

**THE CHINA COUNCIL
FOR INTERNATIONAL COOPERATION
ON ENVIRONMENT AND DEVELOPMENT**

THE FIRST MEETING OF THE SIXTH PHASE

Diaoyutai State Guesthouse, Beijing

December 9 – 11, 2017

Summary Record

March 2018

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ABBREVIATIONS

ADB	Asian Development Bank
AGM	Annual general meeting
AIIB	Asian Infrastructure Investment Bank
APEC	Asia-Pacific Economic Cooperation forum
ASEAN	Association of Southeast Asian Nations
CCICED	China Council for International Cooperation on Environment and Development
CFDA	China Food and Drug Administration
CO ₂	Carbon dioxide
EPA	Environment Protection Agency
ETS	Emissions Trading System
EU	European Union
FYP	Five-Year Plan
GDP	Gross domestic product
GGGI	Global Green Growth Institute
GHG	Greenhouse gases
HFC	Hydrofluorocarbons
ICAO	International Civil Aviation Organization
IEA	International Energy Agency
INDCs	Intended Nationally Determined Contributions
MDG	Millennium Development Goal
MEP	Ministry of Environmental Protection
MRV	Measurement, Reporting and Verification
NDRC	National Development and Reform Commission
NGO	Non-governmental organization
OBOR	One Belt, One Road; also known as Belt and Road Initiative
OECD	Organization for Economic Co-operation and Development PM Particulate matter
PPP	Public-private partnership
PV	Photovoltaics
RMB	Renminbi, China's currency
SDG	Sustainable Development Goal
SERI	CCICED Secretariat
SISO	CCICED Secretariat International Support Office
SLCP	Short-lived climate pollutant
SSEZ	Sihanoukville Special Economic Zone
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
WEF	World Economic Forum

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Ecological Civilization in Action: A Common Green Future for a New Era

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I. Introduction

The China Council for International Cooperation on Environment and Development ("the Council" or CCICED) was established in 1992 by China's State Council to foster cooperation in the areas of environment and development between China and the international community.

The Council is a high-level advisory body that puts forth recommendations on the environment and sustainable development for the Chinese government's consideration. It has so far convened 26 annual meetings organized into five-year phases.

The Council supports the development of a comprehensive approach to sustainable development and environment through close cooperation between China and other countries. At present, the Council is composed of 65 members from China and around the globe, who were chosen for their experience, expertise and influence.

The Council is chaired by Vice Premier of the State Council, Zhang Gaoli. It was at his invitation that the members of the Council attended the first meeting of Phase VI. The CCICED executive committee serves as the executive body of the Council.

The Council's host institution is the Ministry of Environmental Protection (MEP). Previously known as the State Environmental Protection Administration, MEP is responsible for the Council and for ensuring inter-ministerial coordination. It has established the CCICED Secretariat to support international and domestic contacts. The Secretariat supports follow-up in China to CCICED recommendations and deals with routine matters when the Council is not in session.

The Secretariat is assisted by the Secretariat International Support Office (SISO), directed by Ms. Lucie McNeill and located at Simon Fraser University in Burnaby, Canada. Until April 2013, SISO was funded by the Canadian International Development Agency, afterward by Environment and Climate Change Canada.

This Summary Record of the CCICED's first meeting of Phase VI was prepared by Ms. Niki Hope for SISO, based on detailed notes recorded during the annual general meeting (AGM). Representing SISO's interpretation of the general debate and discussions, the Summary Record does not necessarily reflect the views of all participants. To encourage frank and direct dialogue, the Summary Record presents an overview of the points made during the discussion, without attribution to individual speakers.

II. Annual General Meeting

1. Environment and Development Open Forums

a. Forum 1: Green Urbanization and Environmental Quality Improvement

The forum was co-chaired by **Liu Shijin**, CCICED Chinese Chief Advisor, as well as vice chairperson for the China Development Research Foundation and the China Center for International Economic Exchanges, and council member **Lidewijde Ongerling**, secretary-general for the Ministry of Infrastructure and Environment, Netherlands. **Liu Shijin** introduced the forum topic and made the following remarks:

In the last three years, urbanization in China has accelerated, with many city clusters developing at a surprising speed. Research shows that development in China will continue, which will lead to more urbanization. At the same time, the government is concerned about how to promote urbanization appropriately. Traditionally, urbanization meant pollution, but now the focus is on green urbanization.

Experts from both China and abroad will help China determine a new pathway to avoid past mistakes, which will benefit not only this country but the world.

The chairperson introduced keynote speaker **Achim Steiner**, CCICED vice chairperson and United Nations Development Programme administrator. He offered the following remarks:

Urban development appears to be very schizophrenic. On one hand, urbanization is a success story. Half of humanity today live in cities, which are attractive in terms of jobs, the lights, the metropolitan effect, the pressure of the rural economy and loss of livelihood. But on the other hand, cities are also a failure in terms of the actual rationale and the effectiveness with which they are designed, or how have grown. They are often a failure in terms of mobility. They are usually places of immense pollution.

We know that air quality kills 4.5-million people worldwide every year. Part of that has to do with biomass and not having access to proper hygiene, but a significant part of it is the pollution we emit in cities.

Cities in the 21st Century find themselves struggling with the unintended consequences of urbanization. The first challenge is to tackle what is happening inside the city from multiple perspectives. It's not only about efficient buildings, green spaces, lack of pollution, but also the recognition that a city is not an island. It is part of a whole chain, regarding the movement of goods, clean water, food and other commodities.

The chairperson introduced keynote speaker **Qiu Baoxing**, CCICED member, counsellor of the State Council, and former vice minister of Housing and Urban-Rural Development. He offered the following remarks:

For the past three decades, urbanization in China was driven by industry. Urbanization has led to pollution, and, as a result, we need to move to green urbanization. We need to transform to a people-centric civilization.

Another problem in China is housing; people invest heavily in the property market. Many developments are built with steel and concrete instead of wood. Every year China consumes 60 percent of the world's cement and 40 percent of the world's steel.

Water pollution is structural, just as the energy shortage is structural. China uses a lot of coal and sometimes suffers from a shortage of natural gas. There could be a shortage of water in urban areas in the future because of pollution, which may become a problem. Air and soil pollution are also concerns in large metropolitan areas.

Small towns have seen their residents move to bigger cities. Life in cities may be good, but we need to improve the living conditions in small towns. Traffic in urban areas is a significant source of air pollution. The way roads are designed also contributes to congestion and further pollution.

The last challenge is floods and other disasters in urban areas. Globally, 80 percent of major cities typically suffer from one type of disaster, but in China, cities are affected by two to three types of disasters. With this in mind, the infrastructure in Chinese cities must be resilient.

Council member **Åsa Romson**, the former Swedish Minister for Climate and the Environment, shared these comments:

How can authorities intervene in areas that do not have set borders? We know cities are growing, so where is the green belt around them? We need to see cities as ecosystems and not just hubs for consumption.

Looking at cities as an ecosystem provides an opportunity because China, like other countries, will continue to see urbanization.

Council member **Zhou Wei**, chief engineer from the Ministry of Transport, offered his remarks on transportation:

On one hand, China is enjoying the economic benefits of development, but at the same time China faces transportation problems. Traditionally, authorities have planned cities first, and then considered transportation.

In most cases, priority is given to motorized transportation rather than city residents. This problem must be tackled at the root. Transportation must be given priority in urban planning. The Ministry of Transport recently issued a document that focuses on the development of transportation systems. It emphasizes the importance of new energy vehicles in reducing the negative impact of transportation on the environment.

It is also important to have the right indicators and the right incentives. The government should play the role of a supervisor so that transportation develops in a greener way.

Mark Tercek, CCICED member and president and CEO of the Nature Conservancy, made the following points:

Sometimes, people are surprised to hear from me on the value of cities because my organization is famous for protecting nature. But a few years ago, we began a cities program to emphasize their natural beauty, and it is our fastest-growing program to date. There are three reasons for this: firstly, cities need nature to thrive, be economically successful and be attractive places for people to live. Nature is an essential component of a city.

Secondly, nature needs cities. In particular, nature needs the people that live in cities. Today half of the world lives in cities; soon it will be three-quarters of the world's population. We need to indicate to people that nature is an important part of their lifestyle. The reason our new program is thriving is that investing in nature in cities is a solid economic deal. If we think about it as an investment opportunity, it is an investment that yields very high returns.

Thirdly, it turns out in many cases green infrastructure costs less, performs better and provides free environmental co-benefits. In China, there is a lot of work underway, including sponge cities, which we support, along with education programs. When we take a long view, we need people, especially young people, on our side.

Ajay Mathur, CCICED member and director general of the Energy & Resources Institute of the Republic of India, shared his remarks on how growth becomes 'black':

Buildings and transport often follow an urban plan that looks good on paper but doesn't necessarily work for residents. If I have to walk a long way to get to my work or public transportation, I obviously move to personal transport. And as my driving increases so do the roads to transport drivers. It's something we have seen again and again in every city around the world.

The government should acquire and make land available on the market and plan around people efficiently – from day one. There needs to be a focus on the coordination of areas around cities. It's not just urban pollution, but regional pollution is also a concern. Financing is an important part of making solutions happen and builds on a larger issue of the monitoring and sharing of data.

General debate and comments

When we talk about sustainability, it is important to not just focus on environmental sustainability, but also social sustainability. When we look at green urbanization, it should not be at the expense of poorer communities in urban areas. We need to have urban planning that meets the needs of those communities.

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Connectedness between the various levels of government is an issue that matters. Cities have certain kinds of authorities. For example, building codes are set at the city level. But other matters are set perhaps at the state or national level.

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Lidewijde Ongerling called the meeting back to order and introduced the next speaker, **Hao Jiming**, Council member and professor of the Department of Environmental Engineering, Tsinghua University and member of the Chinese Academy of Engineering. He made the following remarks:

The cap on coal consumption in China before 2013 doubled in five years. We find that national coal consumption reduced from 4.2-billion tons to 3.8-billion tons in 2016, so in addition to this, the Chinese government has nationwide emission abatement projects.

China has shifted from coal to clean energy in residential heating. The key point is that coal should be replaced by natural gas. At present, many households are expected to shift to natural gas, and there is now a 10,000-sq.-kilometre area free from coal.

In 2013, China initiated a regional air-pollution control mechanism. Periodic meetings are held to increase coordination between eight different ministries in China, as well as coordination between various levels of government. Systems have been set up to address responsibility and accountability based on China's administrative system. Resources have been mobilized at the national level to tackle the problem.

The government also introduced regional and seasonal restructuring, as heavy pollution periods occur mostly in autumn and winter. During winter, we have adopted the seasonal industry plans – which aim at pollution control for heavily polluting industries. A technical system for air-pollution response has been established, including forecasting, decision making, and the emergency response to control pollution and protect public health.

Economic policies are another way to control pollution measures. Nearly \$6 million RMB was allocated from the central government, with provinces, cities and county governments providing matching funds.

The government has imposed taxes and fees during elevated periods of pollution. In the last two years, joint research efforts have identified pollution and its origins. Hence China has adopted evidence-based decision making, with more accurate policies to control pollution. As a result of these measures, pollution has decreased by 20 percent between 2013 and 2016. However, there have been variations in different regions and different seasons.

The chairperson introduced **Stefan Schurig**, global leader on Regenerative Cities, World Future Council, who spoke on the concept of a 'regenerative' city:

We should consider the city a living system, which implies that we have to make the principle of constant regeneration of resources and urban space the fundamental guideline for the future of cities.

For this reason, the Council has come up with the term of a regenerative city, rather than a sustainable city. We don't want to sustain the city that has serious problems. A regenerative city looks at a city as a system – you put resources in, and you generate waste. So, the metabolism of a city should not be a linear metabolism, but a circular metabolism, where the resources the city absorbs are regenerated and where public space is designed for people.

Cities naturally develop near water, mainly due to transport and early trade routes. But a river is a city's air-conditioning system. This used to be an asset for a city, to have water and to store water. We have decreased urban wetlands in cities and have decreased the capacity for flood protection. We are addressing the subject of eco-system services within cities. Often, we forget that healthy soil in cities is basically a carbon storage system.

The key point we want to make is to have policies related to the conservation and protection of urban wetlands. We need to increase cross-departmental and cross-sector collaboration in addressing the issue of wetlands. My recommendations include wetland protection, integrated city planning and restoring urban wetlands in an ecosystem approach.

Qi Ye, professor at the School of Public Policy and Management at Tsinghua University, offered his remarks:

China has shifted from a rural society to an urban society. More than half of the population live in cities, which indicates they provide a decent life for people. However, pollution impacts the quality of life in cities. In 2011, people began to talk about smog – now it is rampant. For the new urbanization, we must talk about compact, green, low-carbon and inclusive growth.

In China, we changed the heating rules from coal to gas, but we are leaving many people without access to natural gas. Therefore, they are freezing in winter because they can't use coal. With this in mind, China needs to improve decision making under the rule of law with consensus, improved transparency and communication.

Council member **Johan Kuylenstierna**, policy director at the Stockholm Environment Institute, shared his observations:

The reduction of air pollution in Beijing is impressive. It is effective to build the capacity of government institutions to undertake quantitative analysis themselves. If we can quantify the benefits to human health from taking action on air pollution it shifts the action from a mandate for the Transportation Ministry to being an issue for the Health Ministry.

Europe is considering different measures, such as comparing active transport with other modes of transportation. Active transport, such as cycling, means you have a healthier population and this, in turn, can lead to reduced costs for health services.

We heard a lot about the success of reducing sulfur oxides and noxious oxides, but there are other particles which are becoming important. Ammonia is part of the PM2.5 problem and is under-researched. Black carbon is another important pollutant, and sources indicate that it has a greater environmental impact than other PM2.5s. Black carbon is also a warming element in the air.

As we reduce the emissions within a city, a larger portion of the pollution is going to come in from surrounding areas, so it is good to support regional cooperation.

Lei Guangchun, vice chairperson of China Wetland Science Committee, member of Society of Wetland Scientists and president of the School of Protected Area Studies at the Beijing Forestry University, spoke next. Here are the main points he shared:

Many people know there are great ecosystem services in wetlands, but wetlands are on the decline, particularly in urban areas. In China, there are many laws to protect forests and farmland, but wetlands are not protected by law, which is why wetlands are decreasing, particularly in Eastern China where urbanization is increasing.

China has had disastrous floods. Our urban planning has not integrated our ecosystem, and we have not done enough to restore wetlands. A law is urgently required, and the CCICED has an opportunity to propose this.

In 2006, when we started our wetlands park, it raised awareness about the value of wetland conservation. Now, 23 cities worldwide have been nominated to be wetland cities. China has nominated six such cities.

General debate and comments

Wetland protection deserves much more attention. An expert who did satellite studies of all wetlands in China concluded that since they are designated as wetlands, they have been encroached upon even faster than before. The good news is we can rely on satellite studies for this kind of work, and legal action can be taken.

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I'd like to endorse the view expressed by one of our speakers today on the importance of really understanding the underlying chemistry that is responsible for air quality. PM2.5 particles are only part of the story. The question is, what generates them? Many of the most serious problems we face are due to secondary chemistry happening in the ozone, which we don't understand very well. The air-quality issues in some of our major cities are different from one another, and we need to understand those differences.

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Do we have standards to determine green cities, such as criteria for environmentally-friendly infrastructure, air quality, clean water and safe soils? It is important to set up indicators to determine what a green city is.

b. Forum 2: Global Ocean Governance and Eco-Civilization

Co-chaired by **Su Jilan**, CCICED Phase V member, academician of the Chinese Academy of Sciences, Honorary president of the Second Institute of Oceanography, State Oceanic Administration; council member **Jan-Gunnar Winther**, director at Norwegian Polar Institute; and **Tian Wei**, moderator on the International Channel of China Central Television.

Lisa Svensson gave the opening speech on behalf of **Erik Solheim**, CCICED vice chairperson and executive director of the United Nations Environment Programme, who was to join the meeting later. Here are the main points she shared:

There is a link between ocean health and human wealth. The ocean is 70 percent of the earth and generates 60 percent of its oxygen. The ocean is the largest carbon sink, absorbing 25 percent of the greenhouse gases, while 3.5-billion people depend on oceans as their source of food. Eighty percent of all our goods use the blue highway. Still, more is known about the surface of the moon than the ocean, and the ocean is treated like a trash dump.

Estimates show that in 10 years, there will be more plastic in the ocean than fish. Plastic production increases 3-4 percent every year, largely ending up in our oceans and destroying its ecosystems. Demand for food security and the growing middle class are putting more pressure on resources. Production and consumption must change, and industry must consider environmental costs.

The ocean is the seventh largest economy, and there is tremendous potential for growth if done sustainably. The world needs to harvest within the limits of nature. Simply put, if you want eggs, you don't kill the hen. The good news is that China has a tremendous opportunity to be a leader in blue sustainability.

Peter Thomson, President of the 71st session of the United Nations General Assembly, sent his comments via video satellite link:

Thanks to greenhouse gases, the atmosphere is warming and, with it, the ocean. This is killing off coral reefs, driving species from overheated tropical waters, causing ocean acidification and

rising sea levels. Meanwhile, ocean pollution is reaching unconscionable levels. It's not just what is seen, but what science is showing us in the basic foundation of the ocean, caused by a wash of synthetics and cosmetics. At the same time, fish stocks are under huge pressure from over-fishing.

The good news is that there is a plan to bring respect and balance back to humanity's relationships with the ocean. I refer to SDG 14 and its purpose of conserving and sustainably utilizing ocean resources. It's a balance between protection and production that we must nurture.

I applaud the process set in place by CCICED for the foresight and leadership it provides in support of the implementation of SDG 14, to make sure that ecological services in the ocean remain intact for future generations.

Knowing that every second breath we take comes from ocean-produced oxygen should be sufficient motivation for us to prioritize ocean literacy. And it goes without saying that China is a key participant in ocean action. It is a large ocean state with a long coastline, and with the launching of BRI, China has made a massive commitment to the international ocean scene.

In this regard, it is heartening to see the importance China places on the United Nations' SDGs, which is particularly encouraging when it comes to the support of SDG 14, for it sets a clear course.

Vidar Helgesen, CCICED vice chairperson and Minister of Climate and Environment, Norway, offered the following remarks:

Oceans have always been important connectors. The vastness of the ocean and its many sectors is what makes it a challenge to address and to govern. It's easy to agree that there are issues, that we have resources we can tap into, that we need to protect to produce, but to do that, requires better governance.

Norway learned the hard way from over-fishing that it needed better management. Our solution was to create an integrated-management approach that involves all stakeholders to conceive plans for making use of the oceans in a sustainable way. A similar approach should be taken at the global level.

Council member **Finn Pratt**, secretary of Australia's Department of the Environment and Energy, spoke on ocean governance from an environmental management perspective:

Three of the world's largest oceans surround Australia. Marine governance issues feature strongly in Australia's priorities. There is an acute awareness that the health of the ocean underpins economic growth and sustainable development, both domestically and across our region.

The seas around Australia impact the work of almost every government portfolio and all aspects of Australian life, given the strong connection our people have to the coast and the sea that goes back many thousands of years.

Australia works to ensure its blue carbon ecosystems are healthy, as they are significant carbon sinks. Offshore petroleum and gas development is an important industry for Australia, providing revenue and ensuring the country has a secure energy supply. Australia enables the development of these resources in a way that boosts productivity while limiting environmental impact.

Tourism is another important area where the country seeks to balance economic, social and environmental outcomes. One approach is the creation of marine protected areas. Marine parks cover about a third of Australia's waters. The Australian government has proclaimed 60 marine parks, which protect ecosystems ranging from coral reefs to deep ocean trenches. The Great Barrier Reef, which is longer than Italy, is managed by different zones. A national park protects more than 33 percent of the Great Barrier Reef, and that's up from 5 percent fifteen years ago.

In 2015, the Reef 2030 plan was established to improve the health and resilience of the reef; it sets out a shared plan for various stakeholders. The threats to the reef are many and varied, and each requires its own approach.

Council member **Francesco La Camera**, director general for Sustainable Development, Environmental Damage, European Union and International Affairs with Italy's Ministry for the Environment, Land and Sea, made the following comments:

The G20 plan of action is now implemented. The work focuses on smaller islands and Africa, which are the most impacted by climate change. The question is why are we having issues with oceans? The essence of economic systems, how we produce and consume, are at the core. Overall, there is still a lack of understanding of the planet's limits.

Huo Chuanlin, deputy director general, Ecological Environment Protection Department, State Oceanic Administration, made the following remarks:

The State Oceanic Administration has been working on several issues related to ocean management, with a focus on the ocean economy, eco-civilization and global partnerships on oceanic governance.

Oceanic ecological civilization is a component of overall ecological civilization, sharing a similar understanding of how to respect the oceans and nature. The methodology should be holistic oceans management, with the eventual goal of realizing 'beautiful oceans' as part of constructing China's long-term vision.

Regarding global ocean governance, China will actively participate in relevant international cooperation and build a blue cooperation partnership with other countries and regions. China

will also launch major initiatives dealing with issues such as monitoring micro-plastic pollution.

A representative from the Bureau of Fisheries, Ministry of Agriculture, made the following points:

China is a big country with a large population and a sizeable fisheries industry. It needs to provide fish not only to its population but also export to other countries. To meet the demand, China has developed a vast aquaculture industry. By 2020, China will control the problem of over-fishing by reducing the number and horse-power of fishing vessels, reducing the quantity of fish catch, and by extending temporary fishing bans.

To protect marine biological resources, the ministry has implemented measures such as extensive release of fish fry, development of 'ocean ranches' and establishing marine species protection zones, especially for endangered species.

China also actively participates in international cooperation on global ocean governance, joining international agreements and conventions, implementing zero tolerance for violations, and the introduction of its experience to other countries through the BRI.

A spokesman for the Department of Water Environment Management, Ministry of Environmental Protection, shared these remarks:

The MEP developed measures in ocean environmental protection, including strengthening land-based pollution control in coastal industrial management, prevention of land-based pollution, management of marine pollution, ocean ecological protection and risk prevention, and by participating in national macro-policy making.

MEP also actively participates in global ocean governance by working closely with international organizations like UNEP, sharing lessons and best practices.

General debate and comments

We've learned from the Paris Agreement that setting a target has a strong mobilizing effect. It would be ideal if we could do something similar with oceans – with different goals because there are different challenges. Setting targets as a rallying cry for action is effective. For example, one target we could aim for is zero plastic in the ocean.

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From the climate process, the global community can learn the importance of international collaboration and cooperation, and the use of data and evidence. We need to move much faster to save our oceans. We need to be able to paint a picture of the issues we face in more effective ways than we have with climate change.

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Tian Wei chaired the next session on global ocean governance, introducing council member **Diane Regas**, executive director of the Environmental Defense Fund:

EDF focuses on the most pressing issue with the biggest opportunity, which is addressing over-fishing. We share practical experience from around the world and help develop new technologies to share. Our recent analysis suggests we can increase fish supplies by 29 percent, which increases profits overall, meaning it's possible to achieve positive environmental results while generating revenue.

Andrew Steer, president of the World Resources Institute, made the following comments:

We are a group of about 750 experts in about 50 countries, and we focus on economics and human behaviour. We believe it is important to consider why people act as they do and to understand the incentives. We need to convey that it is possible to both grow your economy and address climate in regard to oceans.

General debate and comments

The Paris Agreement is interesting because it has voluntary aspects but also has elements that must be implemented. They said you must be transparent, you must have a plan, you must be willing to discuss that plan, and you must be willing to come back and be more ambitious every five years. We should strive for this type of plan in ocean protection.

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Representatives from NGOs engage in areas such as promoting marine protection zones, making NGOs' voices heard in ocean protection, enlarging NGO numbers and involvement in fisheries, sustainable development and blue upgrades driven by data, tech and information exchange. NGOs may play a role as information facilitators among government, business and the public, but few of them are involved in marine protection at present. They need to grow in that area to draw more people in.

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The amazing thing about addressing over-fishing is that when we are successful, fishermen can catch more and there can be more resources for communities. It's not a zero-sum game. Sometimes the term 'balance' implies that we can do without fishing to protect the ocean. I reject that.

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Tian Wei chaired the next panel discussion between council member **Jan-Gunnar Winther**, director at Norwegian Polar Institute, **Su Jilan**, CCICED Phase V member; academician of the Chinese Academy of Sciences, honorary president of Second Institute Oceanography, State Oceanic Administration, and **Andrew Steer**, who made these remarks:

When China speaks, people listen, and people copy. It's not in China's interest to have plastics in greater volume than fish. It's not in China's interest to have its fish stocks collapse. That is why it is so encouraging to hear there is so much action with climate.

When China said we are going to take this seriously together with former President Barack Obama and Europe, it was an unstoppable tipping point. The very week that President Donald Trump announced he was pulling out of the Paris Agreement, President Xi Jinping and the Chinese authorities announced another \$350 billion for renewable energy. We need that kind of leadership now, and it's very encouraging to hear what has been said today. There is a win-win here because it makes no sense to drive the world's fisheries into oblivion.

Jan-Gunnar Winther made the following remarks:

Regarding global governance, stewarding our oceans and our ability to produce food, the world will be in a much stronger place as China decides to engage much more fully on ocean and fisheries sustainability. Today we heard exciting updates from China – such as decreasing the number of fishing boats to reduce over-capacity and reducing the total catch in Chinese waters to sustainable levels. China is closing down harmful, unsustainable aquaculture facilities and increasing the number of protected areas. China can achieve the same increase in fish stocks seen in other countries if it applies the same principle of sustainability.

General debate and comments

The private sector has the innovation power as well as the investment and capital capabilities to create change in terms of supply chains. There are many private sector agencies that want to be part of the solution related to ocean protection. At the same time, governments are sometimes fragmented and there can be division regarding oceans, but there shouldn't be.

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Erik Solheim closed the meeting with these key points:

There is a need for global, rules-based order, a focus on job creation and environmental protection. China needs to be a global leader on this. The single issue with the biggest momentum is ocean litter and plastics. Just in the last year, this issue has skyrocketed in the global arena, and we see forces for change coming together with citizens demanding action.

In practical terms, what needs to be done on plastics? There are some plastic materials we do not even need. For example, plastic straws – the average North American uses 600 a year. Why can't they simply drink from the cup? Some plastic materials are necessary, such as those used to make food last longer, or for cleaning purposes, but biodegradable materials can replace many of those items. By replacing, re-using and avoiding plastics, some of the issues related to oceans can be solved.

c. Forum 3: Yangtze River Protection and Innovative River Basin Governance

Stephen P. Groff, CCICED member and vice president of Asian Development Bank, and **Wang Jinnan**, president of Chinese Academy for Environmental Planning (MEP) and academician of Chinese Academy of Engineering, co-chaired this open forum.

Co-chair **Stephen Groff** opened the discussion with these remarks:

Our work with the ADB is quite extensive along the economic belt, totaling about \$2 billion in assistance from 2015 to 2020. The Yangtze River is one of longest rivers in the world and provides water to 584 million people living along its banks. The river has seen extensive development and contributes heavily to economic growth, but this has come at an extreme environmental cost, including a loss to biodiversity, reduced river quality and an impact on residents' health.

The Yangtze River Belt master plan sets out objectives and measures to address the challenges. Today's forum can help identify areas to improve and where to focus future work.

Keynote speaker **Wang Yi**, vice president of the Institutes of Science and Development (ISD) of the Chinese Academy of Sciences (CAS) and a member of Standing Committee of the 12th National People's Congress of China, made the following remarks:

China is determining how to use market incentives, better governance and administrative arrangements to improve the environment. Since 2014, the central government has issued integrated reform plans to support environmental strategies, which sends a strong signal.

For the 19th CPC Congress, the focus is on quality of development and the establishment of more economic systems with green, low-carbon approaches and circular economies. The goal is to change development models and optimize economic structure.

China wants to speed up its environmental efforts to ensure it meets 2035 targets. Globally, China will continue to help guide and support environmental governance systems. The priority for the future should be legislation in the context of ecological civilization. China should revise important laws and create new ones.

Also, the goal is to develop the Yangtze River Law and increase enforcement of the law, which is now under discussion. The second point is to make administrative reform, which will take shape once government restructuring is announced in March.

From 2003 to 2004, CCICED had an integrated River Basin Management working group and almost all recommendations from the group were put into action. The recent challenge is that we have a new approach, eco-civilization reform and action plans for environment protection.

Due to the river's length, it's important to consider laws and regulations that apply to conservation along its whole length. China should have an inter-governmental or regional decision-making body to establish a modern river-basin management system. China should

use market-based instruments and change water policies, fees and laws to encourage market-based reform.

Any recommendations should help to realize conservation first and then green development along the river's lower, middle and upper reaches. China should reshape the relationship between the rivers and lakes, as well as the dam systems in the upper reaches. There must be a push for the evaluation of clean engineering for infrastructure projects, spatial planning at the river-basin level, and reallocation of development and conservation areas.

China will push a green and smart Yangtze River action plan and pilot these approaches in key areas. Lastly, we need sustainable livelihoods and compensation for the people living in the middle and upper reaches of the river.

Keynote speaker and council member **Marco Lambertini**, director general of the World Wild Fund for Nature, made these comments:

We know how important the Yangtze River is for China, and globally as well. Rivers are an important natural resource that have been taken for granted for too long. They look so mighty, invincible and infinite, but we understand they are fragile ecosystems and need care.

Globally speaking, the threats to rivers are well known and include the overuse of water, pollution, climate change and extreme weather. WWF is developing what we call the 'Living Planet Index,' which measures biodiversity and nature as an indicator of the health of ecosystems.

The message of the Living Planet Index is that in the last 40 years, less than one generation, we have lost almost 60 percent of the wildlife population of the planet. These stats convey the unsustainable way we manage resources.

And it is worse in water. Wildlife in the ocean has declined nearly 40 percent and freshwater wildlife has declined almost 80 percent. Rivers, lakes, coastal swamps are under more pressure than any other wild ecosystem. Nevertheless, the response and thinking on achieving sustainability is changing.

That is why on the one hand there are concerns about the threat but on the other hand excitement about the response. China is showing a progressive way of thinking in terms of relating to the natural environment.

Co-chair **Wang Jinnan** made the following points:

The Yangtze River is critical to China, both economically and ecologically, which is why President Xi Jinping called for strong protection of the river. However, upstream, midstream and downstream levels of management differ tremendously. The area is a key fresh water source for the country. At the same time, the economic zone is facing severe challenges, severe soil and water loss, exploitation, urbanization and loss of arable land. The natural habitat for flora and fauna has reduced by 3 percent.

Pollution and emissions have increased because more than 40 percent of China's population lives along the river, and it is home to many heavy industries. If we look at specific problems, 12 regions along the river do not meet the water-quality requirement; 18 percent of the ground water and 67 percent of underground water is unclean.

There is an increasingly acute imbalance between the demand for development and the need to conserve. There are many poverty-stricken communities along the river, and many areas suffer from over-development of the hydro dams. These projects cause heavy pollution and affect the river.

Urbanization and industry also lead to pollution along the river. There are over 800 heavily polluted rivers and water bodies, especially around the Yangtze economic zone, making up 43 percent of the nation's heavily polluted rivers. There is a lot of pressure imposed by industrial development along the river, in upstream tributaries such as the Jinsha River.

Pollution treatment methods were developed to treat and prevent pollution caused by heavy industry along the river. We have encouraged an overall protection framework to control environmental risks and promote cross-regional cooperation.

Hu Baolin, CCICED special advisor and deputy director and executive officer of the Three Gorges Project Construction Committee of the State Council, spoke next. Here are the main points he made:

The Three Gorges Reservoir Region is of key national importance. The reservoir is critical to preserving the ecosystem in the upper reaches. We have been following a priority strategy to promote green development and protect the river and prohibit major projects there. In total, \$56-billion RMB has been allocated to implement the strategy.

The region is seeing an improvement of the ecosystem and people's livelihood. In recent years, there have been three areas of focus for protection:

- * The continuous improvement of wastewater treatment facilities. The maintenance of the water levels for the 163 counties around the reservoir – most of which have water treatment plants.
- * Reforestation of the slopes around the reservoir and increasing environmental supervision every year, along with improving control of agricultural pollution.
- * There are programs to assist people affected in the reservoir area and assistance for enterprises that increase ecological agriculture. Additional efforts to support local populations and industries to develop eco-agriculture and tourism.

Many counties in the region are below the poverty line and have been subjected to eco-pressure for years. The focus for local governments is to build an ecological civilization to restore the Yangtze River ecosystem while developing local economies to reduce poverty. Living standards in the region should be based on a low-carbon model. Pollution entering the

reservoir must be reduced, and there must be more wastewater treatment around the reservoir. Local governments need to be incentivized to clean up the water.

There should be integrated-pollution treatment along the reservoir and the river. An eco-corridor needs to be established along the river, with forest coverage reaching 50 percent; wetlands should be better preserved, and plants should be protected. There should also be targets for fauna and flora protection.

Local governments must be responsible for the protection of water in their regions; however, some local officials are now part of the problem. These areas need targeted support and further study to help protect and enhance the water.

Ben Bingham, country director for China, Asian Development Bank (ADB), made these remarks:

The Yangtze River Economic Belt master plan calls for the building of a green ecological corridor that prioritizes ecological and environmental protection along the river. The master plan seeks more economic growth, enhanced food security, sustainable delivery of services, and increased economic and environmental resilience.

ADB is focused on two issues: first, the requirement for enhanced cooperation and coordination among provinces to achieve integrated planning and management strategies along the river; secondly, the necessary institutional capacity needed to implement the management approaches.

ADB has a long history of support for the Yangtze River economic belt. Over the past 15 years, we have invested more than \$10 billion in various sectors associated with this economic belt. While many of these projects were successful, they have been typically a response to the need of individual provinces and municipalities. There has been insufficient attention to coordinating projects across sectors and maximizing synergies with multiple provinces, sectors and co-benefits to the interventions.

The current strategy pursues a more integrated approach. To this end, we are supporting several broad streams of work: ecosystem restoration, environmental protection, management of water resources, integrated multi-modal transport management, institutional strengthening, capacity building, policy reform and eco-compensation. This initiative will require the involvement of multiple stakeholders. The goal is to be a catalyst by working together to develop innovative models.

In total, ADB will provide \$2 billion for the middle and upper reaches of the river. The aim is to foster inter-provincial and agency synergies. Our forthcoming project, called the Yangtze River Comprehensive Agricultural Development Project, will include one watershed in each of five provinces and one municipality. It will focus on using a river-basin approach to watershed restoration.

The project aims to tackle issues such as soil erosion, agricultural waste management, water resources management, low-agricultural productivity and strengthening farmer organizations. It is a comprehensive approach that seeks to build cooperation structures and support through institution building.

Seeking to develop coordinated structures across agencies and provinces will require significant capacity building efforts. Without that, it is hard to see this complex structure coming together. The innovation ADB seeks boils down to how to build on existing pillars of the past years; how to develop collaborative structures to allow synergies of initiatives to be realized; and how to support that with capacity building.

Part of the solution is catchment management, controlling erosion, supporting biodiversity and creating jobs. Some of this is being achieved by planting more bamboo, which improves livelihoods. In China, 8 million people work in the bamboo industry, which injects billions of dollars into the economy. The provinces we are talking about are recognized bamboo provinces, and we believe bamboo should play a critical role in the management of the Yangtze River basin.

General debate and comments

First of all, what is needed is the political will, and the 19th CPC Congress gave a great boost to the development of this project. In Russia, we set up the federal water resources agency, an inter-regional body to deal with river basins and help monitor and implement government policy. We support a programmatic approach, with regional finances and private sector investment attached, which helps build the financial structure.

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There are some major priorities for Yangtze River management. Firstly, legislation needs to be stronger. It is key to create a Yangtze River law that is integrated. We need to reform the river basin and regional-water management mechanisms and institutions. Secondly, more cooperation between national and regional governments, including integrating water, land, cities and rural areas, is required. Lastly, an integrated river basin platform for information, auditing natural resources and data, needs to be set up.

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Chair **Wang Jinnan**, president of Chinese Academy for Environmental Planning, MEP and Academician of Chinese Academy of Engineering, reconvened the meeting and introduced council member **Scott Vaughan**, president and CEO of the International Institute for Sustainable Development. Here's a summary of his comments:

I want to underscore how important it is to avoid pollution. For example, in the Great Lakes region in Canada and the U.S., where they are looking at the legacy issues of heavy metals, invasive species, aquatic stress and nutrient levels, the estimated cleanup cost is now more

than \$40-billion U.S. per year, which underscores the point that we need an ecosystem approach up front to avoid costly cleanups at the end.

Yu Hongxia, deputy director-general of the Environmental Protection Bureau of Jiangsu Province, made the following points:

Jiangsu is in the centre of the southeast region of China. It has extensive water networks in the Yangtze River basin, with over 2,900 rivers, 290 lakes and a long coastline. The water accounts for 17 percent of the area; therefore, the quality of water bodies links to the livelihoods of the residents.

In Jiangsu, 80 percent of freshwater demand draws from the Yangtze River, and it is home to dozens of industrial and chemical zones. The amount of industrial waste water annually amounts to 2-billion tons; therefore, we need more systematic measures to protect and improve the river basin. Since 2004, we formulated Yangtze River protection control regulations, and four years later we revised it to set requirements higher than national standards.

Enterprises that emit more will have to shoulder more responsibility. We adopted an eco-compensation transfer payment policy in the provincial budget, setting aside \$1.5-billion RMB a year to compensate and reward equal function area protection. We optimized the structure by promoting a redline protection zone and adopted a two-level control structure. We are now in another round of corrective measures against chemical enterprises. As a result, the number of chemical enterprises within the provinces has been cut significantly.

We have an action plan to focus on coal and chemical reduction to improve the environment in specific areas. Additionally, we are focused on improving drinking water, administration and planning.

The chair introduced **Zhang Huaying**, vice president of Coca-Cola China and Korea, who made the following remarks on the company's participation in river basin management:

Since 2007, Coca-Cola has worked with WWF on Yangtze River protection and water management. There are between 500 and 600 enterprises along the river, and, if everyone contributes the water can be protected.

Working with the WWF, we find three approaches that are useful. Number one, we should protect water sources and wetlands. Secondly, from the perspective of a value chain, we need to protect and use resources better. Lastly, we have to be better aware of natural capital because nature does not simply exist; it has a value. We need to look at wetlands, which are essential to our planet. If we don't protect them, there will be no more fresh water, and we will have no one to blame but ourselves.

She concluded her remarks by showing a short video showing how Coca-Cola is doing work in this area.

Indu Bhushan, director general of East Asia Department, Asian Development Bank, made the following comments:

With significant pollution from industry, chemical factories in the Yangtze River basin, runoff from agriculture and discharge from shipping, the need for intervention is immense. Some of the figures we have show that 75 percent of wells and rivers are significantly polluted and 82 percent of people depend on them for water.

Meanwhile, 3.8 percent of GDP is lost because of pollution, and there is a massive impact on human capital because of health issues. The goals of the Yangtze River plan are very ambitious and will require trillions of Yuan every year. The government can only cover 15-20 percent, so outside funding is required.

Why is money not flowing in? The issue is about prices, capacity, market failure and risk. The price of water is low and does not reflect the value of water. This means there is little willingness to save water – leading to overuse – or to prevent pollution. Provinces have a high ability to borrow money and weak authority over water. Additionally, it's not clear how the eleven neighbouring provinces should coordinate on water issues.

For pollution, the problem is the 'tragedy of the commons,' because the people who pollute are not absorbing the costs of cleaning up. Therefore, there is no incentive for any organization or province to clean up, and the private sector has no incentive because of high-cost and high-risk.

But the good news is there are a lot of exciting opportunities. The government is using innovative financing mechanisms, including piloting five projects to establish green financing. Work was done on PPP and eco-compensation, along with institutional reform to provide financing, green lending, green insurance, green development funds and carbon finance. Additionally, the government is working on a tariff structure for wastewater.

The issue is to support institutional arrangements, so the money goes to green development. Water bonds are another tool. In 2007, we supported water bonds in various provinces to encourage green development in the area. Currently, work is being done on a green finance facility to harness corporate investment and establish an eco-compensation fund to which the polluter or beneficiary would contribute.

General debate and comments

It is striking to hear from Coca-Cola, ADB and WWF on the importance of protecting natural capital. One area China has shown leadership on is establishing an effective economic framework. China shows world leadership on different models that go beyond GDP, by saying income growth is important but also considers the natural and social capital. What would a beyond-GDP framework look like in Yangtze River?

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With urbanization, people lose touch with nature. Even people in villages take it for granted, as if it is supposed to be there. While the Chinese government is investing in environmental protection, that doesn't mean they know the best way to do so. But money in China goes further, making it fertile piloting ground for many of the solutions.

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We should talk more about forests, which play a unique and irreplaceable role in river basin protection and enhancement. In 1998, along the entire basin of the Yangtze River, the country suffered from severe flooding, which led to social, environmental and economic loss. One of the reasons for the flood was the degradation of forests, leading to landslides and erosion. After thousands of years of dealing with floods, we know only green mountains can control flooding. We need to focus on forest restoration and optimizing forest management.

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I support comments made on wetlands and forests in the role of protecting catchment areas and river basins. On wetlands, it is key to bring wetlands into urban centres to educate, help with recreation and expose children to the enriching experience of nature and wildlife. When we talk about forest restoration, there is an interesting dimension on invasive species. I want to highlight integration, coordination and the crucial role federal government regulation plays in facilitating and building on success stories and incentives to improve best practices and transform them into mainstream practices.

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Previously, there was a reliance on administrative measures in the field of environmental protection, now it is shifting to more legal measures. However, we have not yet deployed economic and market measures. How do we develop green financing in China and allow private capital to take part in green innovation? We need to have more incentives or support measures. As a result, green financing related to the environment has not improved.

d. Forum 4: Business Roundtable on Innovation and Green Development

Co-chaired by **Zhai Qi**, CCICED special advisor, executive secretary general of the China Business Council for Sustainable Development, and **Dominic Waughray**, CCICED special advisor and head of Public-Private Partnership, World Economic Forum.

Council secretary-general **Zhao Yingmin**, vice minister of China's Ministry of Environmental Protection, opened the forum with these remarks:

Green development is one of the five philosophies of development in China. Technology and innovation hold the key to addressing energy and resource constraints for green development. Businesses are the major source of innovation. More and more enterprises are exploring new business models, such as the sharing economy, internet and big data. They have fostered new sources of growth in low-carbon and green supply chains and injected clean momentum for economic growth, providing new solutions for environmental issues.

In China, more enterprises are improving environmental standards with enhanced economic returns. CCICED is ready to work with the business and industry communities and share outcomes and best practices, to drive green practice.

Catherine McKenna, CCICED international executive vice chairperson and Minister of Environment and Climate Change, Canada, delivered the following remarks:

We all know the environment and the economy go together, and so it is critically important that business be part of the conversation. Innovation is key to tackle the major problems, and there is no bigger problem than climate change.

What we have seen is that Chinese and international companies are instrumental in driving innovation and green development in China and globally. Business is often faster and nimbler than government in promoting the greening of industries through increased development and adoption of green technologies.

Governments have a role to play. Green enterprises need to build markets throughout the world with as few trade and investment barriers as possible. This week, Canada's trade mission to China included Canadian companies presenting solutions from Canada on clean energy, water, air and soil.

The role of government is to create the right conditions for innovation in green development. An example is the introduction of carbon pricing. China will be launching a national carbon market that will be the world's largest, and that's going to change the way businesses approach development. They will have the incentives to reduce emissions and innovate. Canada has introduced carbon pricing, a measure which provides the right incentives for businesses to move to a cleaner future.

China has made many strides in terms of green financing, advancing and firmly establishing green development, moving towards a low-carbon, as well as a circular economy. Governments and businesses need to work together and move in the same direction.

Council member **Marjorie Yang**, chairperson of Esquel Group Technological, Financial and Business Model Innovation, offered these comments:

I come from the textile and apparel industry, which can be more profitable by adopting sustainable strategies. Over the last ten years, we were able to reduce 40 percent of energy consumption and 60 percent in water. With the recent development in nanotechnology, there is hope for even more savings in water.

Félix Poza Pena, CCICED Member and Chief Sustainability Officer of Inditex Group, made the following remarks:

The keys to sustainable development in the fashion industry are the improvement of the management and design of facilities, the development of new technologies and encouraging

customers to use products more sustainably through informative labeling. It is also key for Inditex to promote the reuse and recycling of garments.

In the supply chain, the most important factor is water management. The production of improved water management in our supply chain will lead to cleaner, more efficient usage.

Yang Xiaoping, president of BP China, provided these comments:

The energy sector faces two challenges: the first is the expanding world population. In 20 years, the world will have a population of 8.8 billion, with 2 billion of them living in poverty. How to provide acceptable energy sources is a significant challenge – not every country has the capability to offer subsidies, and not all people can afford energy. Another enormous challenge is how to tackle climate change with clean energy sources for transportation.

BP's view is that innovation holds the key to address these two challenges. Whenever we improve 1 percent of GDP, it will cost about .07 percent energy. For every 1 percent of GDP, we only require .03 percent energy consumption, so more focus on energy efficiency is required.

Michelle Cotton, president and senior environmental scientist of Solstice Canada, made the following comments:

When we talk about the new era, what resonates with me is the emphasis on managerial and institutional innovation. We always emphasize technology, but what is implied here by including managerial and institutional innovation is that the process and approach must change for green development.

Technology is only part of the solution. Real change has to come in how we solve problems and who we let participate in the process. To move into the new era, the language, economic and environmental behaviours must change; the environment's impact on health and safety must be added to the list of considerations.

General debate and comments

Regarding development of new business models, China is quite aggressive and leads the world in e-commerce platforms and the sharing economy. In China, the role of the government is usually greater than in other countries, so government can lead the sound and sustainable development of a sector and has achieved much more when compared with other governments.

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It's not just about emission reductions, but also about offering low-carbon, relevant solutions and having a more optimal energy mix. Denmark has an overall energy efficiency of 72 percent, but in China, it is 36 percent. Government has an important role to play. China still faces a scarcity of natural gas and energy, and a holistic solution to the challenge is needed. The district energy solution, as championed by the UN, is one viable solution because Denmark can

decouple economic growth from energy demand growth, and Denmark is also moving to a carbon-neutral society.

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Thanks to a speaker for pointing out that in addition to production, our lifestyle and consumption choices have an impact. Indeed, in fashion, we see a good example of where scale and low-cost inputs lead to a disposable mentality.

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There are a lot of major changes in the textile industry. NANO technology is going to make major changes on the manufacturing side. Hopefully, it will also reduce the size of water treatment plants.

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Technology, even five years ago, didn't have the same promise, or ease of use, which is essential. Indeed, this is an era of technological breakthroughs, and the role of big data to properly utilize new technologies must be maximized. The key is to use the data, so you don't have overconsumption. For example, recycling and upcycling still take energy, but if you don't make what you don't need, you save energy.

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Along with consumers, we need to educate entrepreneurs. If the company only cares about the GDP contribution or economic return, this is not a responsible citizen or company. Companies have the responsibility to not only maintain the environment but to improve it.

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Dominic Waughray, called the meeting to order and made the following remarks:

If there is one thing we could take away from the earlier segment it is the need to do more than the incremental – a transformation is required. Innovative changes can be leveraged and harnessed into the green development space.

Bie Tao, director general, Department of Policies, Laws and Regulations, Ministry of Environmental Protection, made these main points on the collaboration between the public and private sectors in China:

Promoting green development and accelerating green transformation are basic solutions to resolve ecological issues. Green transformation requires changes to transportation and other traditional industries. It not only involves technology and innovation but also calls for tremendous capital and investment. However, private capital is also required.

Currently, the fiscal investment in environmental protection is about \$500-billion Yuan, and private capital and investment contribute about \$600-billion Yuan. Based on the current social and public investment, more must be invested to see results.

The rate of PPP in environmental protection has progressed rapidly. According to the Ministry of Finance's PPP centre, by September 2017, there were over 14,200 projects with investment into the trillions. The environmental PPP project number and percentage of investments reach about 10 percent and 20 percent respectively, which means environmental protection has been the main testing ground for the PPP model.

The PPP model not only presents the function of financing, but it's also about the transformation of project management. Promoting PPP could also open up the environmental market, creating ideal conditions for a variety of businesses. Required for success are scientific, reasonable and efficiency-based fee setting. Recycling of resources is also important to expand the channels of profit.

Galit Cohen, CCICED special advisor and deputy director general for Policy and Planning, Ministry of Environmental Protection, Israel, made the following remarks:

A key message coming out of the discussion is the business of pushing for environmental change, the need to update and entirely rethink our models for cooperating with different stakeholders around the table. China, thanks to its vision, commitment and size, could truly drive change.

The first platform is government-led and tracks the entire range of solutions, from science and technology programs, activities in academia to commercialization of technological solutions as well as diffusion of new business models and other services with potential environmental gains.

Many of these platforms have worked well in Israel's water sector and could be implemented in the broader range of environmental industries. There needs to be policy that helps reduce risk for companies when it comes to innovative solutions for environmental challenges.

We all know that industry can be very conservative, and for good reason. Companies must be supported by governments and not have to carry out unreasonable demands in terms of investment. While some may fail, the potential of others will overcompensate for those that do. For special solutions to environmental problems, offer a grace period in the implementation of new solutions, allowing for a more flexible regulatory environment to foster innovation.

Israel has had great success implementing innovation in the water sector by enabling cross-government collaboration with our Ministry of Defense. The top institutions in China, closely working with government, could identify gaps and provide better linking of science and tech programs to environmental programs. From our experience, there are gains to be made by synchronizing these sectors. Academia also should be included in the discussions.

Li Zhengu, president of Longi Silicon Materials Corporation, made the following points:

The environment has improved in Beijing over previous years because of the efforts by the Chinese government in reducing the use of fossil fuels. As a result, we see immediate improvement of air quality.

While China has banned the use of coal in this area, the question is: what are the alternatives? Clean energy is no longer unaffordable in many cases. Photovoltaics, in the not so distant future, will be the most affordable energy source. With the improvement of energy storage, we believe in the next seven years, low-cost PV and energy storage will make clean PV the main source of energy.

PV is the most abundant source of energy worldwide. Throughout the world, we have evenly distributed PV sources, so that means it will be the mainstream energy source in the future.

Stine Lise Hattestad Bratsberg, CEO of PURE Consulting, spoke on her experiences in Norway:

Eighty-seven percent of world business leaders believe the SDGs are an essential opportunity to rethink approaches to sustainable value creation. Eighty-four percent of business leaders call for greater collaboration with national governments and action plans.

Half of the world's largest companies are acknowledging climate change as a financial risk. The next challenge for business is to come through with meaningful contributions to the global efforts to achieve the SDGs. We need to quantify and effectively communicate what impact companies are having on the goals and green development overall.

The public sector must open up and offer opportunities to the private sector to earn money while solving environmental challenges. We need new thinking related to incentives that aren't just financial.

For example, Norway started a government and private sector organization to reduce food waste by 50 percent by 2030. Now, moving forward, it is the private sector that pushed the government to improve profits.

Peter G. Tsantrizos, president and CEO of Terragon, provided the following remarks:

The government has been like a parent who overindulges its children when it comes to waste management. Because people didn't care to manage the byproducts of their consumption, larger garbage trucks and sewers were developed, which has created bad behavior. Today, we throw more and more away.

Industry will naturally want to grow, and, if a throwaway society is encouraged, this will become a bigger problem. In Canada, for example, we throw away three kilograms of garbage every day, representing about 30 percent of the entire energy we use. Water is the same issue – with a one-pipe-in, one-pipe-out approach. Canada uses an enormous amount of water: 300 litres per day, per person.

The solution to this is something our parents knew – waste not, want not. Industry is learning this because industry has an economic incentive. Individuals are not learning it because our government hasn't allowed us to learn it.

Terragon has developed technologies that enable people to convert byproducts of their consumption into useful resources right at the site where the byproducts are being generated. Roughly 50 percent of the thermal energy used in a cold climate like Canada can come from the materials we throw away. Simply taking the water from our showers and laundry and cleaning it enough to use it for toilets is an economical solution.

Yang Xiaozhong, vice president of Trina Solar, spoke on the potential of renewable energy capacity:

Government has made headway in PV alone. In 2012, when there was a crisis in PV, two vice premiers visited Trina Solar and asked detailed questions. After the visits, relevant policies were put in place.

Companies like BP that are shifting from traditional energy to clean energy, inspire other companies. With this in mind, collaboration with government agencies and between old and new players is required.

General debate and comments

The consumption of PV still faces many barriers, such as gaining acceptance by utility companies and clients. Chinese consumers have greater readiness than in the US and the UK in using renewables, but the action of businesses and business leaders is necessary to facilitate their readiness and incentivize the public.

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I suggest the Chinese government study the establishment of a green development fund to strengthen governance and the introduction of private capital in PPP, to provide encouragement. Israel is the leader in the world for reusing water; agriculture uses 86 percent of our treated water. But it's not all about technology or pricing, it's also about a platform for innovation and policy to tackle water security.

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Soon PV will become the most competitive source of energy. I am more worried about the fact that people are overprotective of traditional energy sources. To ensure a cleaner world, we need to advocate against trade protectionism. PV models come cheaply, so we should not restrict its development.

Catherine McKenna made the following concluding remarks:

The idea of changing behaviour by putting a price on environmental liability and what we value and don't value is effective. There has been a lot of the emphasis on fostering cross-sectoral partnerships, which is key and why discussions like this are beneficial. It can't just be what can government do, what can business do, because otherwise, we are not going to solve the big problems we face.

The focus on achieving success on the sustainable development goals through better PPP on areas such as food waste is a practical piece. There are many pragmatic ideas for the Council to consider when the final recommendations are discussed.

Zhao Yingmin concluded with the following comments:

There is every reason to be optimistic about the future given that businesses are now showing tremendous innovation capacities under the backdrop of green development.

Green development has become part and parcel of many developing businesses, as going green is not just a burden anymore, it is an engine for growth. Innovation is not only related to technology, but in funding formulas as well.

The models of green development, in combination with the market, provide us with a new source of inspiration. At the same time, we need the engagement of the general public throughout the entire journey because consumption determines the supply.

On the other hand, several speakers said consumers sometimes only have what is supplied by business, so there is a need for greater coordination between the two sides.

2. Working Plenary Meeting

Li Ganjie, CCICED executive vice chairperson, called to order the first meeting of Phase VI. On behalf of the Chinese government, he welcomed all participants and delivered an overview of the Council. Mr. Li then introduced CCICED international executive vice chairperson and Canada's Minister of Environment and Climate Change, **Catherine McKenna**.

a. Remarks by Catherine McKenna, CCICED International Executive Vice Chairperson and Minister of Environment and Climate Change, Canada

Canada has been the Council's principal international supporter since it was created in 1992. The Council is at an exciting moment, as 2017 marks the beginning of Phase VI.

This new phase coincides with heightened interest and urgency for action on the environment across most of the world. President Xi Jinping at the 19th Party Congress emphasized the environment and ecological civilization. Earlier this week, Canada's Prime Minister Trudeau discussed with President Xi and Premier Li the need for action and leadership from China on the environment and climate change.

China has made a remarkable shift in its focus and is now demonstrating global leadership on climate and environmental issues. China is already thinking about its mid-century goals for building an ecological civilization. It is important that CCICED consider this long-term vision.

Internationally, there has been tremendous momentum these last few years: the Paris Agreement, the 2030 Sustainable Development Goals, the Kigali Amendment to the Montreal Protocol, where the magic global threshold was reached, which will mean saving half a degree in global warming.

At the recent ministerial meeting on climate action that Canada co-hosted with China and the European Union in Montreal, it was made clear that the Paris Agreement is irreversible and non-negotiable. More recently at COP23 in Bonn last month, Canada was among a group of 25 members that launched the Powering Past Coal Alliance, which is committed to phasing out coal power generation.

The work of the China Council is to provide recommendations to China's state council. Judging by President Xi's speech at the Party Congress, there is an opportunity to feed into one of the key priorities of the state council. There is a solid work program for 2018 with research on climate governance, oceans, biodiversity, sustainable agricultural and rural environmental improvement.

For the first time, the work programs include and even focus on the gender dimension of environmental policy research. Canada wholeheartedly welcomes more focus on this important area.

At this AGM, there are seven roundtables to discuss various thematic issues of great importance. Participants bring a wealth of knowledge and experience on environmental and sustainability issues. The urgency of our environmental situation calls for boldness, courage and innovative ideas.

b. Adoption of the CCICED Phase VI Charter

Li Ganjie led the Council in the adoption of the new Charter for Phase VI, which has been revised to enshrine the principles of diversity, inclusiveness and sharing, and clarifies that CCICED doesn't just support sustainability in China, but also globally. The Charter was officially adopted.

c. Vice Chairpersons' Remarks

Xie Zhenhua, CCICED Vice Chairperson, China's Special Envoy on Climate Change and Deputy Director of the Committee on Population, Resources and Environment of the Chinese People's Political Consultative Conference (CPPCC) underlined the following points:

In the past 25 years, the Council has played a unique and crucial role in environmental protection and ecological civilization, as well as China's governance system, modernization of its institutions and exchanges of information. China is connected to the world as never before.

Climate change is the biggest, most urgent global challenge. In 2017, storms alone caused property damage and loss of life. Millions of people had their lives destroyed. There were record floods around the world, including in China. The economic and human cost of an adverse weather event is massive.

The Chinese government is working on ways to reduce climate change by eliminating outdated capacity, restructuring the energy mix, and increasing forest coverage.

While China's economy grows, emissions have decreased, and environmental quality has improved dramatically. The lives of 100-million people have improved with increased employment as well. The new energy sector created about 32-million jobs, so the practice in China shows at the same time the economy develops, climate change can also be addressed.

It is already a fact the world is becoming warmer. In the next 50 years, the world average temperature will continue to rise. Even though there have been some setbacks, China will work with other countries to be part of this global effort to promote sustainability and to face the challenges. China will continue to shoulder its responsibilities and actively participate in global action and global governance reform.

Erik Solheim, CCICED vice chairperson, made the following comments:

At the 19th National Congress of the Communist Party of China, President Xi Jinping spoke more about the environment than any other global leader. I see two major policy shifts from this Congress. One is China moving from a narrow focus on economic growth to a focus on environment and social development.

The other change is that China is immensely focused on developing into a country that is now there to lead the world and partner with other countries. The pollution in China is coming down, due to the leadership clamping down on pollution, which shows government policy creates results.

The role of China is rapidly coming to the forefront of global affairs, and this forum helps with that critical role. The first time I visited China, there was one subway line. Today, Beijing and Shanghai have by far the biggest subway systems in the world, but more importantly there are maybe thirty cities in China with subways now.

The next area of focus in China is biodiversity and the need to protect wildlife. China eliminated ivory from the Chinese market. We can already measure the results in Africa as poaching is coming down. What we hope is that by 2020, Beijing can be for biodiversity and the protection of wildlife what Paris in 2015 was for climate change. A conference that will lift and inspire the world to find ways of cohabitation of wildlife and human, along with enhancing protection of national parks and wildlife, is needed.

Finally, across the BRI, we need to ensure this is the export of the greenest Chinese and global technologies.

Council vice chairperson **Zhou Shengxian**, CCICED vice chairperson and deputy director of the Committee on Population, Resources and Environment (CPRE), made the following comments:

In China, there have been dramatic reductions in pollution. What was achieved in a single year took more than ten years in developed countries. Residents say they no longer have to leave their communities due to high levels of pollution. People can feel the change.

CCICED vice chairperson **Achim Steiner** made the following remarks:

This China Council is meeting when the environmental dimension is changing worldwide. This is an exciting phase in front of us, one of which environmental development is often defined as a challenge. In many countries, the narrative is shifting toward it being more about the choices citizens, consumers and private markets make. The government must create the right regulatory frameworks that allow the transitions to take place.

Part of the China Council's role in the ecological era is to help inform experiences and choices. It is imperative to recognize that some of the fundamental drivers in the domain of financials and markets can be addressed. How are there going to be incentives to invest in these 21st Century green economies? We still have a fundamental misalignment, and some economies can invest in their structural transformation, but for most countries, this is still one of the challenges that remain. The China Council provides a forum for better international understanding and engagement, as a force for building a global community.

Vidar Helgesen, CCICED vice chairperson, then made the following points:

Human beings are proud of man-made achievements. It is important to recognize that humans are creatures of nature, which provides resources but also has its limits. Today, climate change is putting both man and nature at risk. A renewal of natural capital is needed to achieve an ecological and man-made balance.

It is pleasing to see the growing role oceans are taking on the global stage. Oceans are a source of life, but they are now being polluted in ways that threaten life. The role of forests, especially tropical forests, and land-use practices also deserve more attention.

The work of this Council will be all at once exciting, challenging and potentially highly rewarding because China's green transformation will be of particular importance to the world. For starters, environmental improvements in China will have a global impact, simply because China is so large.

Secondly, China is providing solutions to the world in the sharing economy, such as solar energy, electric transportation, eco-cities and reforestation. Thirdly, China is spearheading green finance. Finally, China is assuming global political leadership and forming partnerships in such areas as trade policy.

d. Keynote Speech by Li Ganjie, CCICED Executive Vice Chairperson

CCICED executive vice chairperson **Catherine McKenna** introduced **Li Ganjie**, China's Minister of Environmental Protection and CCICED executive vice chairperson. Here is a summary of his comments:

In the past five years, the Chinese government has strategically prioritized ecological civilization in governance. Since the 18th CPC Congress, China has witnessed and experienced dramatic changes in ten different areas, and ecological civilization is one of them.

In the last five years, the country has become more conscious and motivated to develop in a green way. As a result, China has changed its management approach, which has led to a shift from environmental protection at the operating level by agencies to macro-environmental protection led by government.

There has also been a shift in the environmental quality and supervision of businesses. In the past, only companies were monitored, but now governmental agencies are also supervised. Previously, a top-down approach dominated environmental management, but now there is a bottom-up approach as well.

The State Council has made unwavering efforts against pollution in water, air and soil over the last several years, and the efforts have already paid off. In Beijing and beyond, 200,000 small boilers were phased out, greatly improving the quality of life for people in the region. The shift from coal to natural gas has not only made the air cleaner but made cooking easier for local people.

The ecological civilization framework is taking shape with supporting laws, regulations and stringent environmental enforcement. These efforts are recognized and supported by local governments and the public.

Overall environmental quality has greatly improved. Since 2016, the PM10 concentration in 338 cities has decreased by 15.5 percent. There have also been significant decreases, as high as 30 percent in some cases, in the PM2.5 in Beijing, Tianjin, Yellow River Delta and Pearl River Delta. Acid rain has decreased by 7.2 percent, and 67 percent of water has reached Grade 1 to Grade 3 standards. Ten years ago, only 30 percent of water could reach the standard for Grade 1-3. Forest coverage has increased from 16.6 percent to 22 percent.

There are five important indicators according to the action plan. In the first 11 months of this year, the PM10 has decreased by 20.4 percent, but the second indicator is a decrease of 25 percent of the PM2.5. China has achieved all of the goals set by its action plan.

The goal for Beijing is to reduce the PM2.5 concentration to 60-mg per cubic meter. Statistics indicate this goal is achievable this year. With the implementation of this action plan, China can confidently say it is identifying pathways and approaches to control air pollution, which will facilitate work in the next phase.

e. Presentation of the CCICED Issues Paper

CCICED international chief advisor **Arthur Hanson** presented the issue paper: *Ecological Civilization Shaping China's New Era*. Here is a summary of his comments:

This document lays out what needs to be done for the short- and the long-term and includes relevant detail for the Council's future work.

Among the ten issues highlighted in the issues paper is a national 10-15-year strategy with a top-down approach to planning. If we are going to talk about ecological civilization, there has

to be an organic relationship with communities. There are huge challenges that won't be met in the next five years, but what is going to happen is a move from bad situations towards progress.

China doesn't have an adequate national strategy for the blue economy, as it lacks some environmental dimensions. There is also the social dimension; I was pleased to hear of 32 million new jobs created in China from the renewable energy sector, but what about all of these steelworkers and coal miners who are tossed out? How do we bring in the demographics of aging in cities? On the fishing side, where do fishermen go?

The point is how to make sustainable goals central features in China's many ventures. Related to that is developing an ecological civilization approach to China's investment and trade. My final question, as a starting point for the discussion, is will China become a green beacon for the world community? I think China can, and it can do it in an accelerated fashion if it so chooses.

The chairperson invited **Liu Shijin**, CCICED's Chinese Chief Advisor and former vice president of the State Council's Development Research Center, to present the task force on China's green transformation outlook 2020-2050. Here is a summary of his remarks:

Green development needs to include, but not be limited to, the traditional mode of development – i.e. the transition from the Industrial Revolution to the Ecological Revolution. While the Industrial Revolution brought great progress to humanity, it is not sustainable.

Some people say a greening development is costly; the fact is the current investment mode is costly, but most of these are not visible costs, and they are often ignored. Some see the green economy as a burden, but in many cases, it is more efficient and less costly. China needs innovative policies to ensure adaptive planning and to rethink the modern green economy.

General debate and comments

I am in a traditional sector of textile and apparel manufacturing, and I want to address issues on the transformation of industry. I am worried that we are looking only at benefits in new sectors, not old ones. I see opportunities with established industries. For example, devising ways to make clothes for the customer on demand, to reduce waste. We can achieve that on existing models if we use digital technology, but we need to address data integrity. I am also very concerned that we don't think enough about the impact of automation on the existing workforce.

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China's strong leadership in bringing an ecological discussion into the global arena brings hope. The sharing of experience and institutional knowledge presents a major opportunity for other countries that want to advance their response to ecological issues. These discussions and institutional changes will be valuable around the world. Institutional changes present opportunities.

The question is how do we create business models that enable these various goals to be put into action to help with the advancement of entrepreneurs? How do we inspire entrepreneurs to buy in? My suggestion is that the Council would want to look at these experiences. How do we develop narratives that also inspire the kind of long-term vision created in China?

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I want to congratulate China on its environmental achievements, but at the same time the CCICED should help get this story out. I don't think enough people around the world know about China's ecological civilization concept. Looking at the presentation regarding a vision and roadmap, my concern is that there is not a one-size-fits-all climate solution. I think what works in the Philippines may not work in Ethiopia.

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This narrative of ecological civilization is beautiful and inspiring, and it would be wonderful to translate that philosophy for business, to convey the narrative to the business community by sharing the ways it benefits and brings value to business.

3. Environment and Development Open Forums

a. Forum 5: Green Development Transformation in China and the World

CCICED vice chairperson, as well as CEO and president of the World Resource Institute, **Andrew Steer** chaired the Green Development Transformation Forum. He introduced CCICED executive vice chairperson and China's Minister of Environmental Protection, **Li Ganjie**, who made the following remarks:

Environmental and ecological problems are rooted in the way resources are used – due to economic models and lifestyles. There needs to be a shift to greener lifestyles. At the 19th CPC Congress, President Xi Jinping emphasized there should be harmony between humanity and nature, and that we need to save our energy and resources. So the environment must be protected by adopting strict laws and making lifestyle changes.

In recent years, the Chinese government has emphasized greening, opening up, sharing and innovation. New development approaches and lifestyle changes are important components of these policies, along with a determination to enhance ecological civilization. Protection of the environment equals protection of productivity through sustainable development. It is critical to shift our paradigm in order to keep mountains green and waters clean.

To meet public needs and balance economic development and the environment, China needs to succeed in its supply side reforms. Strict laws and enforcement help create fair markets and strong competition. For example, in Beijing and Hebei Province, the central government is pushing for 28 municipalities to quit heating with coal. This is providing environmental, social and economic benefits.

Green development, transformation and sustainable development are goals shared by the international community. China is willing to contribute, offering its wisdom and methods in order to realize the 2030 Sustainable Development Agenda.

The chair introduced **Achim Steiner**, CCICED vice chairperson and United Nations Development Program administrator. Here is a summary of his comments:

China is now influencing how we think about our institutions. China's chief advisor to the Council, Liu Shijin, demonstrated in his presentation that China is thinking along the lines of eco-civilization, which is a concept that is aspirational as opposed to transformational.

The world has adopted an agenda that has resulted in unsustainable development – financial, environmental, social. For a long time, the environmental movement was not recognized for what it was trying to do, which is to open societies' eyes to something that was nonsensical in the long run.

Years ago, the perception was that the more electricity you consumed, the better that was because the price per unit would go down. The first country to challenge this, not from an environmental perspective, was South Africa. Water became the medium through which new South Africa transacted a sustainability and equity agenda. Here the logic was turned on its head, where basically, the more you consume, the higher the tariff will be. A baseline of free access to water for every citizen was also put in place.

At the time, economists would have told you this was irrational, yet from a sustainability point of view, it was the kind of new thinking that was needed. The cost of water in South Africa grows exponentially by the amount that is needed because it is a scarce commodity, and socially it was inequitably distributed because the swimming pools were filled cheaply with water, while some people had no access to drinking water. This is a moment where there is a paradigm shift.

China is now willing to step out of its borders and take on a leadership role as a major economic player and geo-political partner. China will meet its SDG 2030 goals and the concept of sustainable development and consumption. It will be interesting to see how the China Council can connect thoughts and accelerate what has to be a global alignment behind these transitions and transformations because without that, the global economy becomes a risk to ecological civilization and the SDGs.

Many societies are polarized and facing threatening globalization. As President Xi attended the Davos Summit, another leader was withdrawing, illustrating how critical a moment in history this is in the context of a global economy. Environmental problems are now beyond boundaries, and transformation requires unity.

The Chair introduced **Yang Weimin**, CCICED member; vice minister, the Office of Central Leading Group on Financial and Economic Affairs. He made the following remarks:

The 19th CPC Congress, China marked the beginning of a new era. A key feature is the eco-civilization concept, which is a new mindset of green development. There are five environmental aspects always mentioned by President Xi Jinping, including harmony between man and nature. Mankind depends on nature – without it we can't survive, yet both man and nature are important. China must transition from the industrial civilization to the ecological civilization era, where man and nature can coexist. In the past, China's economy developed very fast, but at the cost of high pollution and high-energy consumption, which is not sustainable.

The second concept is that green mountains and lakes are also golden – it is about the economy. A healthy economy is essential for a better life, but so is clean water and air. Ecological spaces, such as farmland, forests, lakes, wetlands, help absorb CO₂, generate oxygen, purify water and much more. Only when these are protected will they provide the vital ecological products that are needed.

The third concept addresses how to develop without compromising nature. The key is to hand down a clean environment to the next generation. This means some areas need to have restricted development and some need to be forbidden to use. The proper extent of development will reduce human interference with nature and shorten the distance between where people live and work, which in turn reduces traffic.

The fourth concept is the management of water, mountains, rivers, lakes, prairies and grassland. As pointed out by President Xi Jinping, humans depend on water, which in turn depends on key natural elements and if those elements are threatened, it's impossible for us to have other elements that function. The laws of nature must be respected because every element is closely connected.

The fifth important concept is implementing strict laws and regulations to protect the environment. Human activities have done harm to nature. There needs to be a cap for the consumption of natural resources, which requires laws and regulations, along with taxation.

Jørgen Randers, professor, BI Norwegian Business School, Club of Rome board member and author of *The Limits to Growth*, spoke next:

I have worked for 40 years to further sustainable development in the world, and I am worried that although progress is there, it is too slow. Five years ago, I tried to calculate the pace at which we are moving and if we will reach our goals. This work was published in a book titled "*2052 – A Global Forecast for the Next Forty Years*".

This is about how the main challenge to humankind is the climate challenge, and that China will play a major role in solving the climate problem just as China has played a major role in solving the poverty problem. The book's message was not popular when it was published in 2012, but the forecast has stood the test of time.

The world population will peak in the early 2040s at roughly 8.5-billion people. The decline will occur because of a decrease in fertility rates in all corners of the world. Women are having fewer children, not only in the rich world but also in the poor world because poor people are living in urban areas and the cost of having children outweighs benefits in cities.

The second indicator is the world GDP. The world economy will grow much more slowly over the next 30 years than over the last 50 years. The reason is that all economies mature, meaning they move labour and capital into services and ultimately into care. In China, as of yet, it is a low- to mid-income country with a much higher growth rate than it will have 30 years in the future.

Energy use is an important aspect. What is happening is that the energy use per unit of value created, unit of GDP, has been coming down rapidly over the last 30 years and will continue declining, which makes sense business-wise. As a consequence, the world's energy use will continue to grow, but slower than in the past.

Once we know how much energy will be used, the important thing is to ask what type of energy will we be using? What will happen over the next 30 years is that renewables like the wind and sun will gradually squeeze out coal, oil and gas. First coal, then oil and then gas.

Since we know how much coal, oil and gas will be used, it is easy to calculate how much CO₂ will be emitted for energy purposes. The world's CO₂ emissions will reach a peak around 2035 and at 2050 will be back at today's level. There will be huge regional differences, with stagnation in the US going down; the EU will be stagnant and slowly increasing consumption per person; China will double five times its consumption per person in this period, and the rest of the world will double its per capita consumption.

The question now is what can we do about the main problem humanity faces – the rapidly increasing GHG emissions? Looking to the year 2100, humans will eliminate coal, oil and gas – meaning no emissions by then. Could we accelerate the green transition to avoid the temperature rise? Assume we make a plan where we eliminate the use of coal, oil or land gas earlier. Temperatures could peak below +2 degrees if a planned and rational action, with the decisive transition out of coal, oil and gas, is undertaken. Hopefully, China can lead the way.

Chair introduced **Han Wenxiu**, CCICED member and deputy director, the State Council Research Office, to speak on the first panel and discuss the links to the economy. Here is a summary of his remarks:

There have been three phases in China. Initially, China valued development over the environmental maintenance. People didn't care about pollution then, and there was no concept of NIMBY. In phase 2, China wanted economic development but also a good environment. When people have enough food, they pay attention to the environment. Phase 3 is when China said green mountains are becoming gold, giving priority to environmental protection and pre-conditions to development.

China has to maintain a reasonable economic growth rate, so there is a good macro-economic climate in which to deal with environmental problems. The number of heavy, high-polluting industries in China is high and should be reduced.

China needs to optimize the energy mix to reach the full potential of clean energy and to develop new technologies. PV and wind-power generation costs are still higher than thermal power generation, but the trends of lower costs and improved efficiency are evident. Another recommendation is to carry out ecological restoration work, as can be done in areas damaged by coal mines.

China is still a developing country, and therefore, the principle of common but differentiated responsibilities still applies. China will honour its commitments to the international community and, at the same time, deal with domestic conditions.

Diane Regas, CCICED member and executive director of the Environmental Defense Fund, spoke next:

The Saihanba ecological project is the largest manmade forest in the world, and serves as an excellent example of ecological civilization. The forest coverage in Saihanba is now 80 percent, up from 11.4 percent 55 years ago. The forest sequesters carbon, purifies water and provides habitat to hundreds of species.

The restoration generates tourism income and helps protect Beijing, which is downwind, from sand storms. As a result, the incidence of such storms has gone down by more than 70 percent.

The areas that will not support forests are used to generate wind power. The forest has also provided wealth to residents, with forestry workers earning three times the average per capita income of urban residents. The cost-to-benefit ratio is 1:20, which is a good return on investment.

The challenge now is how to scale up; this requires persistence and collaboration between ministries and local people. Getting the incentives right is critical to success.

Hans Mommaas, CCICED special advisor and Director of PBL Netherlands Environmental Assessment Agency, made the following comments:

The whole world benefits if China succeeds on meeting its targets. The task force discussion paper and the PBL modeling provide a comprehensive program comprising six pillars.

Two of these pillars are of critical importance. One focuses on economic issues while the other prioritizes people, and this social dimension matters because China still faces a serious poverty reduction challenge. The emerging middle-class is increasingly interested in ecological civilization, while also taking into account the broader agenda of social and regional equity. National ambitions need to be adapted to individual regions, not only in ecological services but in terms of landscapes and culture.

Trying to balance short- and long-term ambitions is a challenge. Carbon-capture storage is a good example. Because it can reduce emissions, CCS needs to be considered, but costs are still high. However, in the long-term, CCS could lock China into more innovative solutions. The question is how to balance short-term benefits and long-term ambitions in an integrated agenda? Ideally, China will link the emerging middle-income agenda with the development of policies that allow for balancing short- and long-term perspectives.

Wang Wenbiao is a member of the standing committee of the 12th CPPCC National Committee, vice president of China Chamber of Commerce, and chairman of Elion Resource Group Company. He made the following points:

One-third of China's land is desert, and the characteristics of desertification include poverty, vulnerable eco-systems and social instability.

I want to share how Kubuqi desert was turned into an oasis of green. Twenty years ago, Beijing had frequent sandstorms originating in this desert, the world's seventh largest. Thirty years ago, when we started to transform this desert, people there were extremely poor. After years of interventions and thanks to government support, several of the prevailing problems have been resolved.

After years of hard work, the Kubuqi has been reclaimed with growing areas covering over 6,000-square kilometers, as well as important economic growth and a reduction of poverty. However, more still needs to be done. The Chinese government, the UN and other international organizations need to renew the fight against desertification and ensure the Kubuqi desert success is better known around the world.

Xue Lan, professor and dean in the School of Public Policy and Management at Tsinghua University, spoke next:

We need the cooperation of different stakeholders along with innovation in concepts and technologies to tackle the challenges of green development. Agencies, universities and enterprises need to promote green development with young people. Public information is also key in terms of how social organizations and governments can improve their initiatives.

In China, social organizations complain about local government. Some local groups considered publishing information using web-based applications so the public can access data. This approach puts more pressure on local governments.

International cooperation in areas such as microfinance, which can contribute to poverty reduction, is also beneficial. The UNDP introduced microfinance in China, and it is now a thriving sector here. UNDP brought to China this information, and now UNDP is transferring China's experience to other countries.

Lin Jiang, staff scientist at Berkeley Lab's China Energy Group, spoke next. Here emphasized the following ideas:

China could promote economic growth and reduce pollution by investing in better technologies, which are available today. A transition to clean energy is possible, using the same amount of energy while reducing CO₂ – essentially returning to pollution levels of the early 1980s – by only using commercially available technologies. To achieve this, China would have to invest roughly \$35-trillion RMB over the next 30 years, but the savings would total some \$56-trillion RMB, a net savings of \$21-trillion RMB over time.

Green development requires not only technical innovation but institutional innovation as well. China's deepening market and power sector reforms could save electricity costs and reduce emissions without changing one lightbulb. Institutional reform is also a necessary part of capturing clean energy resources and clean energy savings.

China is already a global leader in many clean technologies and an expert in building infrastructure, so China can help other countries to transition to green infrastructure, simply by investing in wind and solar instead of coal plants. China can benefit by growing clean energy industries that will generate more jobs and better pay.

General debate and comments

Crisis situations drive innovation. To turn industrial civilization on its head to an ecological civilization is a remarkable insight that can only come when you face serious challenges. China is still in the process of rapid investment in infrastructure, creating opportunities for innovation.

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China has set examples for LDCs with new ideas, but green industries, like wind and solar farms, have also been successful. Globally, customers are enjoying low priced, high-quality renewable energy technologies thanks to China. Just like the production of information and communications technologies, China has brought these technologies to African countries. Even in areas where there is no electricity, people can use mobile phones thanks to Chinese technologies. If green industrial development is important to us, we must reduce existing trade barriers.

Dimitri de Boer, CCICED special advisor and China Country director for ClientEarth, chaired the second session of the forum. He introduced **Maria Krautzberger**, CCICED member and president of the German Federal Environment Agency, to discuss the transition to sustainable lifestyles:

The average German lifestyle is characterized by a degree of energy and resource consumption, amongst the highest in the world. This is partly the result of individual decisions, but extensive packaging is also a factor. This is the context for the German government's current efforts to promote a more sustainable lifestyle.

In 2016, the German government adopted a national sustainability strategy, which also set targets for sustainable consumption. The recently implemented national program on

sustainable consumption was drafted by several ministries, including environment, food protection and agriculture, and consumer protection. It outlines how the German government plans to strengthen sustainable consumption in various areas and turn this into a mainstream concept. It addresses various areas that will have the largest impact on reducing current pressures: mobility, food, housing, households, office, work, clothing, tourism and leisure.

Félix Poza Pena, CCICED member and CSO of Inditex Group, which runs Zara, made the following comments:

There are important drivers for sustainability in the fashion industry. The first is consumer preference for green products. Demand for green fashion is growing. The second driver is the pressure applied by environmental activists, which creates challenges for the sourcing of raw materials and use of chemicals in garment manufacturing. The third driver is legislation. For example, the European Union has been working on an ecolabel system for garments, which would impact the production of garments in terms of water consumption, energy and pollution.

In Europe, legislation of the fashion industry needs to be more transparent on environmental impact. The labels will influence the supply chain, which will impact China significantly because its factories and suppliers will have to meet these requirements.

Doug Ruley, general counsel of ClientEarth, emphasized these points:

The use of the law should be encouraged to generate green transformation. Embracing a green lifestyle requires societal acceptance, and the law can embed those values in the public consciousness. An example of the influence of the law in the integration of social values in the green transformation is the multi-country and multi-year campaign on air-quality directives focusing on human health throughout the EU.

When EU member governments failed to meet the directives, NGOs brought cases against them to enforce it. We saw the impact in the diesel vehicle scandal, and now lots of cities are phasing out diesel vehicles. In coming years, some companies have committed to build only electric cars. Tesla now has a greater market value than General Motors.

The law can play similar roles in other aspects of the shift to green lifestyles, including power generation, food production and consumption, plastics reduction, and fisheries and forest management.

Ren Yong, director-general of the Environmental Development Center of Ministry of Environmental Protection, outlined the following ideas:

Green consumption is key to a green lifestyle. China is changing its economic development mode, particularly in the last five years as it pursued supply side reform. The Chinese government is prioritizing consumer behaviour in improving the country's ecological footprint. For example, 90 percent of this footprint comes from the food and transportation industries. Household emissions are actually 2.8 percent higher than for some industries.

Everybody knows China is a big country when it comes to the consumption of electronic devices, particularly mobile phones. E-commerce is popular in China with the delivery industry generating billions of packages. This represents a huge waste of resources.

If the green transformation is realized, it will address the relationship between consumption and production. If China does well on the consumption side, it can help the production side. The Chinese government takes this seriously. Comprehensive policies and solutions to realize the green transformation are required.

Alex Wang, assistant professor of Law, UCLA School of Law, made the following remarks:

People are rational actors and respond to incentives. Much more needs to be done in this area, instead of focusing on punishment to motivate right behaviours. The way to motivate people is to appeal to their moral value, such as promoting the value of enhancing the quality of life.

Sometimes behaviour changes are limited by lack of capacity, so we have to find ways to reduce the barriers to change and look for more legal ways to appeal to people. The anti-littering campaigns of previous decades, or the banning of plastic bags, which reduced plastic on beaches in California by 60 percent, are examples of effective communication strategies. Labelling garbage cans 'landfill' can also have an impact on perception.

General debate and comments

We need to change consumption by improving the tax system. We need to promote a sharing economy, where if you own something, you need to pay a higher tax; if you share it or rent it, you pay lower taxes. We should foster a culture that prefers the utilization of materials to the ownership of materials. Tax mechanisms and consumer culture need to change.

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Green transformation for green development is an innovative approach, but we need to do more research on societal risks related to green transitions. For example, this year the government switched from coal to natural gas in the heating systems in Beijing. However, the change brought problems because we weren't prepared for it. With careful preparation, costs can be lowered and policies and programs become more acceptable.

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I come from South Africa, which relies heavily on its natural capital. Some of the issues resonate with my government experience. South African laws also include related regulations, and South Africa puts the emphasis on planning and the state sector's involvement. But the issue is, how can this be extended beyond the purview of the environment ministry?

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People are not only moved by their values but by their physical environment. For example, China used to be a country of cyclists, but over the last 30 years bike lanes have been invaded by other users, so it's difficult, even dangerous, to cycle in China today. If we want to

encourage cycling, we have to provide clear, safe bike lanes. After all, city streets belong to everyone, not just drivers. Investment in public infrastructure is required to influence human behaviour.

Li Ganjie concluded the forum with the following remarks:

During the process of green transformation, we will encounter obstacles and risks. How does China address these challenges, minimize costs and improve the chances of success? The public should be educated, so they trust the process and have the patience needed to protect the environment. Years of damage, take years to repair. China must prepare for a long battle.

It is hard to choose the right balance between development and protection. It requires solidarity, with everyone working together. This applies to China and other countries as well. Solidarity is needed among regions, sectors, people and industries.

In some cases, we may have made premature decisions. Forty years ago, it was impossible to tell people not to cut trees for fire wood. Now, China's changes and progress are evident. Innovation is a critical problem solving strategy in China and elsewhere. Green development and ecological civilization are rapidly gaining ground and generating change, with important results in terms of momentum and dividends. China must find a way to both protect the environment and develop its economy.

b. Forum 6: Clean Energy Strategy and Climate Change

The forum was chaired by **Xie Zhenhua**, CCICED vice chairperson and China's special representative on climate change and deputy director of the Population, Resources and Environment Committee of the 12th National Committee of the Chinese People's Political Consultative Conference, and **Catherine McKenna**, CCICED executive vice chairperson and Minister of Environment and Climate Change, Canada.

Xie Zhenhua introduced the first speaker, **Wang Yiming**, vice president of Development Research Center of the State Council, who made the following remarks:

The Council's discussions will help China to implement and achieve the goals set by 19th CPC Party Congress and also help us reach consensus on sustainable development. In the recent Bonn conference, China, together with many parties, agreed on the Results Paper, which boosted the confidence of all countries to achieve SDG and to actively participate in global governance. This will be important for China to achieve its national strategy.

Green development, despite the imbalance, is progressing with some regions seeing more results. However, uncertainty still exists. Given the positive momentum of emission reductions in China and the fact that renewable energy meets 40 percent of energy demand, investment in renewable energy takes up two-thirds of all power plants in the world. Green development challenges are reflected in the imbalanced changes.

The Chinese national strategy, which is to build and achieve equal civilizations, has received wide attention. The CPC has made it the priority of all works and started implementing the main function zones, and also took concrete actions to treat pollution and carried out environmental rehabilitation projects.

The public, in general, is increasingly satisfied with the results. A nationwide survey found that 70 percent of those surveyed were satisfied with the improved air quality. There are still many challenges, including sluggish world economies and market uncertainties, which reduce confidence in green technologies. Developing countries are still limited by the green technologies available to them.

Apart from all of these green development strategies, there is a lack of research, and more studies are required. The Chinese development model has imposed complex environmental challenges. China wants to be proactive in leading the world toward green developments. To achieve its green to gold strategy, China must increase and improve the quality of development and better meet the demands of people socially, economically and environmentally.

By the end of the century, the goal is to make China a modern, civilized society, ecologically, economically and spiritually. China is now more actively seeking and exploring institutions and systems to achieve green development and has established an environmental auditing system, supervision system, along with other mechanisms. China is also paying attention to the market as a driving force of green development.

Eric Heitz, CEO and co-founder, Energy Foundation, spoke next. He made the following remarks:

The Paris Agreement is a crucial milestone in the right direction, and China should be applauded for its role. A clean energy strategy is key to meeting the targets. It is not the only piece, but energy is at the heart of the challenge, and China must solve this challenge for the globe.

The question is how to develop economic policy in a more integrated way? In other words, how does low-carbon prosperity become the mainstream economic path? China has a history of strong sectoral policies, perhaps some of the best in the world. Look at China's industrial efficiency program; it's arguably the most effective single program for reducing carbon emissions globally, ever. Look at solar, electric vehicles, or equipment standards; they have contributed in major ways toward allowing China to realize a low-carbon trajectory.

Air quality is another area where China's policies have set the bar for ambition and, in some cases, implementation on achieving air quality.

While sector policies are good, they are not good enough. China now needs a much more integrated policy. The question is how to integrate a clean energy strategy into the economic engine? The narrative that the low-carbon path can be economically successful is intriguing.

Taking a low-carbon path has measured co-benefits that should be considered, as sometimes they are ignored.

China's views and actions are more important for global trade and generate benefits for China and other countries.

Catherine McKenna chaired the next session on the relationship of short, medium and long-term climate change goals in development. She made the following brief remarks:

We considered, in the context of China, what was achievable by 2030 and what is necessary by 2050. It is true that a long-term plan is required. Under the Paris Agreement, each country not only communicates a nationally determined contribution every five years, with each NDC being more ambitious than the last, it also invites countries to communicate mid-century low-emission development strategies to think about what low-carbon economies will look like by 2050.

Canada went through this exercise, considering various growth and innovation pathways to reduce emissions to at least 80 percent below 2005 levels. This is a living document to build a low-carbon economy. In China, this is also an interesting and useful exercise, which is essential if we are going to move to a clean, low-carbon future.

How do we move to cleaner energy? One of the biggest efforts is to shift away from coal. Every country may be on a different timeline, but one of the co-benefits is cleaner air. Ontario eliminated coal and went from 50 smog days a year to zero, which resulted in fewer children with asthma, fewer visits to the hospital and fewer premature deaths. That is a tangible benefit that people appreciate and recognize.

It is important for government and business to reimagine how things are done and to aim for a clean energy future. The good news is that prices for the needed technologies have come down, and China is now a leader in clean energy.

One of the biggest challenges for everyone is jobs and communities. In the Canadian province of Alberta, this shift could affect workers and their communities. Determining a just transition is critical. The issue is not unique to large energy sectors, but governments need to set targets and help find solutions to support workers and communities.

There are excellent leadership examples, providing clean energy strategies – without which the Paris Agreement targets will not be reached. More importantly, we need to ensure the future we leave our children and grand-children will not be substantially worse.

The chair introduced **Jonathan Pershing**, program director of Environment, William and Flora Hewlett Foundation and former U.S. State Department special envoy for climate change. Here is a summary of his remarks:

In the past, governments considered the least costly options, ranked them and chose the cheapest. This was appropriate because there was little political will and hence no possibility to

look at long-term, least-costly next steps. Not enough was done, with only short-term, incremental steps taken, many of which could be dead ends.

For example, coal generating stations could be more efficient but return on investment was not sufficient. By looking at 2050, a long-term horizon, requires transformative thinking with far-reaching outcomes. Long-term vision is required for infrastructure, technology priorities and institution building.

The 2050 goals are within reach, with current infrastructure investments surviving until then. This enables stakeholders to engage in a long-term vision and narrative to frame next stage discussions. To reach critical goals, all sectors of the economy must be tackled.

Sizeable negative emissions in every sector are required in order to achieve goals. The right kind of investment needs to drive the process. Thinking about 2050 articulates goals for the power and transportation sectors; this also determines technology and land-use investments.

Changes will be required everywhere and the global community must be engaged. China is performing well, demonstrating both the pathway to deep emissions reductions and the pathway to considerable economic benefits. These are new goods and services that will open future transactions, which will be lucrative and drive domestic jobs and a clean economy.

China is leading the world in green technology, manufacturing and transport. But more can be done. It is essential to think of this in a holistic way, as a green climate priority, as opposed to considering this simply as a trade or economic priority. Otherwise climate change will grow out of control even if China continues to succeed in this area.

In conclusion, the 2050 pathway gives you some clear next steps, a transition from incremental change to a long-term vision. We have systems that are already being developed to think about how to do this; this group could do more of that work. If considered in a positive light, there is an incredible incentive to move in this direction.

Jos Delbeke, director general for Climate Action, European Commission, spoke next. He made the following points:

The EU initiated action in 2005 and succeeded in reducing emissions rapidly. The EU is ahead of its 20 percent target and is setting implementation measures for 2020. By 2030, the EU will have reduced emissions by 40 percent. However, cuts will have to double annually to reach the 2050 targets. This will require clear changes in investment patterns and radical changes in technology.

The EU has succeeded in decoupling emissions from economic growth, which means that per unit of GDP, the EU is cutting in half CO₂ intensity. The reasons for the successful transition to low-carbon are strategic vision, regulations, enabling policies and governance. The EU has a proactive regional policy; there is routine tracking of data by sector and by member state. However, there is a realization that this is not sufficient, and that action is required to green private finance.

Zou Ji, president of Energy Foundation China, made the following remarks:

Over the past 60 years, China has achieved fast growth by increasing investments, but there has been an over-investment in production factors. Certain growth rates are essential to maintain employment and social welfare. The key lies in determining what should generate growth. This should come from enhanced efficiency.

The carbon-price policy adopted by the EU was mentioned. By making carbon more expensive, investors are motivated to invest in low-carbon technology, resulting in the low-carbon transition, which is consistent with achieving social and economic development goals. Such innovation is the only solution for China.

He Jiankun, former executive vice president of Tsinghua University, spoke next:

Developing countries should grow while attending to poverty reduction and combatting climate change. If China can reduce emissions and cut carbon intensity, a 3-4 percent reduction goal could be reached.

In the past ten years, a carbon reduction of 1 percent has been achieved; even the most developed countries have only realized a 2 percent cut. To date, China has realized a sustainable goal of 4 percent carbon reduction; therefore, in the future, carbon intensity per unit of GDP could decrease. Realizing this goal requires long-term consideration and choosing the ways and means of reducing emissions.

Wang Yi, member of the standing committee of the 12th National People's Congress of China, professor and deputy director-general of the Institutes of Science and Development of the Chinese Academy of Sciences, spoke next. Here is a summary of his comments:

A more integrative transition should be expected, which encompasses institutions, energy, environment and society. The process will take time.

Considering the example of poverty reduction, despite China's rapid progress since the Second World War, there are still sizeable challenges ahead because there are still 40-million people living under the poverty line. Many other countries face the same situation as China.

Secondly, there does not seem to be a clear vision of the target to be reached. There needs to be a multi-step strategy. There was mention earlier of electric vehicles, but there are quality problems with their batteries. Clarity is required in terms of production in order to ensure the achievement of this low-carbon goal. Cooperative leadership is needed for success. China must work with other developing countries and share risks.

David Sandalow, inaugural fellow at the Center on Global Energy Policy and co-director of the Energy and Environment Concentration at the School of International and Public Affairs at Columbia University and former undersecretary of energy (acting) and assistant secretary for Policy and International Affairs, the U.S. Department of Energy, made the following points:

Here are three suggestions for promoting clean energy: the first is to establish green metrics for greening the Belt and Road Initiative. The project will require trillions of RMB over the coming decades. Secondly, the 14th five-year plan must shift its renewable deployment targets to renewable generation targets. It is well known that China deployed more solar power than any other country in 2016, but it is the United States that used more solar power than any other country in the same year. One tool for promoting renewable power in China might be to move to renewable generation targets.

The third suggestion is to invest in carbon dioxide utilization. One way would be to take carbon dioxide and turn it into useful products. This country has been a leader in the utilization of carbon for many years, but globally the research in this area is small, and China could take the global lead in this area.

Scott Vaughan, CCICED member, and president and CEO of the International Institute for Sustainable Development, spoke next:

It is an extraordinary tipping point that we are looking at cost convergence between conventional energy and renewable, clean energy. The numbers are getting closer and closer, so why are we not seeing more of a shift?

One way would be to remove negative fiscal policy elements. There is a lot of attention on fossil fuel subsidies, with some \$450-billion a year of government spending to subsidize fossil fuels. The good news is they have come down.

The second approach concerns green finance where China has been a leader by not just adopting one tool – green bonds, or green insurance or green stock exchange. China has laid out a multi-year system of managing green financing using multiple tools.

Anthony Cox, acting deputy director of the Environment Directorate, Organization for Economic Co-operation and Development (OECD), made the following points:

Climate policy is not set in a vacuum; it is influenced by and influences the full range of policies which are available to governments, including competition and market policies. These need to be integrated, otherwise governments are fighting the climate challenge with one hand tied behind their backs.

Bringing together the climate and growth agendas was the task handed to the OECD last year. If there is a strong climate policy, along with fiscal and structural policy reforms, then climate goals can be achieved and growth rates can reach 2.5-2.8 percent a year by 2050. And GDP growth benefits from avoided climate damages are taken into account, that growth dividend could reach around 5 percent. The key message is there is a double dividend, but we must take an integrative approach.

General debate and comments

We need to also consider technological change and the impact of policy and institutional frameworks. Consider green lighting LED and cars – both examples of technological advancement doing more than policy changes. European countries do impose strict emission reduction, but the EU does not encourage technological advancement. We can't overlook the importance of technology.

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The importance of the Belt and Road Initiative must be stressed. This is an area with a population that is three times that of China, requiring a \$5-trillion US investment per year. If nothing is done, the BRI area is going to emit three times more CO₂ than China in 20-years' time. To show just how massive the problem is, a couple of months ago China's green finance committee published a document for Chinese investors. However, China's investment is still too small. We need global leadership to organize the implementation of green standards.

Chair **Xie Zhenhua** opened the second session, introducing **Åsa Romson**, CCICED member, former Minister for climate and the environment and former deputy prime minister, the Kingdom of Sweden. Here is a summary of her comments:

I was asked to speak on synergies between climate change, policies and social, economic development. From a policy point of view, one of the challenges is to get the work done, as opposed to just talk about it.

I would like to underscore what Minister McKenna said in her introduction, which is that we cannot highlight enough the multiple synergies for better health from climate policies, especially from the energy sector. For many, improving air quality in the short-term is an even higher goal than climate change. Climate change is not close enough to people, but when it comes to air pollution, they see it. I suggest placing health objectives very high.

We must be clear that there might be trade-offs. For example, we know a lot of land-use policies that have benefits and downfalls. Investing in common infrastructure for energy, transport and treating wastewater are immensely important policies that have a lot of social development implications.

Sweden has employed several beneficial, sustainable development strategies, such as eco-governance, eco-laws, eco-taxes and innovation; it has involved citizens and adopted system solutions. Sweden wants to be one of the first countries to be fossil-fuel free, and that is an area where we are happy to compete with China or any other country.

Ma Jun, CCICED special advisor and chairman, Green Finance Committee of China Society for Finance and Banking, and former chief economist, Research Bureau of the People's Bank of China, spoke next:

China started thinking about a green financial system in 2014. At that time, a domestic task force was initiated and delivered 14 recommendations on how to set this up to top policy makers. There is a realization that every possible financial instrument, every incentive needs to be used to set up mechanisms that allow the markets themselves to allocate private sector resources more efficiently. By 2020, every company will have to disclose environmental information. Information is the only way markets can allocate resources efficiently.

Government alone cannot generate such a market; it can provide about 10 percent of funds, but the other 90 percent has to come from the private sector. The mechanisms are now in place to reduce costs and incentivize more to join the green investment space. Many other countries are now beginning to issue green bonds for the first time. Globally, green finance is gaining strength. There are now 50 green development funds launched by local governments, and many innovative projects have been launched including green building, as well as solar and wind insurance.

But despite these efforts, green investment remains a small part of the overall bond market. The challenges are a lack of positive signals, adoption of investment principles and low capacity.

He Kebin, CCICED special advisor, dean of School of Environment, Tsinghua University, and member of the Chinese Academy of Engineering, made the following points:

Clean energy promotion should be precisely targeted and its relationship with climate change should be emphasized. China has established the relationship between PM2.5 concentrations and air quality. In most of China's cities and provinces, it is expected that by 2035, air-quality goals will be achieved. A clean energy strategy will happen thanks to pressure from poor air quality.

The second issue is pollutants – 80 percent of which are related to energy activities. Clean energy strategies will provide solutions to such fundamental problems. From 2013 to 2017, PM 2.5 declined by 30 percent.

Stephen Heintz, CCICED member and president of the Rockefeller Brothers Fund, made the following remarks:

The Rockefeller Brothers Fund's work in China focuses on the links between pollution, human health, climate change and energy. The source of our wealth was John D. Rockefeller and the Standard Oil Company, the world's first fossil fuel giant. Historically our investments were misaligned when it came to our philanthropic work. As a result, in 2014, we decided to divest our holdings in fossil fuels and invest that capital in green energy and sustainable resources.

The moral argument got us halfway to the decision to divest, but what really convinced our board of governors was the economic argument. Market analysis suggests that if we as a global community have any hope of remaining below two degrees, much less 1.5 degrees, 60-80

percent of the known fossil fuel reserves will have to remain in the ground, unburned, which means they will become stranded investments.

When we made the announcement to divest from fossil fuels, we joined a global movement of 180 other institutional investors and 500 individual investors with total assets in the aggregate of about \$50-billion US. Today, there are nearly 800 institutional investors and tens of thousands of individual investors with aggregate assets of \$5.5 trillion US. These include the Norwegian sovereign fund, which is already divested from coal, insurance companies, the State of California teachers' pension fund, and more.

People are beginning to understand that if you are a long-term investor, fossil fuels are the investment of the past, not the investment of the future. It didn't take government incentives for us to do this; it was simply a moral judgement. We are in an urgent moment and making fateful decisions that will either save this planet or allow it to decline. Our economic data suggests that fossil fuels are the industry of the past and therefore a poor investment.

Kathleen McLaughlin, CCICED member, president of the Walmart Foundation and senior vice president, Chief Sustainability Officer for Wal-Mart Stores, Inc., emphasized the following points:

As a retailer, Walmart recognizes that two-thirds to three-quarters of emissions, deforestation, waste production and other environmental impacts come from consumer goods, from the consumption of what we sell. Walmart now considers the supply chain of every product sold and addresses the social and environmental hotspots in the whole system.

Walmart became the first retailer to sign on for evidence-based targets for emission reductions. Walmart will work to reduce emissions in line with what would be required of any retailer within our industry to stay within the two-degree world. This applies to Walmart's operations, but also its supply chains where most of the emissions are generated.

Walmart has focused heavily on energy efficiency – in China, for example, there has been a 10 percent reduction in energy use through the years. Secondly, Walmart's goal has been to reach 50 percent energy from renewable sources by 2025. This is achieved primarily through power purchase agreements. Walmart's growth has now been decoupled from emissions. Most exciting is the supply chain work related to Project Gigaton, a sustainability platform inviting suppliers to join Walmart in committing to reduce greenhouse gas emissions resulting from their operations and supply chains.

Dietmar Grimm, president of the Paulson Institute, made the following comments:

The Paulson Institute is focused on improving US/China relations through sustainable economic development and conservation. It is daunting to consider the dramatic evolution required.

To reduce risk in a low-carbon market, we need open trading where capital can move freely. We need strong support from global businesses, strong leaders in the private sector that will find innovative ways to solve problems – with good guidance from the government.

Hendrik Wolff, associate professor of the Department of Economics, Simon Fraser University, made the following points:

The CCICED has a dual role to play. For example, the city of Shenzhen invested in 14,000 electric buses. In Vancouver, we had a meeting on the future of transportation, and the CEO of TransLink was proud to announce a pilot study in 2019 involving four electric buses. The Shenzhen investment is remarkable and should be applauded.

China, with so many different cities and jurisdictions, has the opportunity to test different policies. That isn't done much in western countries, but one could imagine one city investing into hybrid technology, one into electric vehicles and another into hydrogen fuel. Such controlled experiments would help determine which of the technologies is promising because it's difficult for experts to predict how these technologies work out at scale in the real world. The importance of experimentation should be underlined.

Prices are of fundamental importance. Get rid of subsidies, and ensure prices reflect both marginal costs and marginal damages. Then, the market can function and there is little need for the proliferation of complex environmental regulations. There are often unintended consequences when policy makers impose taxes.

The social and political implications of climate policies are still difficult to determine. Much of the discussion centres on long-term solutions and in that context, there is sufficient time to invest in education.

Germany has a dual education system, where for the first two to three years, a new employee has a chance to enhance their credentials. For example, a German coal worker who is now 40 years old can access training for a second career, which might provide an easier transition into promising employment.

Xie Zhenhua asked his co-chair **Catherine McKenna** to conclude the forum. She made the following remarks:

When we question whether we are going to achieve the needed change in time, you can look at what China has achieved in the last 30 years. If there is a will, there is a way.

The changes can be made, but they require focus and hard work. The China Council's recommendations are important in helping China consider the role it can play globally.

Co-chair **Xie Zhenhua** summarized the session with the following comments:

Tomorrow, Minister McKenna and I will travel to the Paris climate change talks that will focus on financing. China's government representative will discuss the measures we are taking. My

job is to discuss how the Chinese government public fund can play a role in climate change action. I will suggest that government adopt a long-term vision, target its investments, strengthen regulations and encourage innovation.

c. Forum 7: Green Belt and Road Initiative and the United Nations 2030 Agenda for Sustainable Development

The Open Forum was chaired by **Zhao Yingmin**, CCICED secretary general and Vice Minister of Environmental Protection, **Erik Solheim**, CCICED vice chairperson and UNEP executive director, and **Hans Friederich**, CCICED member and the director general of INBAR. **Zhao Yingmin** made these opening remarks about the Belt and Road Initiative:

Since 2003, when the Chinese government proposed the BRI, there was tremendous support expressed; the BRI now has over 140 countries and 80 international organizations participating. In May 2017, the Belt and Road Forum for International Cooperation was held in Beijing, and the statement issued at its conclusion stated joint efforts will be made to advance the BRI, promote connectivity, boost cooperation on environmental biodiversity, natural resources, climate change and energy efficiency.

The concept of a green BRI is to pursue ecological civilization and green development, apply green standards and technologies, promote green connectivity, and enhance the capacity for green international cooperation. This also represents a major step for regional sustainability and the UN's SDG 2030.

President Xi Jinping also advocated for the establishment of the Belt and Road Green Development International Alliance, an eco-environment big data platform. This year, MEP introduced the Belt and Road Cooperation Plan for Environment Protection to enhance policy, carry out cooperation on environmental industries, and capacity-building to promote sustainable production and consumption.

Today, environmental scientists, diplomats, entrepreneurs, government officials, and representatives from international organizations, financial institutions, and NGOs from around the globe are here. Such diverse participants will contribute multiple perspectives and voices.

The Chair introduced **Erik Solheim**, CCICED vice chairperson and head of UN Environment, who made the following remarks:

In the years after the Second World War in Europe and North America, the American Foreign Minister George Marshall gave his name to what was later called the Marshall Plan, the United States' plan for the reconstruction of Europe after the war. The BRI, to me, is very different. It has a much more private-sector approach. It's more wide-ranging, and it does not come at a time when most nations are devastated by war. So, it's different, but the potential implications and potential magnitude are the same. If we want to green this initiative, we need to take into account that it's very broad, basically global, and it involves a large number of entities in China.

The UN Environment has, under the leadership of the Minister of Environmental Protection, formed the Global Alliance for the Greening of the Belt and Road. It's an open platform where we want to work with partners to green this initiative. MEP is setting up a knowledge platform, a database where people can access knowledge on the Belt and Road.

The chair introduced **Ou Xiaoli**, Office of the Leading Group for Advancing the Development of the Belt and Road Initiative. Here is a summary of his comments:

For China, the BRI is an effort to expand international cooperation. In the short-term, the BRI is a golden opportunity to speed up interconnectivity and capacity building. It stabilizes the world economic and trade systems. In the long run, the BRI provides an inclusive platform for the benefit of many countries.

Since Chinese President Xi Jinping proposed the concept in 2013, more than 100 international organizations and countries have joined this initiative. Over the past four years, the BRI has made enormous progress. Green development and environmental protection are priorities of the BRI in terms of establishing a Silk Road economic zone and a 21st Century Maritime Silk Road.

China is committed to guiding the development of the BRI, using the concepts of ecological civilization in order to protect, conserve or remediate natural resources. China and countries in the BRI area will strengthen their cooperation in biodiversity, protection of natural resources and combating climate change.

Frank Rijsberman, director general of Global Green Growth Institute, spoke next:

Opportunities exist to green the BRI. I now live in Korea, a country that has quickly made the transition from poverty to wealth. Economic growth is still the number-one priority for countries around the world.

What is commonly agreed is that economic growth needs to be both sustainable from an environmental perspective, and socially inclusive. There are many examples of how that can be done.

There is a close connection between the green BRI and achieving the SDGs. More and more countries are jumping on the green-growth bandwagon. We now have 28 member countries that have ratified our establishment agreement and another 20 or so that are on the road to membership.

We used to say that it wasn't expensive to do the environmentally right thing, but we now say, 'In fact, if you invest in green economic growth, if you green the BRI, it will lead to increased growth.' The quality of growth matters. It often starts with having the right kind of economic planning and mainstreaming green ideas into economic development policy. The next big step then is investments, green finance and climate finance into investments such as the BRI.

Vidar Helgesen, vice chairperson of CCICED, and the Minister of Climate and Environment in Norway stressed the following point:

The green BRI is about connecting countries and continents, and the SDGs are also about connecting and integrating development goals and countries; the SDGs are applicable for developed economies and developing countries alike.

All countries are developing together, with China being the most impressive development story over the last decades. Over time, Europe has been an impressive story of economic development, social justice and peace. There are new opportunities for collaboration between China and Europe on supporting global progress for poverty reduction and environmental improvements.

Europe is also giving priority to energy transformation and energy integration and invests heavily in innovation. Norway is electrifying its ferry fleet and has opened the first operational fully electric ferry in the world. In a few years, there will be fifty electric ferries. While development costs are high, the return on investment takes only a few years.

The business case for green finance is getting stronger, but we're still talking about the early phases of the transformational system that is needed. Brown or gray finance is still dwarfing green finance globally.

China's leadership in making green finance part of the G20 agenda is crucial, and hopefully, China will remain a champion of green finance in the G20 context and bring this approach to the BRI, which will send an important signal to markets. Finally, within the BRI, we also need to work together on ensuring green supply chains.

Khut Chandara, CCICED member, and Under Secretary of State, Ministry of Environment of the Kingdom of Cambodia, spoke next:

There is an industrial park project in Cambodia, which was implemented as part of Cambodia's national strategic development plan and in connection with the BRI. Called the Sihanoukville Special Economic Zone, this is a new international industrial and trade park and a new industrial town with a good environment. SSEZ fully complies with environmental regulations and has been through an environmental impact assessment. There have been minimal social and environmental impact reports, but great economic benefit for both investors and Cambodia, including over 14,000 jobs and improved living standards.

Cambodia acknowledges its environmental issues and limited capacity to address them. There are several infrastructure project plans, which if implemented would put pressure on the environment. The Royal Government of Cambodia has been working hard to formulate legal improvement, establish institutional frameworks, and mainstream sustainable development policies into national and sub-national development plans.

Currently, Cambodia is drafting the environmental code, which aims to ensure social and environmental safeguards in line with best international practice. Cambodia is also learning and improving its capacity through the BRI.

Hans Friederich chaired the next portion of the meeting, introducing **Joachim von Amsberg**, CCICED member and vice president of the Asian Infrastructure Investment Bank. Here is a summary of his remarks:

The BRI takes place through investments in specific projects, with banks financing them, engineers designing them. In discussing the greening of BRI initiatives, there has to be consideration of greening-specific projects.

AIIB was opening its doors in 2016, one month after the Paris Agreement came into being, and a few months after the SDGs were agreed on by the global community. The AIIB was the first multilateral development bank established following the two landmark international agreements.

The AIIB has a role in greening the BRI: one is selecting the right projects; secondly, the projects must be implemented correctly by observing the right environmental, social and governance standards; thirdly, financing has to be done sustainably. Many types of infrastructure need to be financed by the public sector because revenues cannot be collected; in this case, the sustainability of governance is essential.

Wang Dan, executive vice president of the Silk Road Fund, made the following comments:

Many countries in the BRI area have uneven development, with different environment and ecological issues. In promoting green development, tailor-made solutions need to be developed for different countries.

The Silk Road Fund became operational in 2014 and aims to provide innovative financing for different projects for the benefit of green development. We have long-term and sustainable funding sources and can also bring along other sources of capital for projects.

The Silk Road Fund will give priority to energy-efficient green projects such as hydro power, wind power, and other renewable energy projects. Our first investment project is a hydropower station in Pakistan, which will help alleviate power shortages and promote clean energy adoption. Apart from the profit-margin indicator, the Fund also considers project contributions to the environment and local employment. Many traditional industries of China can also use financing to adopt advanced technologies to achieve more energy efficiency and cut emissions.

Wang Tianyi, CCICED member and executive director and general manager of China Everbright International Limited, spoke next. Here is a summary of his comments:

Efforts need to be made to reach consensus on development. For many countries in the BRI, the 'green is gold' notion has yet to gain acceptance. It will also be critical to recognize we are

building a shared future for humanity. We need to set up a green development insurance plan because, from an investment point of view, there are enormous risks. One type of risk is political. BRI countries have faced frequent government changes; more than 40 percent of these countries have changed state leaders twice in the past ten years. The PPP model should be considered, and good examples of this approach can be found in Europe.

The chair introduced **Wu Shunze**, director-general, Policy Research Center for Environment and Economy. He made the following comments:

Green finance is a fundamental driver for the development of the BRI, but it can be too general in that different countries have different definitions of green finance; some projects use the term simply to gain an advantage over rivals. There needs to be full-lifecycle EIAs and other assessments to identify projects that are truly green.

A number of green projects do not offer decent, long-term returns. There needs to be stronger investment in waste treatment, remediation and environmental improvement projects. In the context of the BRI, each country's comparative advantages need to be given full play. There has been great growth in the export of environmentally friendly products. This is a new area of trade growth, but there are still tariff and non-tariff barriers.

There are also efforts to combine environmental protection with poverty reduction and the improvement of living conditions in rural areas. Attention must be paid to the potential ecological risks and loss of biodiversity in the drive to reduce poverty in rural areas. China needs to be aware of the role infrastructure has played in socioeconomic development, especially for environmental protection in terms of pollution treatment.

General debate and comments

It's essential to start connecting to a national planning process. Infrastructure is complex, and it can be easy to forget how difficult countries find it to soundly implement large projects. China has a robust implementation capacity, which other countries in the region do not possess. A large-scale project like BRI needs to be rooted in the national institutional and planning frameworks.

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China is intent on ensuring the development of the BRI is in line with national economic development plans. Such plans exist in Kazakhstan and other BRI countries. Chinese investments have to be coordinated with each country's national plans. Some financing entities pay attention to the project's contribution to green development, which is also an integral part of the entire project evaluation process.

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The BRI countries are not only linked by land, but also often share territorial waters. As the BRI develops, it is inevitable that this will affect marine areas. However, the ocean is fragile and

there is still so little known about its ecosystems. Consideration should be given to water and how the environmental protection differs from country to country.

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The prospects of BRI infrastructure and its impact on economic development could be devastating for ecosystems and environmental concerns.

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It is important to lower the cost of financing green projects. Building into finances the issue of risks related to carbon only increase costs. It would be advisable to devise a common strategic environmental appraisal across all aspects, whether it's ocean, land or other so that project financiers can work within a set of guidelines.

Erik Solheim reconvened the meeting, introducing **Zhang Yaping**, CCICED member, vice president of a Leading Party Group and member of the Chinese Academy of Sciences. He made the following comments:

For the BRI to take into account not only to economic growth but also to environment and sustainability, it is essential to access technological support and international cooperation. The Chinese Academy of Sciences has been involved in the implementation of the BRI. CAS organized an international seminar on technical innovation along the BRI. Research representatives from 22 countries and some 300 scientists took part.

There are three areas of consensus on the BRI. First, strengthening cooperation among countries is conducive to development. Secondly, we will put in place an alliance for technological cooperation and establish a long-term cooperation mechanism. Thirdly, CAS will help meet the challenges in science and technology by accessing international research programs.

Lidewijde Ongering, CCICED member and secretary-general, Ministry of Infrastructure and Environment of the Netherlands made the following remarks:

The BRI is a unique transnational opportunity and a potential game changer with impacts in critical sectors such as infrastructure, energy, engineering and logistics. Modern and well-functioning infrastructure is fundamental for the development sophisticated market economies.

Some studies have estimated that an increase in government spending of 1 percent of its GDP on infrastructure could result in a multiplier effect as high as two-and-half – for creating jobs and growing GDP. The Netherlands has a thriving economy, in part due to its excellent railroad and water networks; the logistics sector contributes more than 10 percent to the national economy.

Nations should work with China to ensure the BRI investments bring desired results: sustainable, low-carbon economic growth for all people, and growth within the boundaries of

our natural ecosystem. By 2050, international trade will grow by 350 percent. The transport volumes resulting from this economic boost will be enormous, and so will be the growth of CO₂ emissions if things do not change.

The Netherlands has 25 years of experience with the strategic environmental impact assessment instrument – a powerful method to assess the practical impacts and effects of investments in infrastructure, and that facilitates a dialogue between different interest groups in the planning phase, including different layers of government, sectors, and other stakeholders, such as NGOs.

Zhou Guomei, deputy director-general of the China-ASEAN Environment Cooperation Center, spoke next. Here is a summary of her comments:

The development of the BRI has prioritized environmental protection, and there is great potential for green development in the BRI. BRI countries all have lower than world average levels of per capita GDP, urbanization, per capita carbon emission, and consumption level of renewables. At the same time, the region also shows the greatest momentum in terms of economic growth.

In order to turn such potential into reality, three factors must be considered: guidance from policies; innovation; and commitment to green business opportunities.

There is a favourable policy environment for building a green BRI. There is tremendous development potential for business, and opportunities to foster regional environmental industries.

Marco Lambertini, CCICED member and director general of World Wild Fund for Nature, made the following comments:

WWF is excited about the BRI as an opportunity to embrace a new way of cooperation in alignment with environmental protection. This is a big test for the implementation of the ecological civilization concept at the international level.

The challenge rests with the multitude of stakeholders and countries in the region. There is also an implicit risk with the BRI because the region is environmentally sensitive and already, in many cases, under severe stress.

WWF is present in more than 40 countries of the BRI, and finds the project is generating excitement as well as anxiety, particularly at the local NGO and community levels. This is because past experience with infrastructure investment has not been positive. The BRI offers to demonstrate different approaches.

WWF welcomes the initiative of a data platform co-managed between UN Environment and the Chinese government. There needs to be wide consultation, to open up the collection of data from stakeholders and sources. Too often the environment is an afterthought, and that comes

increasingly as a cost for investors and companies, because social unrest, protest, and opposition at a late stage of the planning or even during the execution can prove costly.

WWF has too often seen, in spite of existing spatial plans and management mechanisms, protected areas being downsized or annulled to allow development to happen. For WWF, it is important to set clear targets and metrics to measure the positive impacts that the BRI investment will have, at the local level, on low-carbon development, pollution containment, protected or sensitive areas, conservation and endangered species conservation.

Ismo Tiainen, CCICED special advisor and a director with Finlandia Ministry of the Environment, made the following points:

In Finland, we have a two-pronged approach; one is political leadership, and the other is to encourage society. The government adopted an implementation plan for SDGs which was prepared in cooperation with different stakeholders. This plan generated a good discussion in Parliament. To monitor the plan, we have built an active participatory online follow-up tool. It involves roughly 40 indicators, provides explanations, and anyone can comment, ask questions and make proposals.

We engage society through a committee led by our Prime Minister. There is also a societal commitment with a long-term framework and a tool for companies, organizations, Ministries and individuals to make their own commitments. Those who commit have to report and provide updates. It's popular, and the business sector has been eager to take part.

General debate and comments

The BRI extends to the Central Asian Silk Road, and we know there are diverse positions on the use of the region's water and other shared resources. It's important to foster cooperation at a regional level. The BRI could help solve some of these long-standing issues, but carefully understanding and accepting differences within each country is key. Lately, Central Asia is trying to come together on bigger problems, like big dams, and the BRI could be a good incentive for proper infrastructure investment through effective dialogue between countries and people.

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One of the challenges now is that in many countries along the Belt and Road, there is a lack of basic data on the resources and biodiversity, which makes scientific planning difficult. Concerned countries, along with banks and financial institutions, should pay more attention to evidence and support the research and collection of basic data and information.

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Sustainable trade is completely, totally ignored, so far. Therefore, my suggestion is to promote the SDGs through the auspices of sustainable trade.

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Let's harness the fantastic potential of the BRI through the global coalition for green development. Let's build a data platform and make sure it's consultative. Let's look into the need for guidelines, and then, of course, follow best planning practices.

Sometimes you don't need to go far away to see good planning. In southern China, Shenzhen is one of the greenest cities in the world. Going farther south to Singapore, you will find they have started to integrate green concepts at a very early stage. Concerned people thought, 'You need to be as rich as Germany before you start thinking about the environment.' But Singapore started integrating the environment into its development plans at a time when it was very poor. The BRI presents a huge opportunity for development and environment, as one fully integrated process.

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China is in a period of transformation from a coal-based economy to a much more broad-based economy, with a huge focus on wind, solar and hydroelectric power, as well as nuclear. It is important to keep the same perspective in directing investments in the BRI, to ensure we are not locking nations into the old coal-based economy, but to the contrary, assist them in rapid development of solar and wind.

4. AGM Opening and Working Plenary Meeting

CCICED executive vice chairperson **Li Ganjie** chaired the plenary sessions. He introduced **Catherine McKenna**, CCICED executive vice chairperson and Canada's Minister of Environment and Climate Change. He then introduced and welcomed China's Vice Premier of the State Council and CCICED Chairperson, **Zhang Gaoli**.

a. Remarks by Catherine McKenna, CCICED International Executive Vice Chairperson and Minister of Environment and Climate Change, Canada

The CCICED is a model for international cooperation, and it has a unique place within the Chinese system, which has enabled its continued success over its 25-year history. The discussions and policy innovations emerging from the CCICED have contributed significantly to China's environment and development history. This year, we saw business better integrated into the AGM program. CCICED has a legacy of producing cutting-edge research and pushing policy boundaries; it continues to serve as the most prominent international forum to discuss the path for China's sustainable economic development.

This year's AGM has been rich with timely and purposeful discussions on progressive and practical issues. For example, comments about integrating traditional technologies, such as the textile industry, into our conversations about economic transitions, was an important reminder about the full range of stakeholders, in particular workers and families. Critical questions have been raised about challenges in restructuring China's economy, and its potential and far-reaching global implications.

China has made incredible progress on the environmental front. In my meeting with Minister Li Ganjie yesterday, I was impressed with the actions China has undertaken and the progress

made. President Xi Jinping said that “green mountains and clear water are equal to mountains of gold and silver.” Establishing a sustainable development trajectory – with the integration of clean technology, green building, and renewable energy – is within sight.

China’s actions at home, by its sheer size and economic scale, make it a global leader abroad. Other countries see what is happening here and seek to emulate its success. If China can take on some of these difficult and fundamental environmental challenges, it inspires other countries to do so.

When developing and implementing policy, there are always some key questions that require further thinking: How are current national policies going to be translated into effective measures and practical actions to address environmental challenges? How do we increase public engagement and participation? How do we effectively integrate private sector forces, innovation and clean technology into public policy? What roles do we all play, as global thought-leaders on environment and development, to effect this change?

Mr. Vice Premier, this AGM will deliver to you a solid set of recommendations to take back to the State Council. We have five recommendations to put forth:

1. Development of a 15-year “War on Pollution” strategy;
2. Integration of a full range of demographic and social considerations; and enhancement of public participation, including ethnic minorities, women, business and youth;
3. Linkage of cities and countryside in a comprehensive process for green development;
4. Development of a high-profile national campaign on sustainable production and consumption innovation, with the promotion of clean technology and renewable energy;
5. Strengthening regional and global green governance, with focus on the Belt and Road, Sustainable Development Goals, climate change and the Paris Agreement, and oceans.

The Chinese dream of rejuvenating the nation is real. Those apps for your phone, which show you in real-time the air quality where you are standing, are remarkable. This kind of public awareness leads to better education and ultimately better choices. But national guidance is needed. Individuals, institutions and communities need to understand better how they will benefit from a green transition and an ecological civilization.

China could develop a high-profile national campaign on Sustainable Production and Consumption Innovation for China’s Ecological Civilization. With greater public understanding and awareness, stronger political commitment will grow. Another key aspect is engaging Chinese businesses to accelerate clean growth. Business has a role in giving people more choice in green consumer products, services and lifestyles. Greater investment in science and technology – including in renewable energy, smart power grids, electric vehicles, and green building – would all lead to better and cleaner development choices.

Climate change is the issue of our times. It is critical that the global community continues to focus its efforts on implementation of the Paris Agreement. China's significant international influence must be used to strengthen global green governance. China's engagement through South-South cooperation and the new Belt and Road must lead to a way of life and work that is green, low-carbon, circular and sustainable.

The onus is on all of us in this room to take ownership of the excellent ideas heard over the past three days, to amplify the messages and continue to take bold steps in our own countries, organizations, and businesses. This is the first year of the CCICED's sixth phase, and the opportunities are tremendous.

b. Remarks by Erik Solheim, CCICED Vice Chairperson, Executive Director of UN Environment

Erik Solheim, CCECED vice chairperson, made the following remarks:

The clear skies enjoyed during this CCICED AGM show China's progress on this front. It follows the 19th Party Congress, when new slogans such as 'Green is the New Gold,' 'Beautiful China,' 'Ecological Civilization' have been reiterated. This can inspire the rest of the world. The bike-sharing revolution is taking off in China and spreading like wildfire to the rest of the world.

Last week, China played a key role in the UN environmental assembly in Nairobi, where it was determined the priority is fighting ocean plastics. Plastics in our oceans cause enormous danger to animals and is an enormous issue for humans because microplastics are ingested when people eat fish. Every nation in the world at the conference wants a plastic-free planet, one where there is no air pollution. Another priority is ensuring that the BRI, which is the biggest investment project of this era, is green.

c. Keynote Address by Zhang Gaoli, CCICED Chairperson and Vice Premier of the State Council

I would also like to thank all of the experts, scholars and friends for their insightful comments; the Chinese government will seriously consider all suggestions and recommendations.

President Xi Jinping has emphasized that China must adhere to the fundamental principles of resource conservation and environmental protection, cherish the environment as we cherish our own life and adopt a holistic approach with the most stringent rules. Green development modes and a green lifestyle must be pursued.

The past five years have seen unprecedented achievements in ecological civilization and environmental protection. The environment is obviously changing for the better and is one of the pillars in our master plan that calls for groundbreaking, forward-looking and pioneering work towards better results.

While much has been done, China faces many challenges. The philosophy of green development is taking root with improved awareness of the harmony between man and nature. Enterprises are better at complying with the law, NGOs and the public are getting more conscious and motivated in environmental protection and monitor the government's environmental management.

China is a big country, and consensus is essential to environmental governance. Last year, China eliminated 65-million tons of excessive capacity in its domestic steel production. Government also shut down 50-million kilowatts of power generation capacity. Total coal consumption has dropped; China's energy mix is dominated by coal, which is why it is important to restructure this. Reliance on coal for energy has dropped from 67.4 percent in 2013 to 62 percent in 2016. Clean energy, such as hydropower, has increased to a share of 19.7 percent from 15.5 percent – equivalent to a reduction of 240-million tons of coal. There are more than a million new energy vehicles in circulation in China, representing half of the world's total. There are also a number of integrated projects to improve the environment in 126,000 villages, benefitting 190-million people in rural areas.

Efforts have been made in ecological restoration and protection for ecological security, and now there are 2,075 nature reserves covering 14.9 percent of the territory. Eighty-five percent of the world's animal population, 65 percent of the high plants have been effectively protected, and the number of protected wetlands has increased from 553 five years ago to 602. The forest coverage has increased from 16.6 percent earlier this century to 22 percent in 2016. The land impacted by desertification has shrunk by 1,980-square kilometers. Every year, China has among the fastest growth of forested areas in the world.

China is also stepping up its efforts in institutional reform. A target-oriented performance review and accountability for ecological damage are two of the more than 40 reforms that have already been implemented. We are also ensuring greater coordination among the 'river and lake chiefs,' which requires cooperation among various levels of government and regions.

We have done a lot in order to improve facilities such as ports and roads in more than ten provinces and cities around the Yangtze River. To protect the river, we have instituted environmental inspections, headed by top-level officials. Whenever problems are identified, solutions are presented. As a result, a lot of longstanding problems are abating.

China is among the first countries to publish the INCDs, implement 2030 SDGs; we are phasing out ozone-depleting substances, which amounts to 50 percent of the total for developing countries, making the most sizeable contribution to protect the ozone layer. China has also been facilitating international cooperation to address climate change, contributing to the signing of the Paris Agreement and implementing a national plan on climate change.

China unswervingly supports the implementation of the Paris Agreement. In 2016, at the second UN environmental assembly we produced a report called "Green is Gold: The Strategies and Actions of China's Ecological Civilization," which highlights China as a staunch supporter and practitioner of global sustainable development.

The 19th CPC congress has made new strategic commitments that require us to win the war against pollution. There are three important battles. The first is against economic risks: China's economy is aligned with the world economy, which is evolving in an uncertain way. The second is against poverty since there are still 43-million people living in dire poverty, especially in the remote areas. The third is against pollution, where China faces daunting challenges. We admit China is well behind developed countries in energy conservation and environmental protection. We need to learn from international experience.

China is committed to green development which will see the emergence of a green, low-carbon circular civilization, incorporating economic and social development. Energy production and consumption will be revolutionized to establish clean, low-carbon, safe and efficient systems. Measures will be implemented save energy. China is both an important producer and consumer of energy. An optimized energy mix is critical to ensuring blue skies in Beijing.

As we are decommissioning factories and plants, new industries are emerging, which inject new momentum into the economy. New technologies and industries will lead to innovations. Government will mobilize resources to solve serious environmental problems, implementing action plans to treat and control the pollution of air, water and soil.

China will step up its efforts in solar by categorizing farmland and managing access with stricter use and permits. China is also concerned with oceans plastics. China will make all efforts to protect oceans, grassland, wetlands, mountains, rivers and forests.

In newly developed areas, some programs are underway. Trees have been planted to attract more birds. To protect the forest, we have implemented new measures at different levels. Long-term planning is vital to future development. A supervision authority will be put in place to manage natural resources and ecology based on several factors, including a role for markets.

CCICED is a platform for communication, consultation, coordination and innovation. The Council's suggestions and recommendations are treated very seriously by the Chinese government. Consensus, mutual understanding and communication can bring the world closer than ever, which will promote future development. CCICED has a role as a torchbearer for a beautiful world.

d. Briefing on the Environment and Development Open Forums

Chair **Zhao Yingmin**, secretary general of CCICED, called the assembly to order. CCICED member **Hideki Minamikawa** briefed members on the open forum discussion on Green Urbanization and Environmental Quality:

Environmental problems are becoming much more serious with issues including energy, water shortages, transportation, housing, air pollution, emissions and waste.

The main forum discussion points involved pollution and environmental quality – how to avoid risks and promote green living. We discussed valuable insights on best practices and solutions in addressing problems in cities. The issues require more government coordination

with specific consideration of the affected people; capacity building, communication and education are also required for promoting green urbanization.

It was suggested that we examine standards, indices and indicators to assist and compare cities of the world so that we can understand the current situation and movement in cities.

CCICED member **Jan-Gunnar Winther** briefed the plenary on the open forum discussion on Global Ocean Governance and Eco-Civilization:

The management of oceans is fundamentally different than management of land, because of the connectivity of oceans.

There are three key messages that emerged from the forum. The first is scientific knowledge, which must guide all ocean governance and management. Second is acknowledging that an ocean council has already been established in China. It should also be noted that increasingly complex issues related to the ocean convey the need for having strong coordination between sectors.

Lastly, turning to the BRI, China is well placed to influence other countries when it comes to global ocean health. Ecosystem-based management of the ocean could be an important tool for China to green the BRI.

CCICED member **Stephen Groff** briefed the plenary on the open forum Yangtze River Protection and Innovative River Basin Governance:

The Yangtze River is of critical importance for achieving ecological civilization. It is the longest and largest river in China and the third largest in the world, providing water to almost 600-million people. It is rich in biodiversity and contributes a third of the country's resources.

The Master Plan for the river provides a good framework for protecting the river system, but the reality is that compared to other key initiatives of the government of China, the river initiative has lagged behind.

We identified several key issues that would require extra study: institutional, legal and governance reforms, economic incentives, green finance mechanisms and a recommendation to establish a Yangtze River task force.

CCICED member **Marjorie Yang** briefed the plenary on the open forum Business Roundtable on Innovation and Green Development:

Participants included representatives from business, energy, agriculture and environmental protection sectors. Practice shows that in green development, it is not just the corporate responsibility of companies to become competitive, but also innovative. Green development can be a driver instead of a burden.

While we encourage new economies, we shouldn't ignore the impact traditional economies can generate. To solve systemic problems requires cooperation; government should come up with

policies to analyze behaviours. Enterprises are major forces for innovation, but government policy is also essential, along with the engagement of the general public and consumer-driven processes.

CCICED member **Andrew Steer** briefed the plenary on the open forum Green Development Transformation in China and the World:

Our question considered during the session was how can we implement this historic transition towards an ecological civilization and the green economy? Economy and lifestyles were discussed.

Several clear themes and questions emerged, among them the suggestion that a long-term vision and narrative are required; what is the kind of economy, society and planet that we want? And what would it look like over the longer term?

The long-term vision has to speak to the heart as well as the head. It's important to ask what development is really about? While vision and inspiration are essential, they are not enough. There is a need for disciplined policy implementation and innovation. We discussed the type of instruments that are required to achieve green development.

Consumers can help drive the economic structures that are required. Around the world, there is now growing expertise around how to change human behaviour through means such as education, moral appeals and economic nudges. A persistent approach to change is required; it's a marathon, not a sprint.

CCICED member **Eric Heitz** briefed the plenary on the open forum Clean Energy and Climate Change:

They were over 20 presenters at this session, among them seven negotiators from the Paris Agreement. All agreed that climate change is one of the biggest challenges we face. We also know that clean energy is one of the challenges, but not the only one.

Despite the intended withdrawal of the US, the majority of countries are united to address this challenge. The Paris Agreement is a move in the right direction, however, the evidence does not put us on a trajectory to achieve the Paris goals. Meeting the goals would require a further transformation of the economic systems.

The question is how do you make low-carbon prosperity the mainstream economic path for China, and, by example, for the world? Our main finding is that China now needs more integration with economic policy, including a green financing system. With regard to policy recommendations, China should use a 2050 pathway framework to understand the coming transformation. China should also continue its strong sector policies and add a more high-level integrated policy, which have helped the solar and wind areas among others. This will drive new investments, create jobs and accelerate change.

To drive massive investment, China needs to create a green finance system, which means you require many tools, such as bonds, funds, insurance, and others. Another suggestion is to create a fair marketplace; China should phase out the supplement of coal and increase the rate of tax on fossil fuels. China needs to build a stronger ecological narrative that match its strong actions and policies.

CCICED member **Marco Lambertini** briefed the plenary on the open forum Greening Belt and Road Initiative and the United Nations SDGs.

Most recognize that the greening BRI is not an easy task and historically these types of projects haven't had a great track record. The BRI is a collection of important projects, and its greening will be as good as the project it supports. Key recommendations are in the planning phase; use the best available data and review it early – even before the planning cycle. Initiatives should build on and change existing environmental regulations.

Another recommendation is to take a strategic approach to planning. The BRI is a complex initiative that involves several players with multiple layers to ensure greening. Many thought that China's leadership would be critical on this initiative. We need clear principles to guide the BRI. This is an ambitious journey that provides immense opportunity to redefine green investment in infrastructure.

e. Draft Policy Recommendations

CCICED International chief advisor **Arthur Hanson** briefed members on the draft policy recommendations:

A key objective of having the open forums is that the Council is in a learning mode for Phase VI, so even if ideas don't make their way into a document, they will be useful in future work. One of the important matters is the idea of how to make concepts straightforward? The recommendations have to become a pointed document. We talked about the six pillars, which is an umbrella around which the more specific recommendations appear.

One important aspect is the need for a longer-term look at the war on pollution and to recognize that this is something that will go on for some time. We need to extend this notion of a war on pollution to the ocean. Public participation also should be woven throughout the whole set of recommendations.

One of the recommendations considers what constitutes an eco-reform process, which is essential for the green development of an ecological civilization and linking cities and the countryside. The concept of integrated approaches keeps coming up as an important concept.

A recommendation is to create a high-profile national campaign on sustainable production and consumption innovation for China's ecological civilization. The word 'lifestyle' was discussed, and this concept of a green lifestyle has a place in the recommendations.

Another idea that keeps coming up in our discussions here, which I'd never heard before at CCICED, is this interesting word 'nudging.' It's a different way of changing behaviour. So, there are many interesting points, including global governance in relation to the new phase of work, to consider. These are ideas which are important in terms of the new work plan as well as providing some substance for the recommendations.

China's chief advisor **Liu Shijin** made the following additional comments related to the draft policy recommendations:

Green development or ecological civilization is not a burden, but rather it is an engine, a driver. Further study of the green concept should be considered as a system, and we would like to produce an important theoretical study on green development as a concept.

There should be more emphasis on innovation. The world is in the process of transformation from the conventional industries to modern industries, and we should crystallize the essence of the traditional industries and pass it on to modern industries. Innovation improves efficiency, and it is also green. We need more cases of green development and innovation and better narratives on greening development.

Many have expressed an appreciation for the Chinese economic growth benefits as well as successes on pollution control. In the future, more will be done. With this in mind, China should have the will and desire to learn from others. International experience, including approaches, methods, institutional arrangements and pricing, is valuable.

CCICED vice chairperson **Achim Steiner** chaired the session on the comments and discussion related to the draft policy recommendations.

General debate

New research shows that a dietary shift would provide many eco-benefits. It could reduce stress on soil and biodiversity, but perhaps most importantly for developed and developing countries alike, diet changes could help reduce the growing public health bill associated with diabetes, obesity and antimicrobial resistance. The Council could make a huge contribution by looking at sustainable food systems.

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Ecological civilization is not only a gift to Chinese citizens but an exportable one. How wonderful if we could use the BRI to promote that holistic approach. Most of us think of the BRI as an infrastructure project, but the whole concept of a belt and a road is that they convey things – commodities, exports, money and people.

We need to broaden our understanding of the greening of the Belt and Road, and in particular commodity flow is going to be important. While China tries to ensure the goods sent are safe, this is difficult stuff. It seems a very legitimate area for CCICED to discuss.

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Achim Steiner invited council members to offer thoughts on the policy research areas for Phase VI. He made the following remarks before opening it to the floor:

The Council's process is an organic one regarding next steps. It's not a decision-making body but rather is constituted to provide advice, bring global thinking into the discussion about major policy areas in China.

Members are encouraged not to underestimate the influence that is collectively exercised through the Council. It may not always mean immediate results, but it is still worth highlighting where members believe we should go deeper or issues that should be added to the agenda.

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I suggest the future not rely on carbon-based energy, but rather hydrogen-based energy. For example, if I have electricity that I produce from wind or solar, I can turn that electricity into hydrogen and oxygen by discharging that electrolysis through a water source, turning it into a new energy source. It's important for us to try to understand the world in 2050 and to meet the important objectives as stated here. We need to think how science and technology are going to improve our understanding of options to meet the goals that we have set.

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Given the singular and extraordinary significance of the BRI, I am wondering if the Council, as a research project, might undertake a set of case studies in partnership with researchers from a select number of involved countries to determine the fullest expression of green design.

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Since the 19th Party Congress, much has been heard about the approach of letting nature heal itself – ecological restoration. That is a really important element that comes through in many different ways, but there is a big challenge there as well.

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f. AGM Concluding Session

With **Li Ganjie**, CCICED executive vice chairperson acting as chair, vice chairperson **Vidar Helgesen** was introduced and made the following remarks:

It is impressive to see how the Chinese government is inviting the Council to debate its challenges and provide advice, especially in the context of globally rising nationalism, isolationism and distrust of foreigners. Leaders have emphasized that China will become more and more open to the world. China is bringing a needed approach to the world's land systems, forest practices, oceans and waterways, and to safeguarding biodiversity.

At the same time, because these are shared global problems, our only hope is working in concert. The Council's recommendations to China's State Council will help China exercise global leadership in environmental governance.

Vice chair **Erik Solheim** made the following comments:

The fact that the AGM took place six weeks after the Party Congress, where such clear direction on the environment was given, made this meeting even more significant. The AGM is happening at a time when there is a huge shift in Chinese engagement with the world and a shift in the China Council. The role of China taking suggestions from others has now shifted, and China can now lead by providing an example to the world.

If China can drastically reduce its air pollution, there is no reason other parts of the world can't reach similar targets. China has economic advantages, but other parts of the world can still benefit. It may not be replicated around the globe but looking into similar solutions and lessons could be replicated.

Council vice chairperson **Zhou Shengxian** spoke next. Here is a summary of his comments:

For a long time, the environment was neglected. China overlooked environmental protection; now there are slogans translated into solutions. Most people outside of China don't understand the concept of ecological civilization.

Thanks to CCICED and government officials, we have been presented several new suggestions. The aim is to develop CCICED into a two-way communication platform of cooperation and collaboration and make the best use of members' expertise and resources.

Vice chairperson **Achim Steiner** closed the meeting on behalf of executive vice chairperson **Catherine McKenna**. Here is a summary of his remarks:

Several areas are emerging for Phase VI. The first one is the elaboration of the new paradigm of ecological civilization. We have to take the notion of ecological civilization in development into a number of actionable, measurable parameters that also allow us to define pathways that are helpful to China.

The second major area is to help to inform this new dynamic between China and the world. Ecological civilization is something that China is articulating for itself, but very quickly, the concept will be refined. Then it is up to the world whether it wishes to work with China.

The SDGs will be a good reference point because in 2016 they were a reflection of an emerging development paradigm. This is also related to the BRI, which meets with skepticism in some parts of the world. The China Council is one forum that can help ease the concerns and give rise to a conversation on the greening of the Belt and Road.

Phase VI must truly live up to the systemic-thinking approach. We are talking about how system designs can enable climate transitions to happen. The trade and investment part of this

Phase VI builds on this. The 19th Party Congress has conveyed that China is trying to initiate a systems change. The Council is in a prominent position at an important time.

Vice chairperson **Li Ganjie** concluded the AGM and thanked speakers for their comments and participants who contributed their time and expertise to the Council.

III. 2017 CCICED Policy Recommendations

1. Ecological Civilization in Action for a New Era

Since its inception in 1992, the China Council for International Cooperation on Environment and Development (CCICED) has provided the State Council with policy recommendations each year. We have appreciated the attention given to these recommendations, and now, in this first year of Phase VI (2017-2021), we are honored to continue this productive working relationship.

Members welcome the environment and development outcomes of the recent 19th CPC Congress. Clearly China will place major emphasis on ecological civilization. The shift to a 2020-2050 green pathway is very important to meet human and ecological needs, including planetary life support systems. The future will not be clean and green without the active and full participation of businesses, governments and the general public. By securing full public participation, the new 2050 pathway of a Beautiful China will speak to our hearts as well as our heads.

CCICED members support the efforts of China in its War on Pollution, environmental protection and management, and the mainstreaming of environment into the economy, for example in the efforts for a national carbon trading system and green taxation policies that we hope will be well underway next year. We support the 19th CPC Congress focus on technological and management innovation, and also on considerable attention to improved rule of law and green governance. CCICED Phase V recommendations on institutional reform, transparency and public participation, environmental rule of law improvement, and green finance remain highly relevant.

Also, welcome is China's enhanced role in supporting and sometimes leading global environmental governance improvements, including commitment to the Paris climate change agreement, UN 2030 Sustainable Development Goals (UN SDG2030), greening of the Belt and Road Initiative (BRI) and South-South Cooperation. CCICED Members also believe that it is timely for China to take a stronger role in global ocean sustainability and to help make oceans free of plastics and other pollutants; and to accelerate efforts under the Global Convention on Biological Diversity (CBD), including topics such as invasive species; and to stem global desertification.

China's voice and experiences in building an Ecological Civilization can be very powerful and inspirational for other countries. Such efforts could be further enhanced by advocacy and communication efforts that CCICED will be glad to support. Domestically, it is important to build a strong linkage between SDGs and China's five-year plans and to use the SDGs as a framework and basis for improving government policies and the efforts of business and communities.

China has made significant progress over the first two years of the 13th Five-Year Plan; but there is an urgent need to speed up environment and development reforms during the remaining years of this Plan. Creating a moderately well-off society by 2020 must include considerable improvement in environmental conditions. By accelerating Ecological Civilization action now, positive outcomes during the following two or three Five Year Plans stand a better chance of being achieved.

2. Six Pillars for a Green Transition in the New Era

China's vision of a community with a shared future for mankind suggests a desire to find win-win solutions for problems nationally, regionally, and globally. Achieving domestic environmental goals will help China become a global leader in green development and secure the fulfillment of SDG2030 goals. The greatest opportunity of the 21st Century is the transition to green development. China can serve as a green beacon of hope for many others, if it is successful.

That China is setting New Era goals including pivot points of 2020, 2035 and 2050 is a significant step forward. But to secure a nationally and globally safe approach, development must remain within ecological planetary boundaries such as those for biodiversity, geochemical cycles, and climate change—tasks that will extend to 2100 and beyond. We must keep such long-term visions and aspirations in focus, while ensuring they influence today's decisions. Abstract concepts of ecological civilization and green development must become more actionable through innovative thinking, green education, and pilots followed by scaled up efforts. The following six policy pillars are suggested for a long-term, overarching approach to China's green transition.

Pillar 1: Establish new green development narratives for 2020 to 2050.

Build a consistent and coherent set of environment and sustainable development policy objectives from now to 2050 and identify the main policy and institutional reforms supporting implementation. Stringent environmental policies and green development can be fully implemented only after there is a broad understanding that green development is not a burden but a driver for better lives and livelihoods. Let all levels of government and people throughout China truly understand differences between green development based on ecological civilization compared to other development models.

Pillar 2: Ensure a level playing field for green industries and other green development.

Create conditions for fair competition and provide appropriate incentives (e.g., payment for environmental services, subsidies, green tax reform). Efforts may include: innovative and cost effective methods to internalize environmental costs of products and processes; reassessment of subsidy and support policies for fossil energy, chemical industry, and chemical agriculture; full implementation of recommendations from the G20 report on green finance; strengthened incentives to shift from end-of-pipe towards treating pollution at source; incentives for green industries and green products; implementation of a more aggressive environmental

enforcement and compliance system in a fair and consistent manner across China's regions following rule of law principles; and consideration of how public support for both green and traditional industries (in terms of funding, R&D, talent development, infrastructure, and green government procurement) can best enhance their economic efficiency and environmental performance. Strict liability for environmental impacts is the greatest driver of the green economy and a multi-stakeholder approach engaging with the private sector and the public is needed.

Pillar 3: Introduce pro-green incentive mechanisms and conduct pilot projects.

Carry out systemic reform to overcome the inconsistencies among the many institutions and three policies regarding green development. Many policies can be piloted in an all-round way on a small scale. Promote new development performance measurement based on standards of a better life, natural capital assessment, performance assessment of local officials, land management, taxation and finance.

Pillar 4: Build a digital green economy for the future through a new green stimulus plan.

Boost the confidence in green development by issuing a number of major landmark policies to accelerate development of green industries. Implement a new stimulus plan for green investment. Different from the conventional plans of investment in infrastructure, the new stimulus plan or plans should focus on investment in next-generation digital infrastructure, new eco-environment, culture, and other non-conventional green infrastructure intended to create demand for green goods and services; stimulate demand for green services by adjusting work arrangements and improving career flexibility; assess development objectives in areas such as new energy, electric vehicle, thermal power plants and green building, and explore the feasibility of conducting small-scale pilots to promote green transition with more bold approaches. Target adjustments of green development policies to include ecological function zones.

Pillar 5: Build a more inclusive society and resilient economy.

Provide assistance to specific groups, sectors, and regions that are adversely impacted by the green transition and establish corresponding comprehensive risk management systems. A green transition should not be perceived as threatening or dangerous. Thus—establish a unified national unemployment insurance system; provide special assistance and capacity building through education and training to assist workers affected by the shutdown of excess capacity and zombie enterprises; establish special transfer payments to help regions (especially counties) where the revenue is largely sourced from high-pollution enterprises in order to reduce their dependence on such sources; pay greater attention to the substantial overlap between impoverished areas and main functional zones, with promulgation of appropriate tailored measures; and develop integrated risk prevention and control mechanisms in order to improve economic resilience.

Pillar 6: Promote strengthening of the global green governance system. Formulate new narratives of global green development based on ecological civilization thought. Foster development of green governance systems and incentive mechanisms at the international level to promote green development in all countries. Facilitate climate change negotiation to shift from “burden sharing” to “opportunity sharing” and from “zero-sum” competition to “win-win” situations; incorporate green standards and objectives into appropriate international protocols for investment, trade and finance, as well as into other international mechanisms such as G20; establish a global knowledge center for green development under the framework of South-South Cooperation, BRI and BRICS+, to foster green transition in other developing countries. Implement strict environmental, social, and governance standards in strategies such as Belt and Road Initiative, South-South cooperation, and China’s overseas investment. If China can successfully explore a new path towards green development, it will be a major contribution to common destiny and the modernization of low-income countries.

3. Five Specific Recommendations

Recommendation 1: Create a Fifteen-Year Strategy for War on Pollution Action Plans

For the 15 years ahead there should be a longer-term and integrated effort focused on cost-effectiveness, synergies, and ways to build public confidence about eventual results from the War on Pollution. Long-term risk reduction and management is required, with avoidance of technology and infrastructure lock-in. Clean coal and synthetic natural gas for power generation should be transient technologies, bridging from old to new during China’s green transition. Large-scale deployment of ‘clean coal’ needs an exit plan and an exit budget to protect China from being locked into a path of prolonged fossil fuel use. Green adaptive planning should be part of the strategy.

While the Air Action Plan is the first to come up for renewal, it would be helpful to develop an overall plan that incorporates all three categories, plus one other—marine pollution. Ideally, an integrated rollout should be ready by 2020 with targets up to 2035, the pivot point when China expects to be a “basic modern country”. The new strategy should focus on innovation, for example, regulating plastic materials production and disposal at source in order to reduce the burden of such waste entering rivers and the sea.

Through co-benefits, China’s pollution reduction plans can contribute to a steady transition for meeting the Paris targets of staying within a global 1.5 or 2.0C increase. Action on black carbon sources will also reduce PM2.5 pollution and reduce ozone pollution. Action on methane emissions will become very important. Monitoring of co-benefit results is essential, especially for multi-pollutant, multi-region and multi-sectoral coordination locations. Prime cases are the Yangtze River Economic Belt, the Hebei-Beijing-Tianjin region as well as the international Belt and Road initiative. Capacity building is a key concern to address complex integrated pollution control.

Recommendation 2: Fully Incorporate Demographic, Cultural, Social and Public Participation Aspects into China’s Ecological Civilization Action Plans

Considerable attention has been given to environment-economy relationships in China. In the longer-term, social-environmental linkages may be among the most significant. This is the case for environmental related social unrest ('Not in My Back Yard'), management of nature protected areas, ecological redlining, climate adaptation, urban migration, and relationships of poverty reduction and the environment. Demographic changes such as an aging population will influence environmental health impacts including mortality from pollution. Specific cultures bring forward their particular approaches to local resource management and stewardship. Full public participation in environmental decision-making is still lagging in China and in many partner countries. And all citizens require full access to the courts to protect their environmental rights. The intersection of eco-environmental protection with improved health, education, and access to rural and urban opportunities has unexplored possibilities. Over time, and with balanced economic and social reform, new sustainable livelihoods and improved living conditions will be created. Four components are highlighted below.

First is to act on environmental health issues more effectively. The War on Pollution needs specific targets to reduce health impacts from all major pollution sources. More efforts should be made to fully understand the linkages between environment and health, and results made readily available to the public. Environmental risk assessments need to be made part of standard procedures for both workplace safety and for encouraging green transitions in many industrial processes. Also, transparency in environmental knowledge sharing can be used as a tool for avoiding local overreaction to some environmental incidents and for important planning decisions at all levels.

Second is the need to create more long-term livelihoods based on ecological construction (and restoration), especially for people in more remote parts of the countryside. The permanent nature of such employment needs to be guaranteed, including reform to existing eco-compensation programs. Cultural and gender specific experience can open new opportunities.

Third is to build Ecological Civilization co-management systems to improve ecological and other services in nature reserves, parks, ecological redline areas, and in other public lands that sometimes are considered to be of low value. Class 4 and 5 river zones and some contaminated lakes and coastal areas are important candidates for this type of management. Initiatives, when located in Autonomous Regions populated by minority cultures, should draw upon the skills and knowledge of local people. Forming a national Ecological Conservation Corps might be considered for improving contaminated soils, greening deserts, and creating ecosystem-based carbon sinks.

Fourth is to provide more opportunities for public participation in assessment of projects, voluntary efforts for improving ecological services in the countryside and cities, for wildlife conservation, etc. Multi-stakeholder involvement in decision-making processes and community-based conservation activities should be encouraged.

As China's green transitions take hold there will be innumerable opportunities for local services: to maintain good conditions including environmental monitoring, to safeguard local ecological redline spaces, and to participate in local environmental planning and law

enforcement. High biodiversity landscapes of tomorrow will become magnets for recreation and tourism, requiring trail-maintenance and many other initiatives suited to public responsibility. Protection and enhancement of ecological services is an excellent way to ensure that no man or woman is left out in the effort to eliminate poverty.

Each of these four components may be influenced by gender considerations. Providing eco-environmental and green development opportunities will reduce family splitting through migration from rural areas. Tourism, protection of ecological services, and preservation of traditional culture should give opportunities to women and men in villages and towns. Gender-related aspects of climate change, whether risk of natural disasters, or climate adaptation initiatives require attention. Women and children exposed to toxic environmental situations are vulnerable.

Recommendation 3: Build a Comprehensive Eco-Reform Process for Green Development and Ecological Civilization

Fragmentation of decision-making remains a serious problem. At a fundamental level, integrated efforts for addressing land and water use on a regional scale are necessary, including better information sharing among regulatory agencies. Definition of responsibility for preservation and restoration of ecosystems can still be improved.

The ecological redlining and integrated planning approach now being taken in the Yangtze River Economic Belt is a useful example. Today's rapid urbanization must become green urbanization, including ecologically sensitive planning with improved utilization of resources like space, soil and waste. New data collection techniques can help to document resources of the city. We have to reduce material waste and pollution and enhance recycling inside the cities. Old manufacturing towns should be reinvented with people in focus. Many urban opportunities exist for greater use of citizen environmental monitoring and science.

The connection between urban and rural development requires a greater level of eco-reform. Some reforms must be very local and satisfy the desire of local citizens seeking a better life and improved lifestyle. Demands to be met include access to green transportation, comfortable and efficient living space, improved safety and environmental health, green space such as parks and other amenities.

Smaller towns and peri-urban areas need to realize their own style of a green living environment. Ecological services must be bolstered throughout the countryside. In China and worldwide such services are under threat. There must be a dramatic reversal, so that ecological services become the prime value even for agricultural and other material-producing lands and waters.

3.1. By 2020 every city and town in China should create and manage its own green development and Ecological Civilization goals for implementation during 2020-2035.

Needed is a National Green Urbanization Dream that can be shared among communities large and small, old and new. This Dream would be to create highly livable neighborhoods and urban ecosystems with continuous improvement of environmental, social and economic conditions. The suggested period to 2035 coincides with the time of mass migration from countryside to cities that will complete the transition of China's people into 70 percent or more living as permanent urban residents. A 15-year time horizon will allow communities to act on their dreams as well as on meeting very specific short-term needs. Each urban community should create its own green development destiny, with full public participation, and with the encouragement of governments. Plans can be based in part on the large number of experiments underway, including Low Carbon Cities, Ecological Civilization pilot initiatives, and many other efforts. It is also possible for China to draw more extensively on international experience of eco-cities, green cities, green urban renewal, and many urban planning successes elsewhere. Climate change (both mitigation and adaptation) must become an important element considered in all community green development plans. Also, better biodiversity conservation actions are needed so that there is respect for the role people in the countryside play in maintaining land and water in good condition, supplying ecological services and the food and natural resources that cities require. Eco-compensation by cities to support upstream stewards of land and water should be part of urban green plans.

3.2. Make ecological services the prime value of China's rural landscapes and waters by 2035 to 2040.

The services people and communities receive from ecosystems fall into four categories: provisioning (food and fiber, natural medicines), regulating (climate, water quality and runoff, disease control), supporting (nutrient cycles, pollination), and cultural wellbeing (spiritual and recreational benefits). Value of provisioning is generally the easiest to monetize and therefore quantify, while the value of the others generally is underestimated. The danger is that food, fiber, and other material needs may continue to expand at the expense of the other functions. These long-term matters affect rural employment potential, future green agriculture opportunities, the safety of urban communities, and protection of China's rich biodiversity. China must continuously expand regulating and supporting ecosystem services to reach double or triple today's level by 2040 to 2050. Also required is a better balance among the four types of ecosystem services, and explicit recognition that all types are important to rural sustainable livelihoods.

Fostering and protecting ecosystem services should be of major concern in the spatial planning of infrastructure, along with ecologically appropriate industrial site location, especially within rural areas. As soon as possible, but no later than 2035 to 2040, the primary objective of all land and water use should be enhancement and protection of the ecological services they provide – even in important agricultural regions and in peri-urban areas.

Recommendation 4: Create a High Profile National Campaign on Sustainable Production and Consumption

Government should use all available tools to promote sustainable production and consumption. Targeted strategies should be developed and implemented on a sector-by-sector, coordinated basis by the time of the 14th FYP. This effort should take into account major needs and desires: actions that will improve happiness, health and wellbeing but with reduced ecological footprint; comfort and convenience at home, in schools, and in the workplace; plus, new green livelihood possibilities.

More attention should be given to promoting sustainable consumption at household level. Dedicated centers and programs should be established, drawing on overseas and local examples. To guide consumers, encouraging measures are just as important as pricing. The sharing economy will bring more opportunities to reduce waste, but also bring their own waste and other problems. Such problems should be tackled without delay. A good understanding of social behavior is needed to nudge consumers towards new values. In addition, there must be eco-design and resource efficiency certification standards for products. Designers and manufacturers must adopt and adhere to these. Desirable policies include removal of harmful subsidies, phase-out of harmful chemicals, increased taxation of wasteful or polluting products and services, and ensuring that environmental and health liabilities are fully factored in and paid for by polluters.

There must be radical thinking for the future of sustainable production. The basics for a 'Fourth Industrial Revolution' provide a starting point for China and other countries that have invested heavily in science and technology capacity. Consider the world of 2025-2035 when the following technologies are widespread: wind and solar power; smart electrical power grids; electric automobiles, lithium battery production; robotization; innovation in land management including remote sensing and detailed mapping for ecosystems and sensitive landscapes; organic agriculture based on environmentally friendly, water-efficient biotechnologies; traceable green supply chains so that consumers, builders and institutions can make environmentally sound choices in their purchases, especially via continued advances and applications of IT.

Innovation in management approaches within enterprises, governmental agencies and communities is essential to create the enabling circumstances for behavioral change. Some important means are: (1) green financing, tax and fiscal reform to ensure a level playing field for green products; (2) more rigorous enforcement (and independent oversight) of environmental laws, regulations and standards; (3) greater access to credible information about environmental sustainability and safety of products; (4) better technologies; (5) better skills, and (6) better infrastructure (for recycling in particular). A shared vision of sustainable supply chains is required.

Recommendation 5: Strengthen Global and Regional Green Governance

It is timely for China to play a greater role in global environmental governance. China may transfer its experience and new models of environment and development to assist other countries in their green transitions. The power of examples is strong. There is a need for a solid strategy to identify feasible choices for leadership and partnership—climate change is the most

important case. This topic, plus ocean green governance, and greening of the Belt and Road Initiative are briefly discussed below. Biodiversity protection and utilization should also be considered, especially since China will host the 2020 Biodiversity Global Convention Committee of Parties.

5.1. Climate change

Current commitments under the Paris Agreement, even if fully implemented, will be insufficient to achieve a satisfactory level of global warming mitigation. Given China's key roles as an emitter, and also as a highly engaged international partner in this global effort, new opportunities for improvements must be found. A 2050 pathway is a critical tool to address the long-term changes needed to solve the climate problem. China needs to start early to develop its own Mid-Century Climate Strategy and link it with others. Also, China's national Carbon Trading initiative could be a model for replication at an Asian regional level.

5.2. Oceans

The perilous ecological situation of the world's oceans is receiving global attention. Yet more national wealth generation is expected from the Blue Economy. Environmental and sustainable development matters are not fully covered by the existing ocean agreements, including the overarching Law of the Sea global framework. For example, the difficult matter of ocean contamination by macro and microplastics is not covered well. China should create a national strategy that will more clearly provide for green development of its Blue Economy. This strategy will need to focus attention not only to the use of China's own ocean space, but also on China's use of the high seas and waters subject to dual rights. Concurrently, China can play an important role in the ongoing implementation of global ocean governance. China can influence other countries to build a better foundation for global ocean health and blue economy by using its well-placed position and drawing on its own experience and solutions.

5.3. Belt and Road Initiative

The third suggestion for a high priority governance need is greening the BRI. China's green development approach, the UN SDG2030 goals, the Paris Climate Agreement, Biodiversity and Desertification global accords, and ecological civilization should become central features in the Belt and Road Initiative. Through the BRI, China can show ecological civilization in action, whether on land or sea. Significant institutional capacity building is needed in China as well as in BRI countries.

Also, a Belt and Road Green Governance Mechanism including information disclosure, public participation and access to arbitration, should be established. Comprehensive early stage planning that highlights environmental and social concerns should be applied in BRI projects. Early ecosystem-scale planning in collaboration with partner countries where infrastructure development will take place is essential for BRI to be green and sustainable. The same reasoning should be applied to China's overall efforts in South-South Cooperation initiative.