

*Workshop on Promoting Renewable Energy and
Sustainable Development in Myanmar*

**China's Sustainable Development and Reform for
Green and Low-carbon Transition in a New Era
新时代中国的可持续发展与绿色低碳转型**

Dr. WANG Yi / 王毅

CAS Institutes of Science and Development / 中科院战略咨询院

Nay Pyi Taw, Myanmar, 6 June 2018

报告提纲 **Outline**

1

中国的可持续发展：理念引领型发展

*Trajectory of Sustainable Development in China:
Concept-leading development*

2

生态文明建设：系统设计与综合保障

*Ecological Civilization: systematic top design and
comprehensive guarantee*

3

低碳转型发展：目标、路线图与协同效应

*Low-carbon Transition and Development: Targets,
roadmap and co-benefits*

中国可持续发展和生态文明建设的路径依赖

Path dependency of policy-making for Sustainable Development (SD) and Ecological Civilization (EC)

- Policy-making path dependency: *Conception-leading Development*, from GDP-Centered to Protection First
 - New idea → Plan with Targets → Pilot & Program → Scaling up
- In China, the SD is a long-term strategy since 1990s. **Ecological Civilization** will be the leading concept for China's sustainable development to 2050
- As a core component of EC, *the Green Transition and Development* and a structural change are crucial in a new era of socio-economic development with Chinese characteristics
 - Resolve the environmental and resource issues first
 - New green drivers for the economic restructuring and industrial upgrading: green industry & industrial greening, *incl.* resource/energy efficiency, environmental service, clean energy, new energy vehicle industry, etc.
 - Integration into the other development concepts

中国的新发展理念/理念引导型发展

Path Dependence: New development idea/targets -oriented

- **1996: Sustainable Development**, as a national strategy
- **2002: New industrialization path**
- **2003: Scientific development concept/balanced development**
highlight the sustainable development
- **2004: Resource-Efficient and Environment-Friendly Society (REEFS) and Circular Economy (CE)**
- **2006: Energy efficiency and pollutants reduction approach**
(the 11th and 12th FYPs)
- **2009: Low-carbon development**
- **2012: Ecological Civilization (EC):** new governing philosophy,
like Chinese version of sustainable development
- **2015: Greening/Greenization/Green Development:**
 - Green transition of production and consumption pattern
 - 5 development concepts in one
- **2017: Xi Jinping Thought on the socialism with Chinese characteristics for a new era: *Green is Gold*** as a key principle of ecological civilization

实现发展理念的综合措施（2006-2020）

Comprehensive Measures for Realizing the Development Ideas

- **Legal framework**
- **Planning framework:**
 - National Five-Year Plan (FYP), approved by the NPC
 - Key area plans, like a plan of emerging strategic industry
 - Sectoral plans: such as energy, resource & energy efficiency, pollution control, renewable energy, new type of urbanization, etc.
 - Local FYP framework
- **Action plan and comprehensive implementation program, supporting policies**
- **Pilot project: CE, REEFS, Low-Carbon/ETS, EC, etc.**
- **Policy review and scale-up**

立法及实施：2000年以来有关环境保护和绿色发展的法律

Legislations for promoting environmental protection and green development since 2000

- **Water Law** (issued 1988; amended 2002)
- **Environmental Impact Assessment Law** (issued 2002)
- **Energy Saving Law** (issued 1997; amended 2007)
- **Circular Economy Promotion Law** (issued 2008)
- **Renewable Energy Law** (issued 2005; amended 2009)
- **NPC Resolution on Addressing Climate Change** (2009)
- **Cleaner Production Promotion Law** (issued 2002; amended 2012)
- **Environmental Protection Law** (issued 1989; amended 2014)
- **Air Pollution Prevention and Control Law** (issued 1987; amended 2015)
- **Environmental Protection Taxation Law** (2016)
- **Water pollution control law** (issued 1984, amended 1996, 2008, and 2017)
- **Nuclear Safety Law** (2017)
- Under revision/drafting: *Soil pollution control law* (1st review, June 2017)

五年规划框架：目标导向政策与实施（2006-2020）

FYP framework: Target-oriented policy and comprehensive implementation program (2006-2020)

- **National Five-Year Plan (FYP): 11th FYP (2006-10); 12th FYP (2011-15); 13th FYP (2016-2020); target-oriented**
 - **Long-term strategy: realize the new development approach**
 - **Mandatory targets: energy efficiency and key pollutants reduction (indicators added continuously); legally binding domestically**
 - **Targets allocation: by sector, province and key industries**
 - **Responsible system**
 - **Pilot and programs: about 87 low-carbon cities; energy saving program of one thousand enterprises during 2006-2010; energy saving and low-carbon pilot of ten thousand enterprises in 2011-2015**

报告提纲 **Outline**

1

中国的可持续发展：理念引领型发展

*Trajectory of Sustainable Development in China:
Concept-led development*

2

生态文明建设：系统设计与综合保障

*Ecological Civilization: systematic top design and
comprehensive guarantee*

3

低碳转型发展：目标、路线图与协同效应

*Low-carbon Transition and Development: Targets,
roadmap and co-benefits*

习近平总书记：绿水青山就是金山银山 (2005)

“Green is Gold” (by President Xi in 2005) is the basis of EC



“Green is Gold”

Yu village, Anji county (location of bamboo forest in *Crouching Tiger and Hidden Dragon*), Huzhou, Zhejiang Province, 2005

- **Xi's Thought is a long-term and systems thinking** based on his practices at local level for about 30 years, which grew out of his practices in *Fujian province* from 1985 to 2003, such as water and soil erosion control, small watershed management and ecological province, and then formed in *Zhejiang province* later
- *Huzhou in Zhejiang province*, upper reach of Taihu lake, which had caused serious pollution in 1990s
- *The Yu Village* closed some pollution-intensive factories, such as cement, early 2000s.
- Xi gave a high value on Yu village's activities, and had a comprehensive statement on “Green is Gold” in August 2005
 - Make a balance of development and the environment
 - Protecting the environment assets could bring the “gold”
 - Trade-off analysis and Options to develop a environment-friendly industry

生态文明的顶层设计

Top Design for Building the Ecological Civilization (EC)

- Background: macro-judgement of **a new normal**: new stage of middle high speed growth, changing the driving force, and restructuring
- **Top design**: issue or approve a series of documents for EC institutional arrangements by the CPC central committee, the State Council, and the NPC
- **Main ideas and regulations of EC**: like a Chinese version of sustainable development, but combination with China's value system
 - **Orientation**: overall layout of **Five-in-one**, integrating ecological civilization into the whole process of economic, social, political and cultural development
 - **Principle**: **Change the governing philosophy** from GDP-centered to the Protection first
 - **Approach**: Reform tasks assignment and strengthen the integration, systematic, and governance system improvement
 - **Pathway and priorities**: promote the **development of green economy, circular economy, low-carbon economy**
 - ✓ Optimize spatial pattern of national land;
 - ✓ comprehensively promote resource conservation;
 - ✓ enhance efforts on ecosystem and environment protection;
 - ✓ institutional building for ecological civilization

中共19大报告的生态文明建设最新进展

New approach on Ecological Civilization of the 19th CPC Congress

- Strategy and Targets in the New Era of socialist modernization with Chinese characteristics
 - **Development pattern transition through greening strategy:**
 - ✓ 5 concepts of development: innovative, coordinative, **green**, opening up and shared
 - ✓ Strengthen an **integrated approach** to resolve the resource and environmental problems and pursue a harmony between human being and nature
 - ✓ **Establish a modernized economic system with green and low-carbon features:** High speed → transition to a **high quality of development**, by changing the model, optimizing economic structure, and finding new drivers, and facilitating the green, low-carbon, and circular economy development
 - ✓ Create a market-oriented innovation system for green tech., develop three key industries including energy saving and environmental protection, new energy, and cleaner production
 - **Protection strategy: accelerating** to achieve the green targets in 3 stages
 - ✓ 2020, deal with environmental pollutions first
 - ✓ 2035, realize the targets of a Beautiful China
 - ✓ 2050, reach a new height of ecological advancement
 - Improve the **governance system** and capacity building of governance: institutional arrangements and social participation
 - **Global approach:** participator, contributor, and guider to global environmental agreements and to global climate governance

中共十九届三中全会及2018年两会通过政府机构改革

Govt. System Reform on ecological civilization based on decision of 2rd meeting of the 19th CPC Congress and Two Sessions in 2018

- Party's leadership: from leading groups to committees, etc.
- Comprehensive implementation of the rule of law, institution arrangements
- From concept-led to a top-level systems design
- Long term approach to 2050
- Main functions of environment-related ministries:
 - Ministry of Natural Resources
 - ✓ *Perform uniformly the duties* of the owner of public-owned natural assets
 - ✓ *Perform uniformly the duties* of regulating the right of use of all territorial space and the duties of protecting and restoring ecosystems
 - ✓ State Forestry and Grassland Agency / National Park Administration
 - Ministry of Ecology and Environment
 - ✓ *Perform uniformly the duties* of regulating and conducting administrative law of ecological conservation and the discharge of all pollutants in urban and rural areas
 - ✓ Central environmental supervision
 - ✓ Addressing climate change: both advantages and disadvantages
 - National Development and Reform Commission
 - ✓ Energy management
 - ✓ Energy conservation, comprehensive coordination of environmental protection , and circular economy development
 - Relevant agencies, establish the International Development and Cooperation Agency, etc.

中国生态文明建设和绿色发展的主要特点

Highlights of Ecological Civilization and Green Development in China (vs. SDGs)

- Highlights for building an **Ecological Civilization**: *Chinese version of Sustainable Development but some differences*
 - Overall and systems engineering, integration approach
 - From GDP-centered to **Protection first** and **Green transition** and development: **new balance** of development and protection, *incl. circular economy and low carbon development; structural reform by supply side*
 - **Co-benefits** of conventional pollution control, addressing climate change, socio-economic transition
 - Prioritized and **Mandatory targets-oriented**, and **environmental quality centered**
 - Setting up **institution/regulation system first** for life-cycle management of the environment
 - Top design + Long-term targets + Pilot + Responsibility
 - **Market** + Gov't (effective role): employ the market-based instruments, green finance, PPP, etc.
 - Two main drivers: **reform and innovation**
 - Capacity development and **Governance system** improvement
 - **Global dimension**: realize the commitments for SDGs, NDC, and reform the global environmental governance, greening the Belt and Road Initiative, south-south cooperation on climate

报告提纲 **Outline**

1

中国的可持续发展：理念引领型发展

*Trajectory of Sustainable Development in China:
Concept-led development*

2

生态文明建设：系统设计与综合保障

*Ecological Civilization: systematic top design and
comprehensive guarantee*

3

低碳转型发展：目标、路线图与协同效应

*Low-carbon Transition and Development: Targets,
roadmap and co-benefits*

“十三五”期间的绿色约束性指标

Green targets in 2016-2020

- **Mandatory targets: 10 types and 16 targets**
 - **Resources and Energy: *double control* (efficiency + cap control)**
 - ✓ **Land: arable land, keep stable at 1.865 Bn. mu; newly-increased construction land, < 32.56 Mn. mu**
 - ✓ **Water: water use: 670 Bn. M³ (*non mandatory*), water use per 10000 yuan of GDP, 23% ↓**
 - ✓ **Energy: total energy consumption: 5.0 bn. tce (*non mandatory*), energy intensity, 15% ↓ (16% in the 12th FYP)**
 - **Environment: *the quality centered* (driving the economic restructuring)**
 - ✓ **Environmental quality:**
 - Air quality: two targets, incl. PM2.5
 - Quality of surface water: two targets
 - ✓ **Pollutant reduction:**
 - COD 10% ↓ (8% in the 12th FYP)
 - NH₃-N 10% ↓ (10% in the 12th FYP)
 - SO₂ 15% ↓ (8% in the 12th FYP)
 - NO_x 15% ↓ (10% in the 12th FYP)
- *Note: the indicator with orange color refers to non-mandatory targets*

“十三五”期间气候和煤炭指标

Low Carbon targets in 2016-2020

- **Climate change targets in 2016-2020:**
 - ✓ Carbon intensity, **18% ↓** (17% in the 12th FYP, non fossil fuel contribution more than that in 12th FYP)
 - ✓ **Share of non-fossil energy, reach at 15% (12% in 2015)**
 - ✓ **Forest area: 23% (21.7% in 2015)**
 - ✓ **Timber stock volume: 1.65 Bn m³ (1.51 Bn m³ ↑ in 2010-2015)**
- **Coal targets in 13th FYP Energy Plan:**
 - ✓ Coal share: 58%
 - ✓ Coal use for coal-fired power plant: 310 gce/kWh
- ✓ Hopefully, CO₂ intensity will be 50% lower than that of 2005, which exceeds the goal of a 40~45% reduction China committed on Copenhagen Climate Accord

2030年的气候和能源指标

Low Carbon targets in 2030 and beyond

● **Targets in 2030 (China's NDC)**

- ✓ Carbon emissions peak by around 2030 or earlier
- ✓ Share of non-fossil energy, 20%
- ✓ CO₂ intensity, 60-65% ↓ (2005-2030)
- ✓ Timber stock volume: 4.5 Bn m³ ↑ (2005-2030)

● **In 2030, electricity from non-fossil fuel will account for 50% of total electricity generation**

- ✓ At that time about 50% of primary energy will go for power generating, so the proportion of non-fossil fuel in primary energy would be about 25%.

● ***Energy Production and Consumption Revolution Strategies 2016~2030 (EPCRS)***

- ✓ propose to control total energy consumption to less than 5 billion tce in 2020, less than 6 billion tce in 2030, and to have it stabilized in 2050.

“十三五”期间的精准扶贫

Targeted Poverty Alleviation in 2015-2020

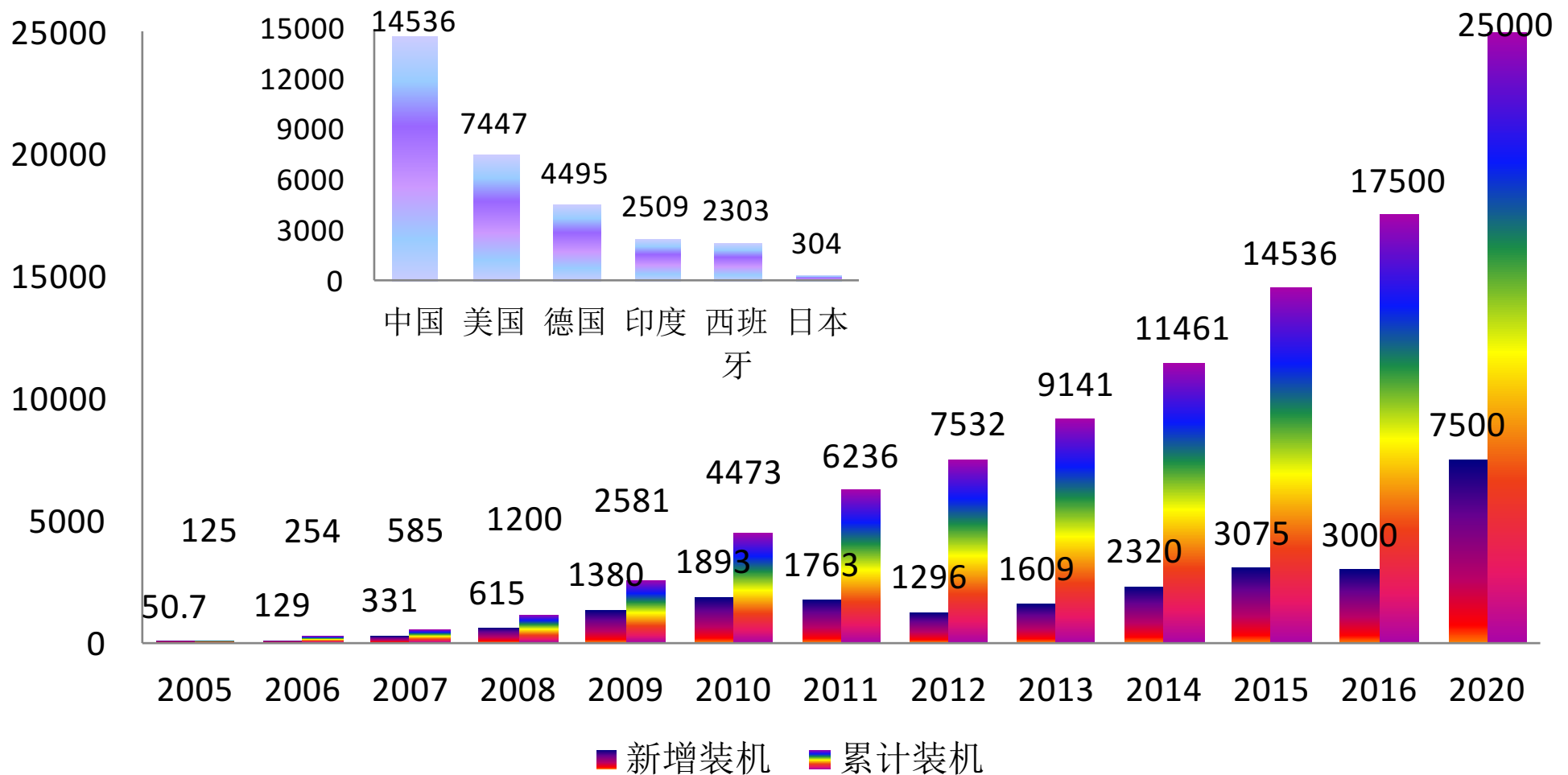
- **From 2013-2016:** reduce rural poverty people by 55.64 million, 13.91 million annually; but 43.35 million still
- **Actions adopted:**
 - Goal: poverty eradication in 2020 at current poverty standard (per capita net income ¥2300/a.)
 - Establish a poverty alleviation system, set up action plan, and issue some key policies, including eco-compensation improvement
 - Promote a targeted poverty alleviation from identifying poverty people
 - Comprehensive solutions adopted, such as, **poverty reduction by ecological conservation**
 - ✓ Provide jobs for conservation
 - ✓ PV support
 - ✓ Eco-tourism
 - ✓ E-business pilot, etc.
- **Current problems:** heavy task, alternative livelihood, funds, differentiated policy, etc.
- **It depends on China's political system resource, maybe it's difficult to copy**

中国的风电发展

Wind Growth in China

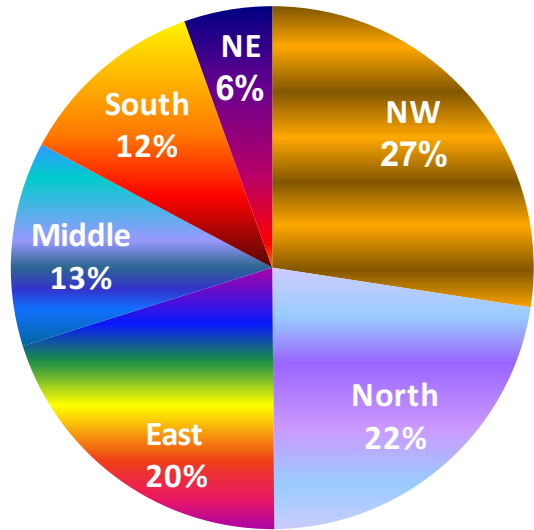
Top 6 countries of Wind installed in 2015

New added and accumulated Wind Capacity Installed



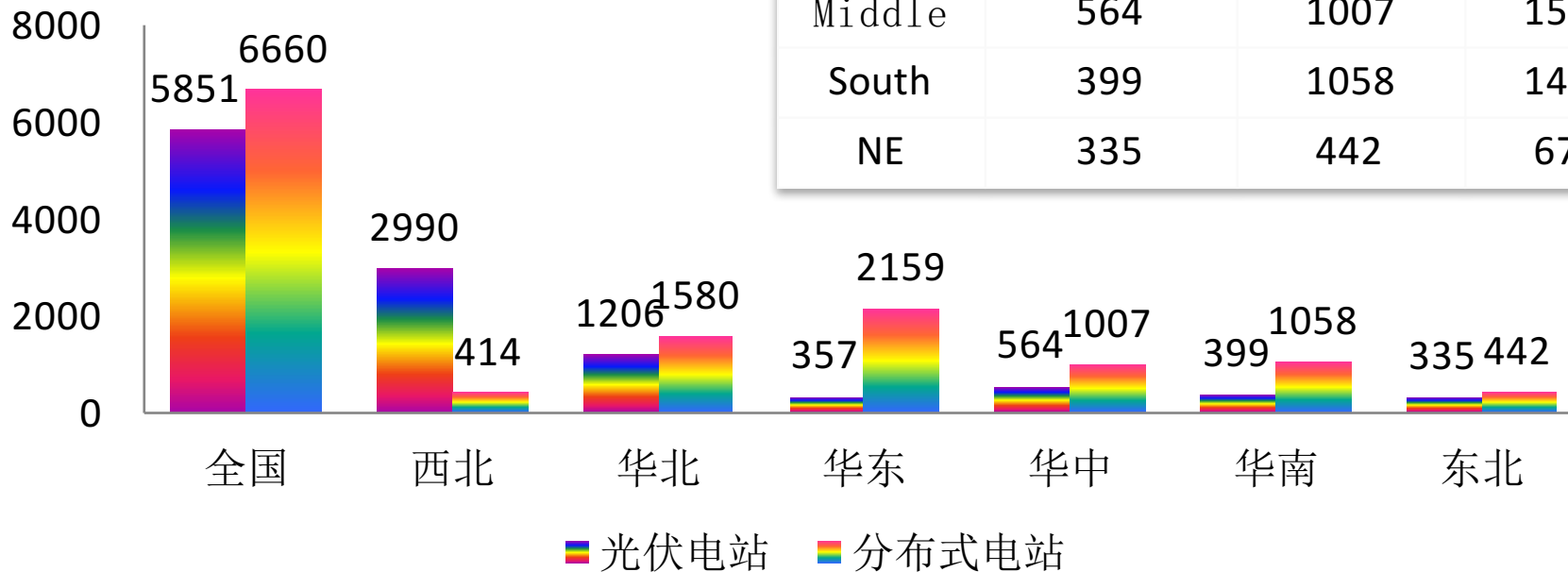
中国的光伏发展

PV Growth in China



PV development Plan to 2020

Region	PV station	Distributed	Total Installed	Share
Total	5851	6660	12411	100%
NW	2990	414	3404	27.4%
North	1206	1580	2786	22.4%
East	357	2159	2516	20.3%
Middle	564	1007	1571	12.7%
South	399	1058	1457	11.7%
NE	335	442	677	5.5%





未来中国生态文明和绿色转型发展: 国际合作1

International cooperation (1)

- Explore a *New development model* and a *Mid-century Strategy* to realize the SDGs and NDC
- *Greenization and Decarbonization with socio-economic and energy transition*: sharing cost and risk, partnership
- *Advanced tech development*: energy/resource efficiency, clean and renewable tech package, integrated tech (smart+green), green tech transfer,
- *Tech introduction and dissemination*, especially for quality improvement, business model and best practice
- *Best practice sharing*: policy, management, standard/benchmark system, business model, carbon-free demo engineering, etc.
- *Systems innovation and institutional arrangements*: such as, the most effective market-based instruments, new environmental market by region

未来15年中国生态文明和绿色转型发展: 国际合作2

International cooperation (2)

- ***Governance pattern reform***: at int'l, nat'l & sub-nat'l levels, fine and adaptive mgmt., managing the uncertainty and transition, social governance reform
- ***Policy toolkit and analysis for quality-based development***, such as, **green design, standards and integrated planning** for green region/city development, roadmap for green/decarbonization transformation (multi-step scenarios), MRV for the environment, comprehensive assessment (like NDC reviewing & stock-taking), **green finance** and PPP, global value chain, life-cycle change, modelling development and simulation
- ***Building cooperation platform and innovating development aid mode***, based on multi- and bi-literal coop, such as G20 and other int'l platform, green and low carbon city alliance; supporting **BRI and South-South Cooperation**, etc.

探索包容、合作与共赢的全球绿色转型发展之路

Explore an inclusive, collaborative, co-benefit solution to green transition and development

- China faces **unprecedented challenge** as there is no mature experience and fixed mode to refer to
- The relation and diversified goals (SDGs) of the development and protection should be balanced to raise the **synergic effect** in a transitional period.
- **Roadmap** to a green transition and development is one process requiring continuous learning, practice, reform, and innovation (learning by doing)
- The green transformation requires taking **comprehensive measure** and systems reform at all round, and to be jointly participated by all the stakeholders (combination of top-down and bottom-top)
- Establish the **global green transition/development partnership**: reduce the costs and risks, share the best practice, realize a win-win solution



中国科学院科技战略咨询研究院

Institutes of Science and Development, Chinese Academy of Sciences

谢谢关注!

Many Thanks for your attention!

wangyi@casisd.cn

