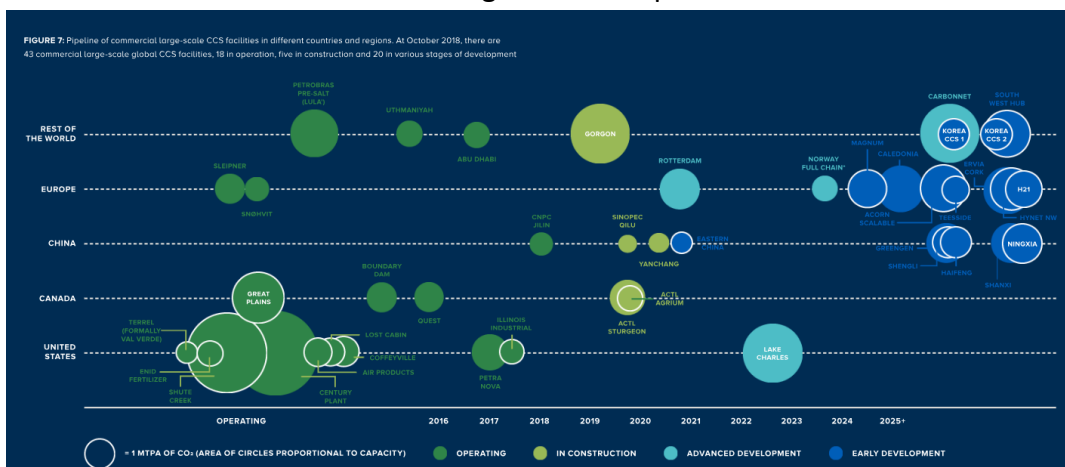
Many of the proposed new clean energy options are already being undertaken by other financial centers and countries globally. There have also been significant technological innovations and developments in renewable which would make them competitive against fossil energies by 2020. It is very important that Hong Kong evaluate these various options urgently so that they can develop a suitable new climate action plan for 2050 as required by the Paris Agreement. In addition, these are essential to Hong Kong’s sustainable development and continued competitiveness as an international financial centre.

Regarding carbon capture and storage (CCS) the Global Status Report⁵ published in December 2108 by The Global CCS Institute notes:

1. The IPCC 1.5°C report identifies CCS as being essential in all but the P1 scenario which includes extreme and unlikely, lifestyle changes:



2. There are now 18 commercial large-scale CCS facilities in operation, five under construction and 20 in various stages of development.



⁵ The Global CCS Institutes Status Report: <https://indd.adobe.com/view/2dab1be7-edd0-447d-b020-06242ea2cf3b>

3. Sufficient geological storage is available to achieve the objective of the Paris Agreement:

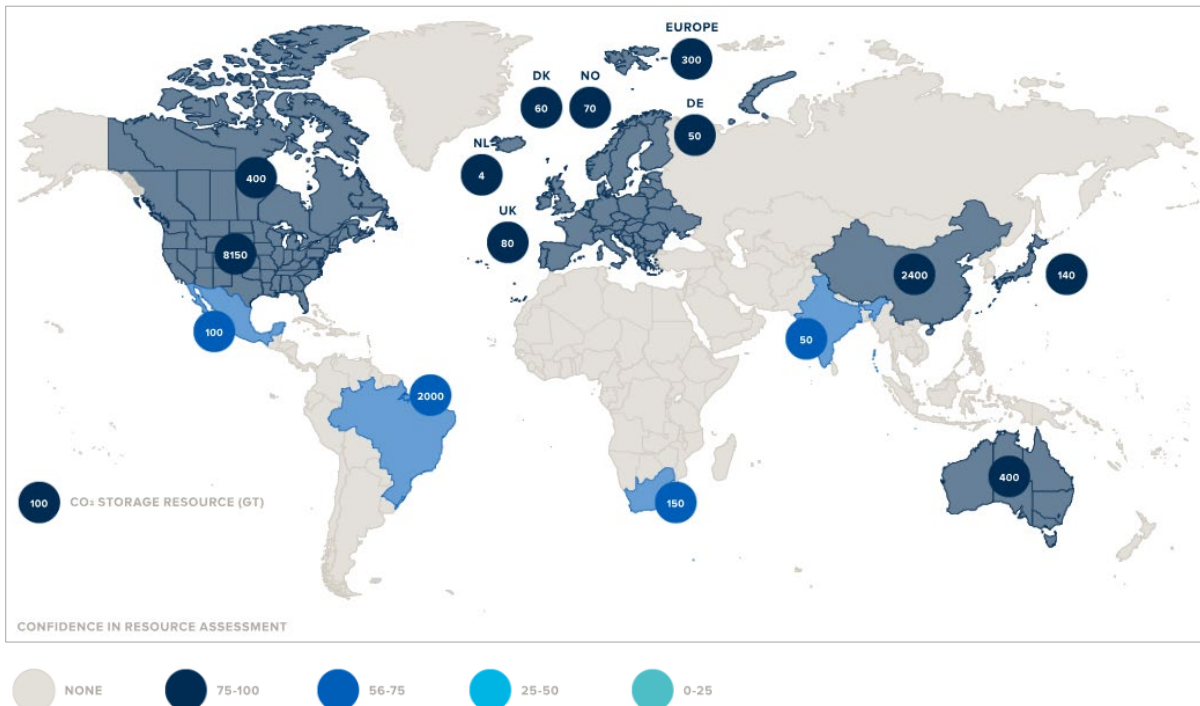
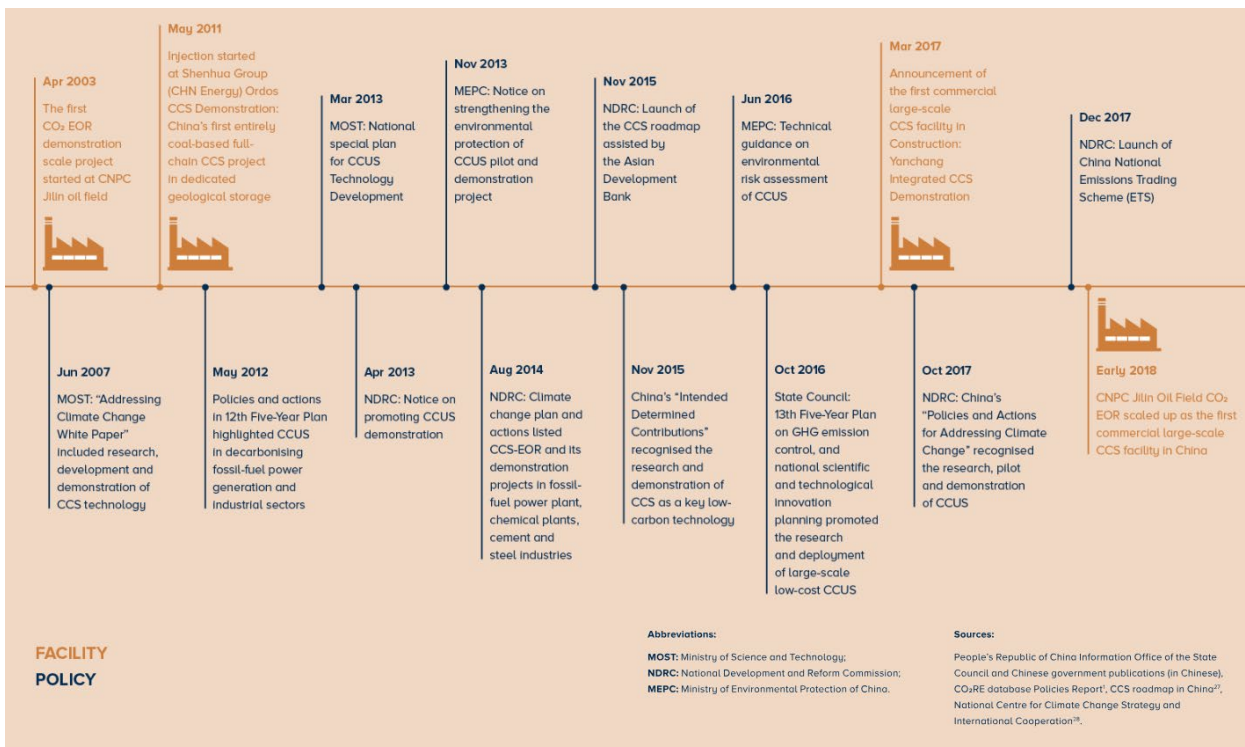


FIGURE 8: Global storage resource potential, based on the latest assessments

4. The timeline for CCS deployment in China is:



Hong Kong's Long-term decarbonization strategy

Prof. Lam Chiu-ying

Convenor, Support Group on Long-term Decarbonisation Strategy,
Council for Sustainable Development



Prof Lam spoke in his personal capacity rather than as the Convenor of the Support Group for the Council for Sustainable Development's public engagement on HK's long-term decarbonization strategy. He asked: **"How we can de-carbonize HK when it is packed with buildings and has people who are materialistic, consumeristic and capitalistic:**



- Making and spending money are people's main hobby
- People like shopping
- Many people treat having air conditioning as normal.
- Bright lights give prestige
- Driving a car gives status
- Eating out is common"

We need to reduce energy consumption in buildings and transport. Also in the amount of waste we produce.

Gains from lowering the carbon intensity of electricity and improving energy efficiency mean people will pay less for it and feel less guilty about their carbon footprint. This may lead to them using more: The **rebound effect**.

So we need to re-define quality of life and re-orient business objectives. This is not just a matter of technical solutions. Specific actions for individuals include:

- Using fans rather than air conditioning may save about 75% of electricity.
- Savings using public transport rather than private cars.
- Only buying what one needs. Buying quality not quantity.

Our government needs to '**mainstream Low-C into decisions**' with policies and strategies to:

- Replace air conditioning by ventilation.
- Reducing home-to-work travelling
- Cap the number of private cars and encourage low-carbon cars.
- Reducing un-needed lighting

Our businesses need to mainstream Low-C in their business plans and operations. Focus on selling Quality rather than Quantity. Optimize building, manufacturing / sourcing and logistics for energy / carbon reduction.

Panel 2 Question & Answer Session

Simon Ng noted the IPCC report published in October 2018 advised stopping temperature increase at 1.5°C requires far-reaching transformation of our economy. Would each panellist comment on what ‘low-hanging’ solutions to go after in the short-term? Also what big changes should we go for and what can be done on behavioural change?



- **Bruce Chong:**
 - **Electricity use in buildings:** We can look for reducing the emissions intensity of power generation by half and improving the energy efficiency of the building sector by half. Together these will give a 45% to 50% cut in HK’s total GHG emissions. This would require regulations by government and hard action by the private sector.
 - **Waste:** We currently don’t have the right facilities for implementing the hierarchy of waste management. Specifically, we don’t have: (1) for separating ‘wet’ (food) and ‘dry’ recyclables; and, (2) waste to energy plants. Also, we should speed up relevant policies including charging for waste collection and PRS (Producer Responsibility Schemes).
- **Lam Chiu-ying:**
 - The technical solutions are necessary. The government should push really hard on retrofitting old buildings and requiring new buildings to be energy efficient. The government may be reluctant to push the retrofitting of old buildings as people will then ask it to pay for the retrofit but this doesn’t alter the need for action.
 - But technology is not the only solution. Younger people (say 40 or less) are willing to take personal action. But for this we need publicity to help people understand how they can make a difference. For example, to quote Stern: *‘If investors and companies incorporate decarbonization messages into the brand*

marketing they can induce people to take actions which are very positive to climate change.'

- **Henry Wang:**

- We can all have a role in advocating government policies. For example, he has been involved in providing advice in a working group for the UK's Climate Change Committee and for a working group looking at capture and storage of CO₂. The forthcoming HK Government public engagement on HK's Long Term Decarbonisation Strategy is an opportunity to make our views known.

Intervention by Prof Ye QI:

Comment: In 2017 a Keeling Curve prize fund⁶ was set up for solutions which can reduce CO₂ emissions. Do tell people about this as there have been relatively few applications from East Asia.

Question: Why is air-conditioning in HK often seems so cold – perhaps 18°C? HK is not following its government's guideline of 25.5°C indoor air temperatures. He proposed all the people in the room should participate in a coordinated push to make it operational. In Beijing the government sets the standard at 26C in the summer.

Response:

- **Lam Chiu-Ying:** Agreed that having the air-conditioning very cold is a problem in HK. In Japan Government Offices are at 28°C in the summer. People dress appropriately and do not seem to have a problem with this temperature. Reasons why HK has cold air-conditioning include (1) Shopping mall's research shows people buy more when it is cold so they run their shopping centres cold; (2) Some people believe it is more hygienic when the air-conditioning is cold. To overcome these 'social issues' we need 'social engineering' with government research and public education on the impact of temperature on health and government regulation on the minimum temperature in shopping malls and other spaces.
- **Bruce Chong:** Better insulation with double glazing will help reduce energy consumption both in the summer when it is hot and, when it is cold in the winter.
- **Robert Gibson:** There are two reasons why it is more efficient for large buildings to have a central air intake rather than allow windows to be opened. First, a heat exchange can be arranged so the exiting cold air cools down the incoming hot air. Secondly, a central entry point can optimize the amount of air brought into the building and hence the energy needed to cool and dehumidify it.
- **Cary Chan, Executive Director of the HK Green Building Council noted:**
 - Human thermal comfort is impacted by three things: temperature, humidity and wind-speed. HK can get more efficient space conditioning if it reduces humidity to 60% and operates at a higher temperature. Also having fans for air-movement

⁶ The Keeling Curve Prize www.kcurveprize.org has multiple funding rounds each with a number of prizes.

makes higher temperatures comfortable. Lower humidity makes for more hygienic environments.

- Health issues are complex. Prolonged exposure to cold air can be detrimental. Exposure to frequent large changes in temperature can also be detrimental.
- One option for large buildings is to have different zones. Offices where people stay for a long-time may be at a lower temperature than corridors which they pass through quickly.

Question from David Dodwell who asked for the panel's thoughts on two issues:

- Our problem is not agreement on the science but communicating the scale of the problem to ordinary people. Scientists, viz the IPCC's 1.5°C report, have a clear understand of the enormous climate change challenge we face. Many Businesses have a deep understanding of the issues and are planning how they should change. But most of the public do not clearly understand the issues or know what to do. Given this I believe the priority for the Government's Public Engagement should be a discussion with people who already have a level of technocratic expertise. These people can then help communicate to the general public.
- Secondly, I believe nuclear has to be a much bigger part of the solution. A book: '**A Bright Future**⁷' has just been published. Its overall conclusion is '**Decarbonize electricity. Electrify everything**'. It considers the myths around the problems with nuclear and the shortcomings of high reliance on renewables. It gives examples of countries which have embraced nuclear are much further down the path to decarbonization.

Responses:

- **Lam Chiu-Ying** noted communication on climate science is difficult. Should one alarm people making them afraid of the problem or ask them to take action because they love their children? That is: Whether to work through fear or through love? My approach is to encourage people to take action because they love their children and the world we live in. I believe it has a longer-lasting impact.
- **Bruce Chong** thought the public engagement should cover:
 1. Redefining what is success in HK. Especially what is success in life for the younger generation.
 2. Making clear the technological solutions which are available to help HK decarbonize.
- **Magnus Bartlett**: Evolution has given us fear to help us get out of trouble. If a truck coming towards you on the road and you have your grandchild by the hand, then fear is the stimulus that helps you get out of the way. At the same time, we people need to understand technological advancement gives real hope of over-coming problems. We just need to work hard enough at the technological improvements.

⁷ www.brightfuturebook.com A Bright Future. How some countries have solved climate change and the rest can follow by Joshua S. Goldstein and Staffan A. Qvist

- **Mike Kilburn:** We are in trouble [because of climate change] and need to do things urgently. Yes, we can phrase this as ‘If you love your grandchild be afraid for their future and take action’. We also need to phrase the case for action in a way which is relevant to key decision makers. For example, the Airport Authority has commissioned a study on climate adaptation given specific scenarios of how climate change might impact airport operations.

Responses on nuclear power:

- **Henry Wang:** Costa Rica is already running on 100% renewable power. Other countries should be able to achieve carbon neutral electricity but may need different energy sources given their circumstances. Solar and Wind generation cost have come down rapidly and are projected to soon be competitive with both nuclear and fossil power. Bruce Chong queried whether HK has sufficient land space for wind and solar. Henry Wang responded that Concentrated Solar Power used less land and is operating in the Middle East.
- **Vicky Pollard** noted that while nuclear power remained around 20% of electricity generation up to 2050 in the EU’s projections, renewable costs were coming down so much that this level of nuclear may not be necessary.
- **Mike Kilburn:** A key for HK’s future electricity supply is connection to China’s grid. China is developing both nuclear and renewables on a large scale.

Closing remarks

Mr. Simon Ng

Business Environment Council

Now that COP24 has given us the Rulebook for the Paris Agreement we must look for joined-up, scaled-up action involving Government, Businesses, NGOs, academics and citizens to reduce greenhouse gas emissions. He noted:

- HKUST recently held a Climate Change Adaptation and Resilience Conference.
- Civic Exchange is working with WRI on a ‘HK2050isNOW’ project looking at key actions for making HK carbon neutral by 2050.
- BEC is working with its members on setting carbon reduction targets.

That said we need to do more. Please share the need for action with your colleagues and friends. We owe it to the younger generation. Also please respond to the forthcoming public engagement by the Sustainable Development Council on HK’s Long-term Decarbonization strategy.



The views expressed in this summary report are those of the speakers and moderator, and do not necessarily represent the opinions of the event organizers.