

North-East Asia Development Cooperation Forum

Technology Transfer **China as Recipient and provider**

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1. The experiences of China in technology transfer
 2. The major requirements for efficient and effective technology facilitation
 3. The motives and processes of China to facilitate technology transfer as a provider



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1. Experiences of China in technology transfer

Technology transfer stream
Down stream

Developed
Nations

Hi tech
Providers

Developing
Nations

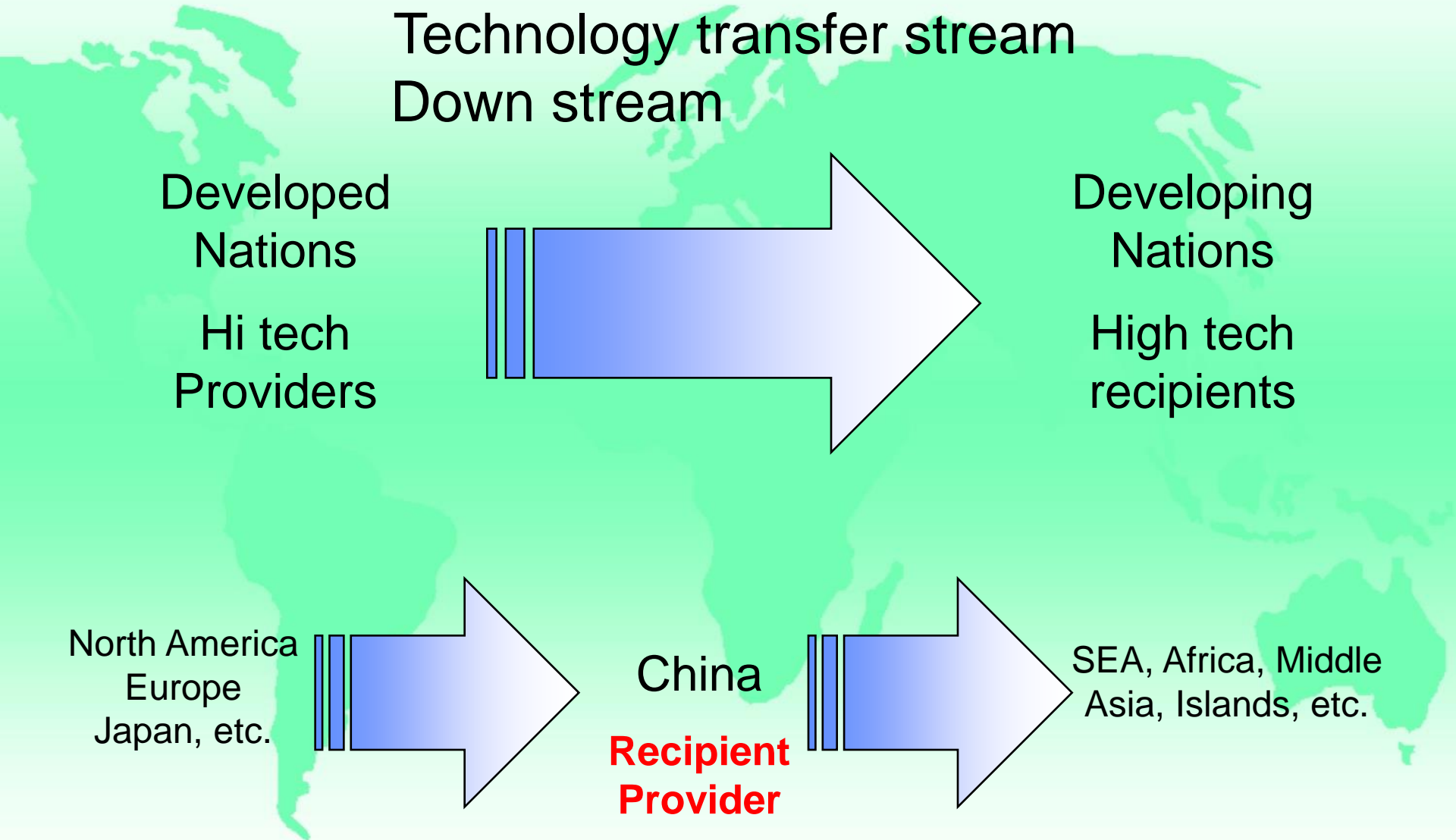
High tech
recipients

North America
Europe
Japan, etc.

China

**Recipient
Provider**

SEA, Africa, Middle
Asia, Islands, etc.



1. Experiences of China in technology transfer

China Technology transfer Sectors

Recipient

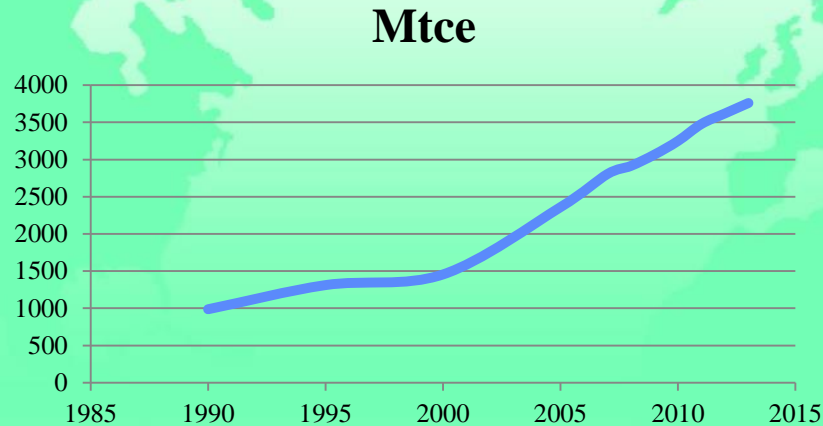
- Energy
- Renewable energy
- Environment
- Energy saving
- Biomedical
- Supercomputer
- Nanometer/new material
- biological technology
- Astronautics
- ...
- Not embargoed

Provider

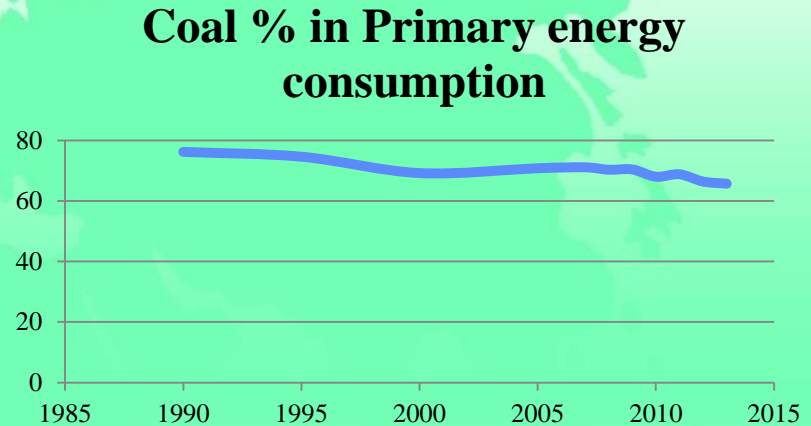
- Energy
- Renewable energy
- Environment
- Energy saving
- Agriculture
- Industrial manufacturing
- Express railway
- Scientific technology
- Health
- ...

1. Experiences of China in technology transfer

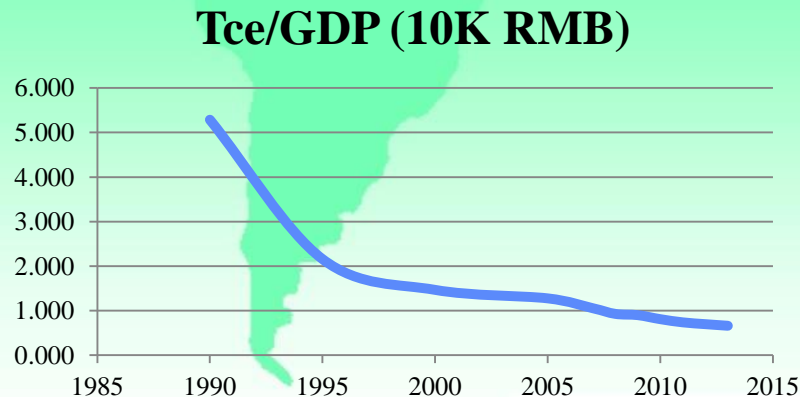
Coal consumption



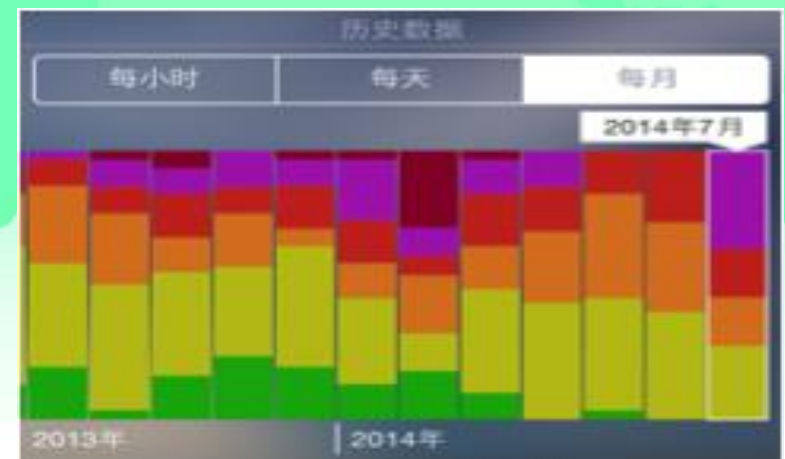
Coal % in premium energy



Energy Consumption Intensity

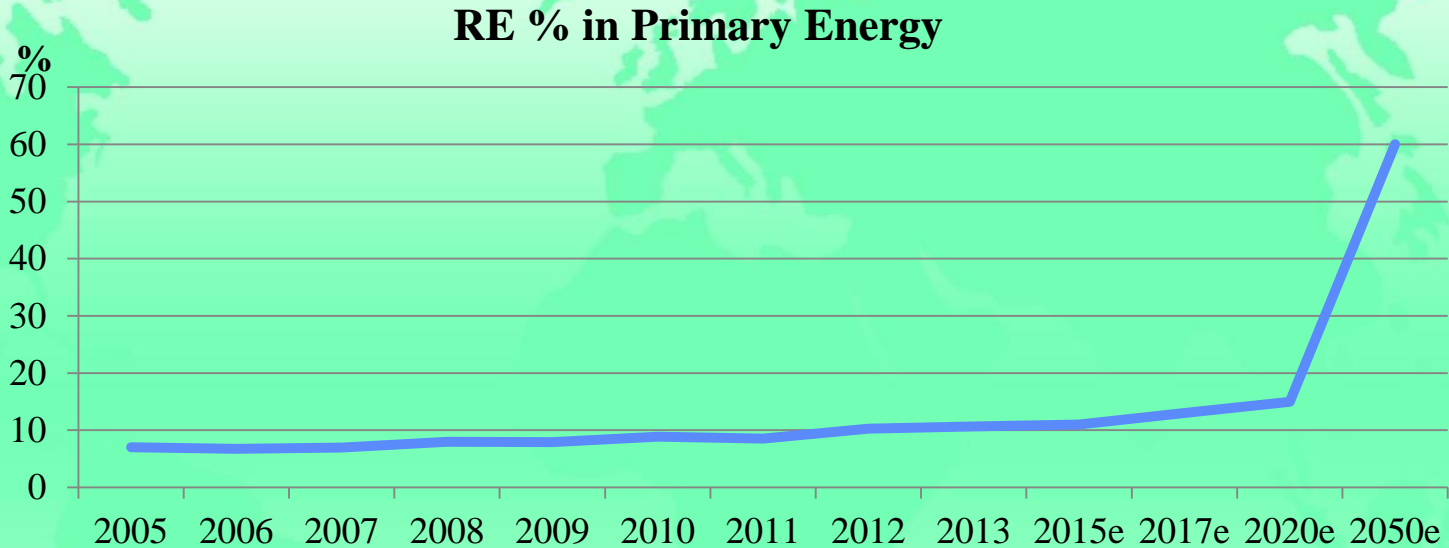


Air Pollution



1. Experiences of China in technology transfer

Percentage of RE in primary energy in China



Technical Challenges to China Renewables

- Grid connection
- Long distance transmission
- Large capacity WT
- Off-shore wind
- Solar PV efficiency
- New type PV
- CSP
- Ocean energy
- Bio-fuel
- Energy utilization efficiency

1. Experiences of China in technology transfer

China Technology Transfer (Provider)

Sport center in Liberia



Wind/PV off-grid in Kazakhstan



China agri expert in Africa



Gov't officials Training in China



1. Experiences of China in technology transfer

Technology transfer Modalities in China (1)

- International cooperation O2G

UNDP/GEF: Capacity Building for Rapid Commercialization of RE in China

World Bank: REDP, CRESP (China RE Scale-up Program)

ADB: Energy for All, Low carbon, Energy efficiency,...

...

- Bilateral/Multiple lateral G2G

US-China: EF, Renewable Energy Cooperation Partnership, ...

Denmark-China: WED, RE Development Program

China-Japan-Korea: RE Cooperation and Development Program

Canada: CIDA/MOC Using Solar power in rural electrification

ASEAN: Lots of.

Asia nations: Silk Road Cooperation mechanism, etc.

GMS: Great Mekong Subregion Cooperation

China-Africa: China-Africa Cooperation Forum

...

1. Experiences of China in technology transfer

Technology transfer Modalities in China (2)

- Cross nation business B2B
 - Merger and acquisition (M&A)
 - Sany acquires the German company Putzmeister
 - Geely acquisition volvo
 - Joint or Sole venture
 - ...
- Cross nation R&D
 - Top 500 set up R&D centers in China
 - ...
- Technology Transfer Center, TTC
 - China Technology Exchange
 - China CAS Technology Transfer center
 - Italy-China Technology Transfer center
 - ...

1. Experiences of China in technology transfer

Technology transfer Modalities in China (3)

- R&D personnel carrying technology to develop entrepreneurship in other nations, I2B

Overseas student back home

Immigration

...

- Donation

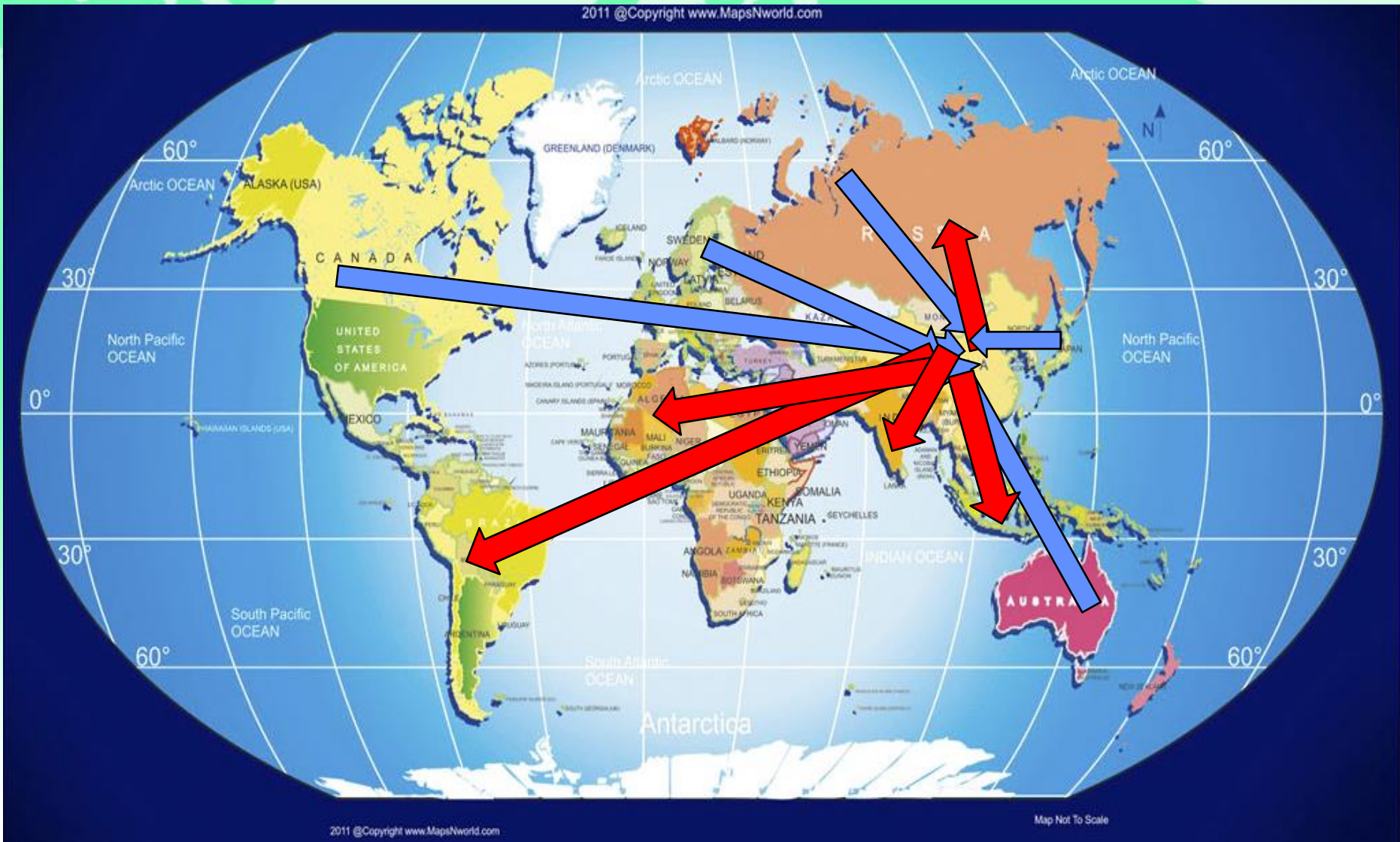
Demonstration or pilot project: China MOC

China NDRC project

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1. Experiences of China in technology transfer

Major Geographic focus of China Technology transfer





1. The experiences of China in technology transfer

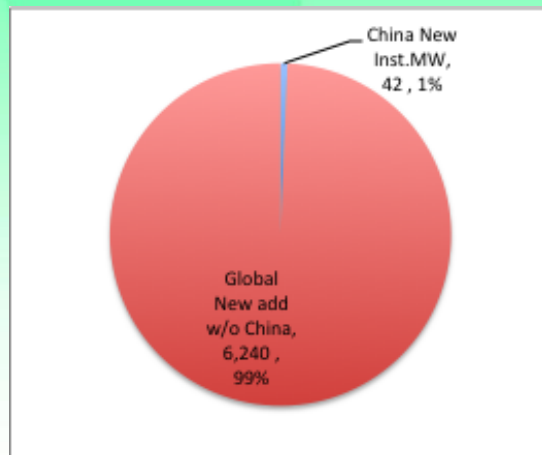
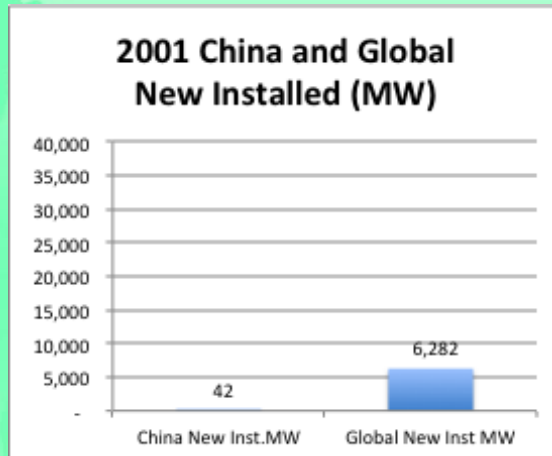
2. The major requirements for efficient and effective technology facilitation

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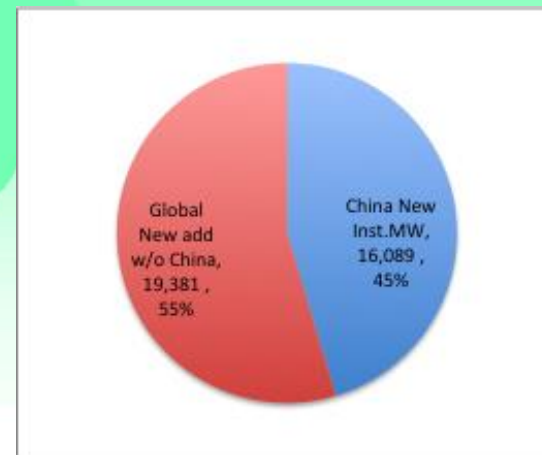
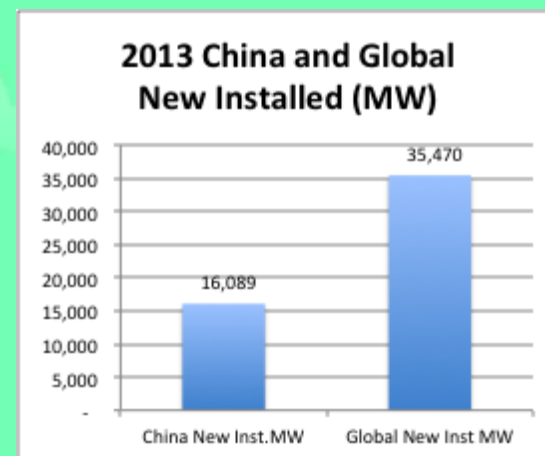
2. Major requirements for E&E tech facilitation

A successful international Tech transfer case
- China wind energy industry development

Was, 2001



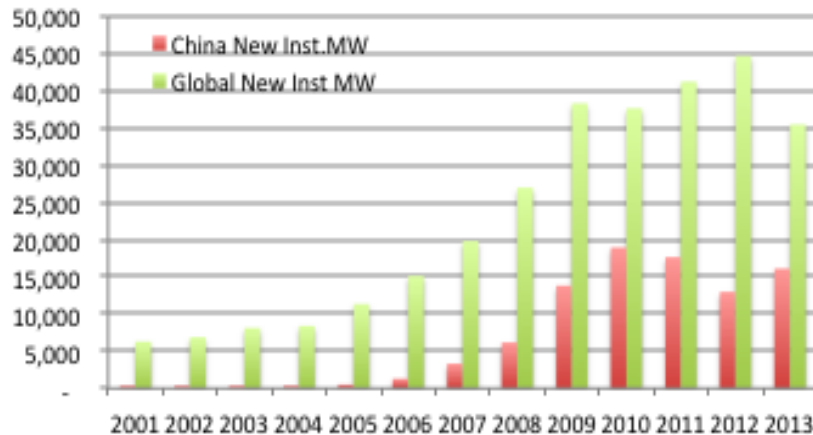
Is, 2013



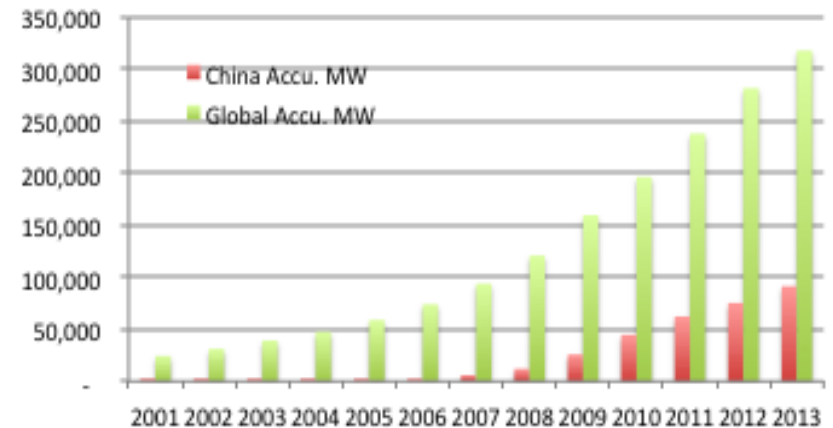
2. Major requirements for E&E tech facilitation

Tragedy of China wind power industry

Annual new inst (MW), 2001-2013

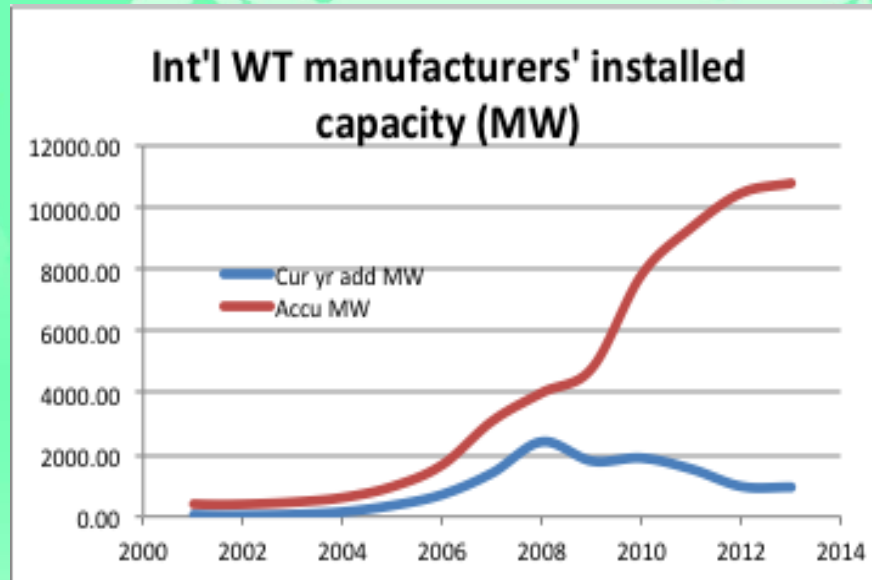


Accu. capacity (MW), 2001-2013



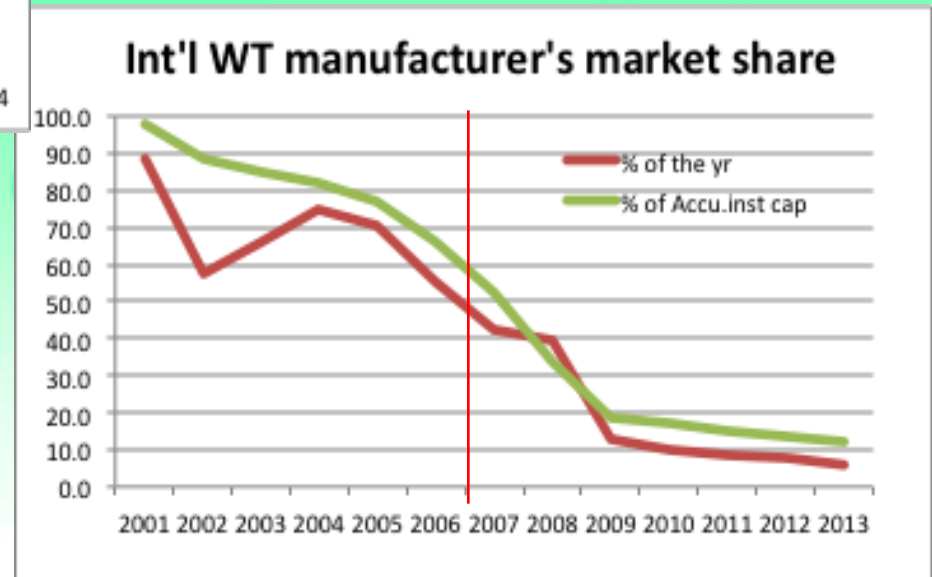
2. Major requirements for E&E tech facilitation

Development of domestic and Int'l manufacturers in China



Annual installed capacity continuously increasing between 2001-2008.

Almost 100% of accumulated installed capacity in 2001, but only 50% in 2006, then 10% in 2013.



2. Major requirements for E&E tech facilitation

Major factors in E&E Technology Transfer (1)

(1) International assistances

UNDP, CPR97/31

WB: CRESP,

US DOE/NREL: Wind mapping

EU: EEP

Germany: GTZ

Canada:

Denmark: RED

Korea: Renewable energy technology exchange

Japan: NEDO

More!

Major activities: capacity building: resource assessment,

Demo, Training, Institutional development, etc

Outcomes: Wind map, Siting technology, ..., China

Renewable Energy Law (2005)

2. Major requirements for E&E tech facilitation

Major factors in E&E Technology Transfer (2)

(2) Cross nation business development

Manufacturers: Vestas, GE, Gamesa, Suzlon, Nordex, REPower

...

Business modalities: Joint venture, Sole venture, license, joint design, ...

Sponsor: Scientific creation and innovation activities

(3) Domestic entrepreneurs' enthusiasm

Gold Wind, United Power, Mingyang, Sinovel, XEMGC,
Shanghai Shanghai Electric, DEC, Wendy,...,

(4) Government

Institutional development (RE Law), concession bidding, FIT, RE development fund, R&D,...

2. Major requirements for E&E tech facilitation

Major Requirements

Major requirements for effective and efficient technologies transfer are:

1. Systematic approach
2. International assistance (capacity building)
3. Win-win business development (Not wishful thinking)
4. Recipient enthusiasm (needs)
5. Suitable technical Potential difference
6. Government involvement (Law and regulations, Policy, incentives, etc.)



1. The experiences of China in technology transfer

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3. Motives and processes

Motives of China to facilitate technology transfer as a provider

1. Create a peaceful external environment for development
2. Cooperation in resource
3. Support sustainable economic development
4. Explore new market, increasing market share
5. Reducing risks
6. Developing international well-known brand name
7. International social responsibility
8. Lower cost of labor

3. Motives and processes

Processes to facilitate technology transfer as a provider in China

Government oriented: G2O, G2G

ASEAN, Shanghai Cooperation Organization, APEC, Asia-Europe, Regional Coop. between China and Africa

Agreement, plan, List (NDRC/MOC/MoST)

International Technical assistance: Training, Turn-key projects

Business oriented:

Overseas operation:

Direct investment (High control)

Joint venture (Medium control)

License (Slight control)

Export (Least control)

NGO:

NGO is another important way for TT, but not very active in China



Thank you for
your
attention!

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