Promotion of Technologies for Green Growth – Experiences and Lessons from the Republic of Korea

28 November, 2017

Dr. Kang Jin Won, Research Fellow,

R&D Evaluation Center, Korea Institute of Science and Technology Evaluation and Planning (KISTEP)

Table of Contents

- Introduction
- Green Growth Strategy
- Investment and Cooperation of Green Technology
- Green Technology Area and Change of scope
- Response to Climate Change
- Recommendations

Introduction

- South Korea
  - ✓The 10th largest energy consumer in the world as of 2008
  - ✓The 10th largest emitter of CO2 (528.1 Mtoe), consuming primary energy annually by 227 million ton of oil equivalent (Mtoe) (ICCG, 2012)
- Declaration of "National Vision" in August 15, 2008
  - ✓Low Carbon Green Growth
- Green Growth
  - ✓ Harmony of Economy and Environment
  - ✓ Balanced growth

Source: ICCG (2012). Green Growth Policy in Korea: A case study; http://www.greengrowth.go.kr/menu001/sub001/GRG_001_101.do

Why Green Growth of Korea?

Global Warming

- Intensifies environmental crisis
- Increases high vulnerability domestically

Energy Crisis

- Intensifies energy and resource exhaustion around the world.
- Threats a high level of dependence on fossil fuel imports

New Growth Power – Green Growth

- Directs to increase energy self-sufficiency
- Overcomes low growth with the support of new technology

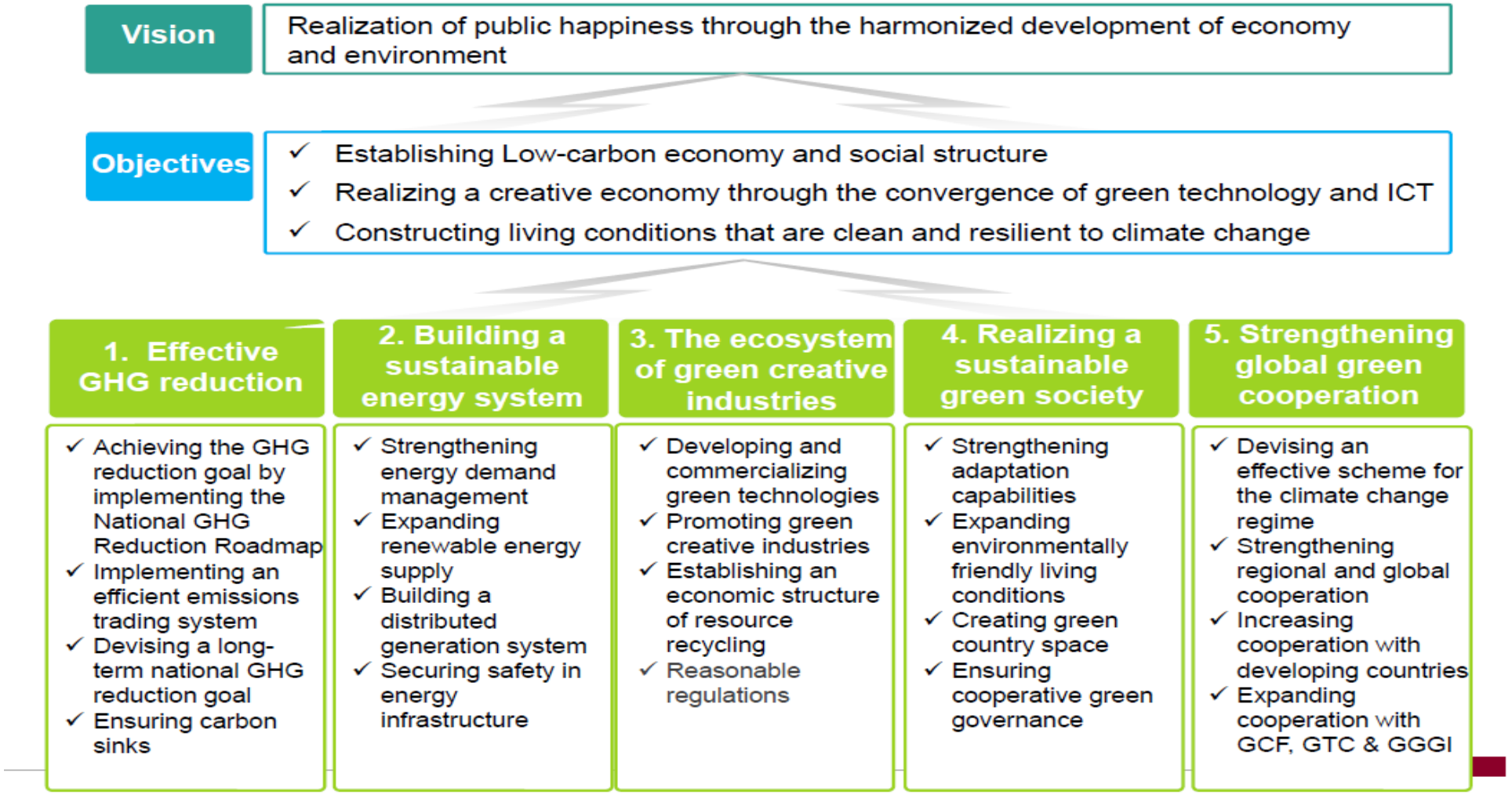
Shift to new paradigm

- Requires because of the limitation of the current economic growth paradigm
- Provides opportunities for the new national development

History of Korea's Green Growth Strategy

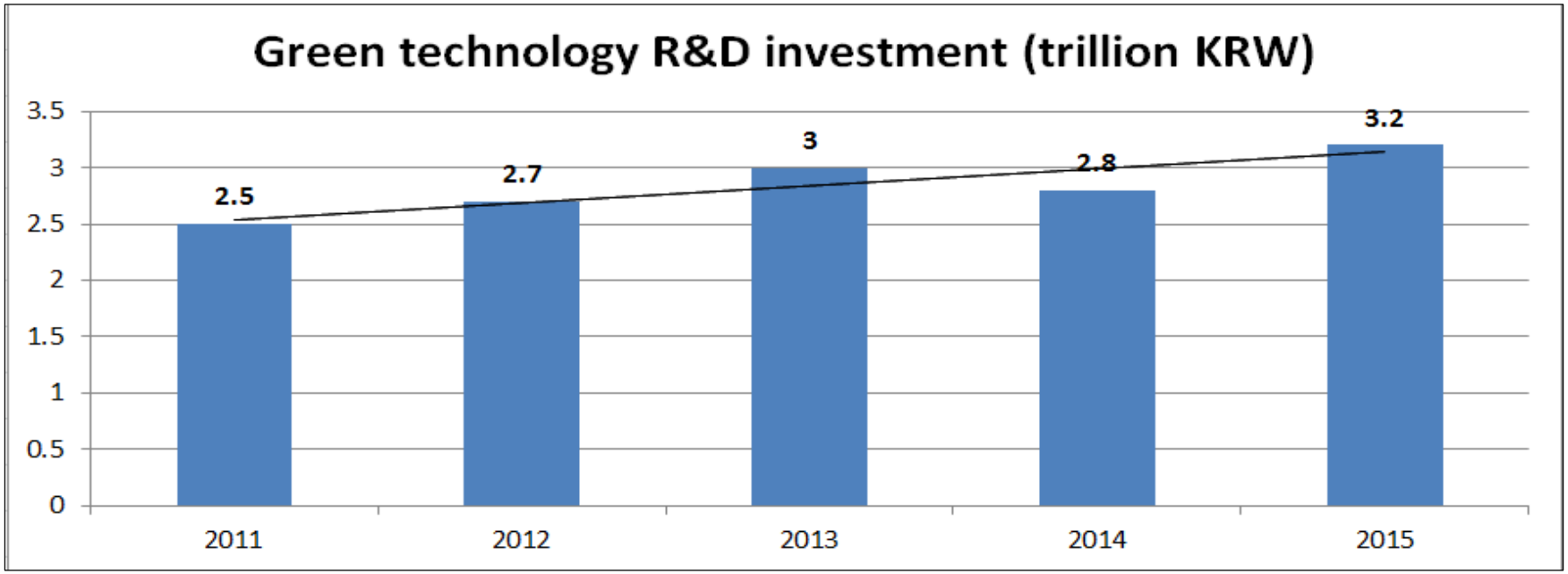
Aug, 2008	Green Growth Declaration
Jan, 2009	Comprehensive Plan of Green Technology R&D
Feb, 2009	Establishment of Presidential Committee on Green Growth (PCGG)
Jul, 2009	National Strategy & the 1st 5 year Plan for Green Growth (2009-2013)
Apr, 2010	The Framework Act on Low Carbon Green Growth (Legal Basic)
Apr, 2014	Evaluation of the 1st 5-year Plan for Green Growth
Jun, 2014	The 2nd 5-year Plan for Green Growth (2014-2018)

The 2nd 5-year Plan for Green Growth (2014-2018)



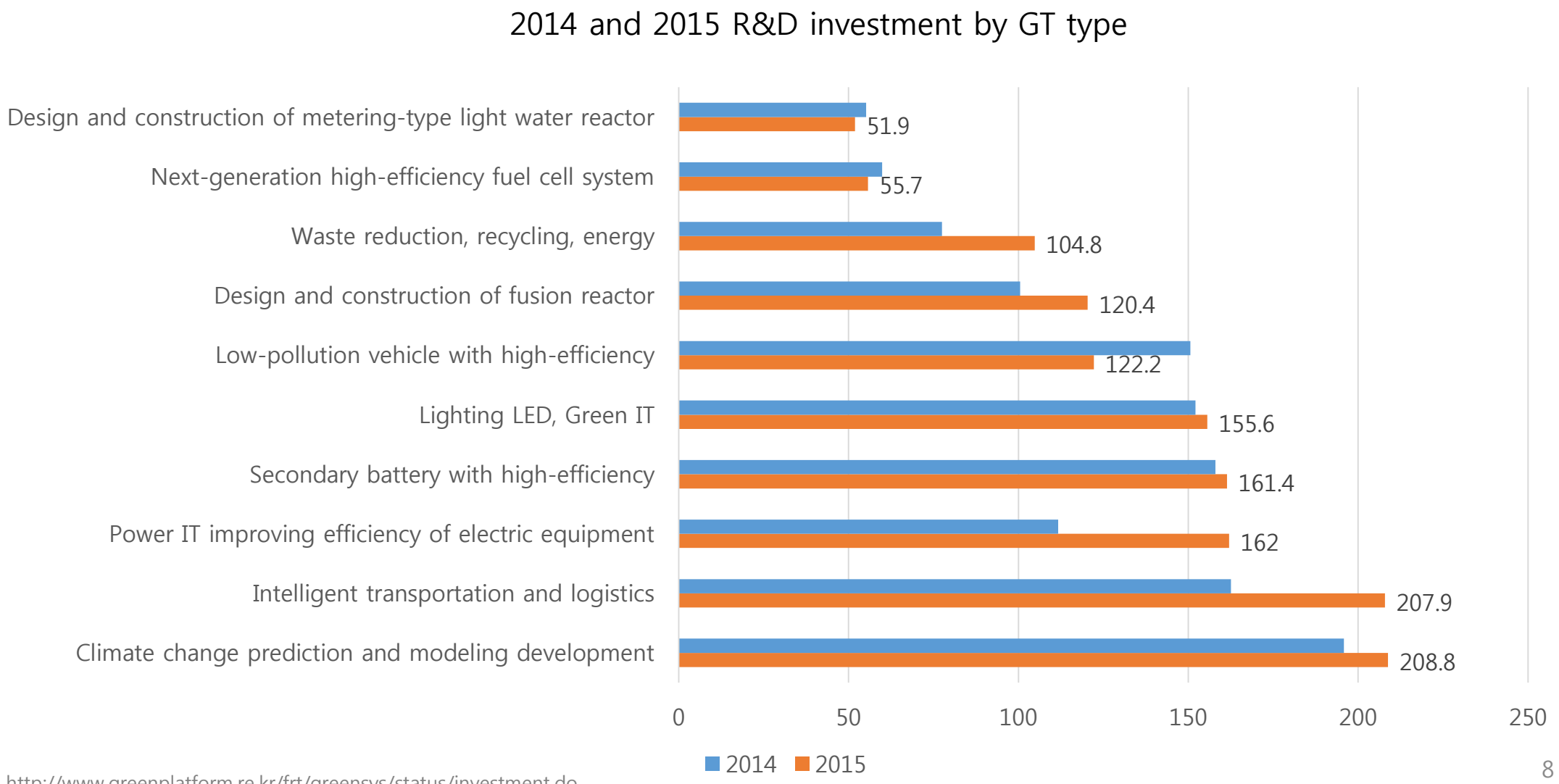
Green Technologies as National R&D investment

- In 2015, Green Technology R&D investment amount reaches 3.2 trillion won ($3 billion)
- 17.1% of total national R&D investment
- 326 Projects; 8,741 sub-projects
- 27 major green technology R&D investment takes 2.4 trillion won



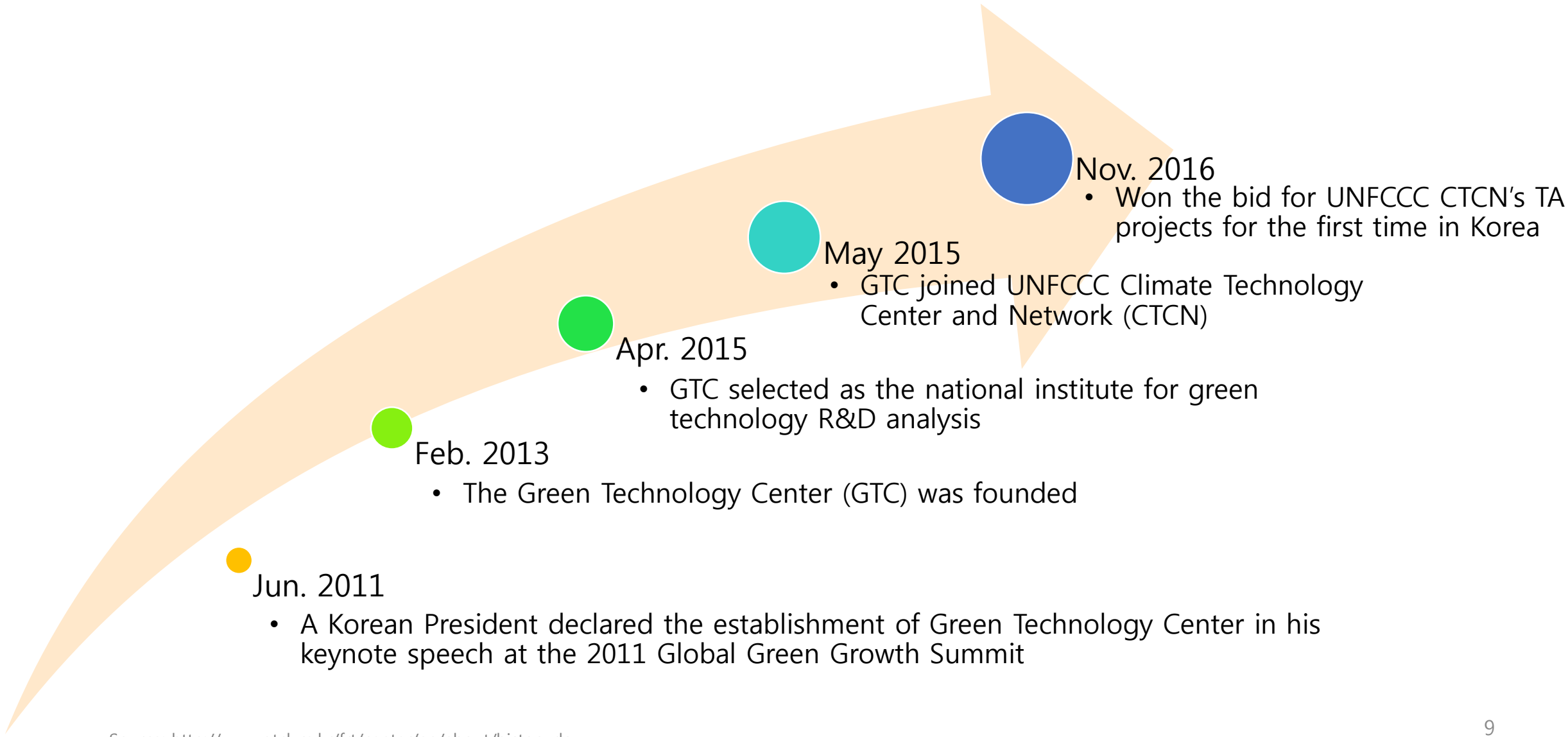
Source: http://www.greenplatform.re.kr/frt/greensys/status/investment.do

Green Technologies as National R&D investment



Source: http://www.greenplatform.re.kr/frt/greensys/status/investment.do

Green Technology Center under MSIT



Nov. 2016
- Won the bid for UNFCCC CTCN's TA projects for the first time in Korea

May 2015
- GTC joined UNFCCC Climate Technology Center and Network (CTCN)

Apr. 2015
- GTC selected as the national institute for green technology R&D analysis

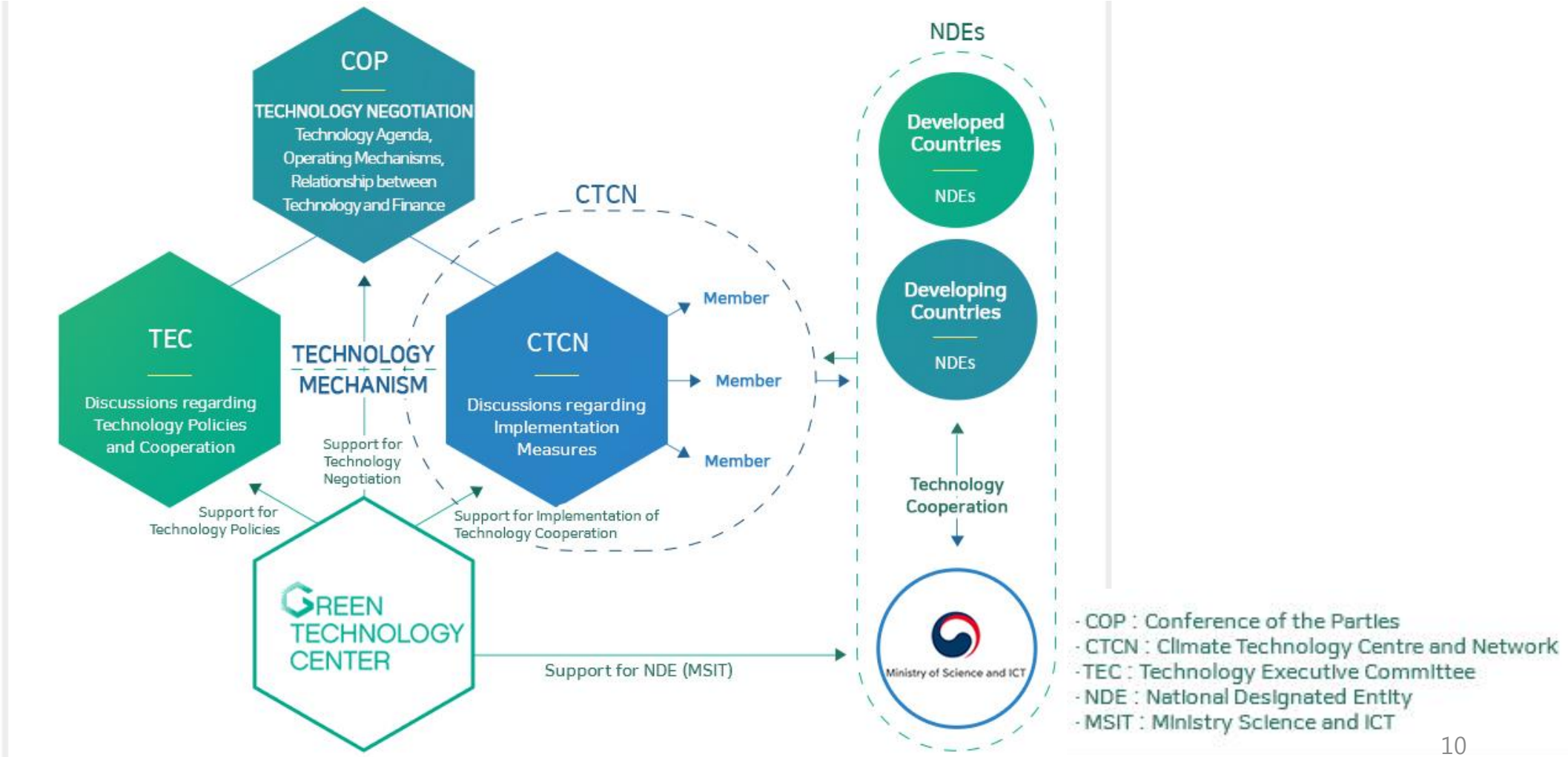
Feb. 2013
- The Green Technology Center (GTC) was founded

Jun. 2011
- A Korean President declared the establishment of Green Technology Center in his keynote speech at the 2011 Global Green Growth Summit

Source: http://www.gtck.re.kr/frt/center/en/about/history.do

Global Technology Cooperation(1/2)

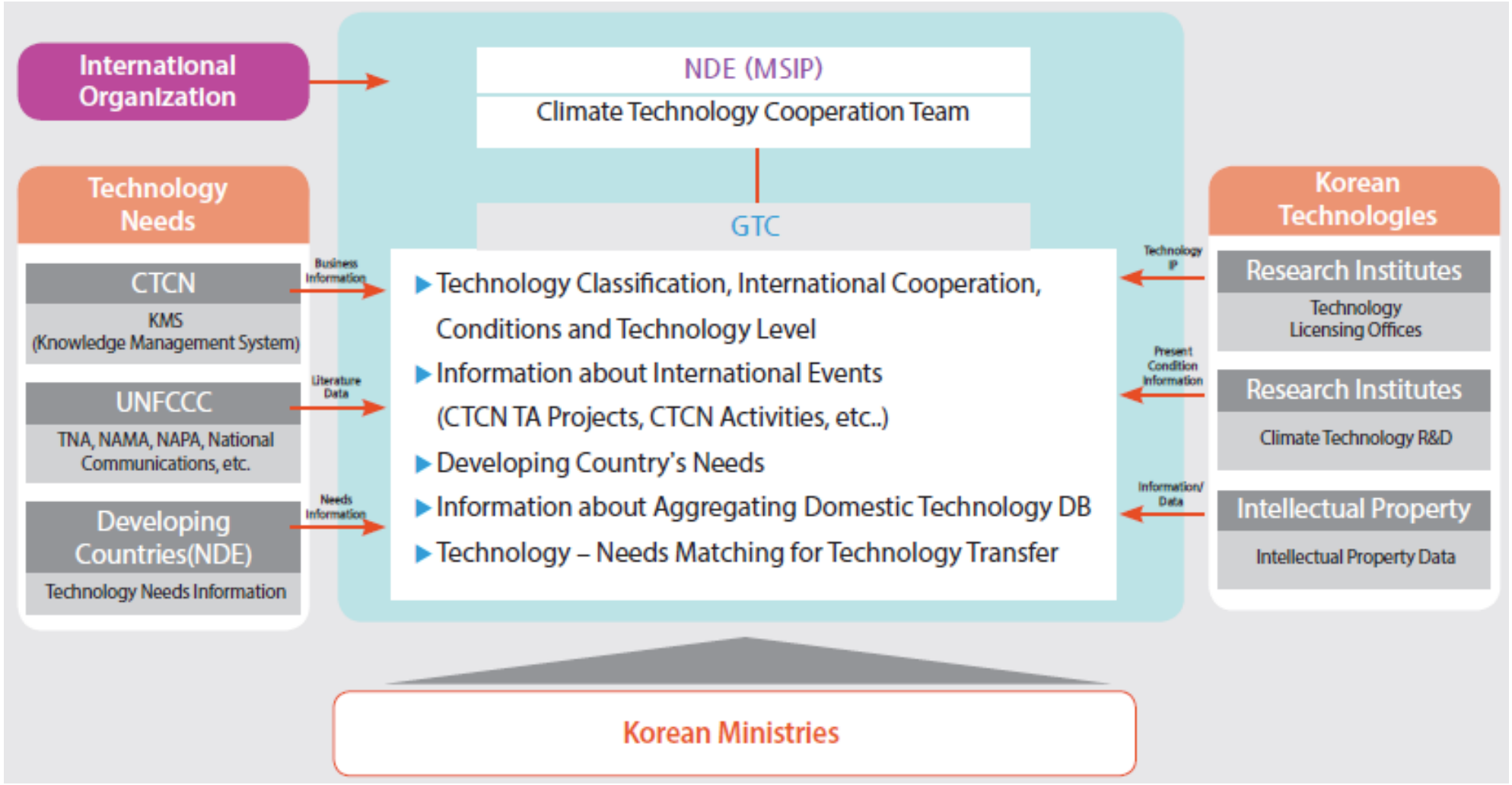
- Support for Global Technology Partnership Strategies



Source: http://www.gtck.re.kr/frt/center/en/rnd/global_cooperation.do

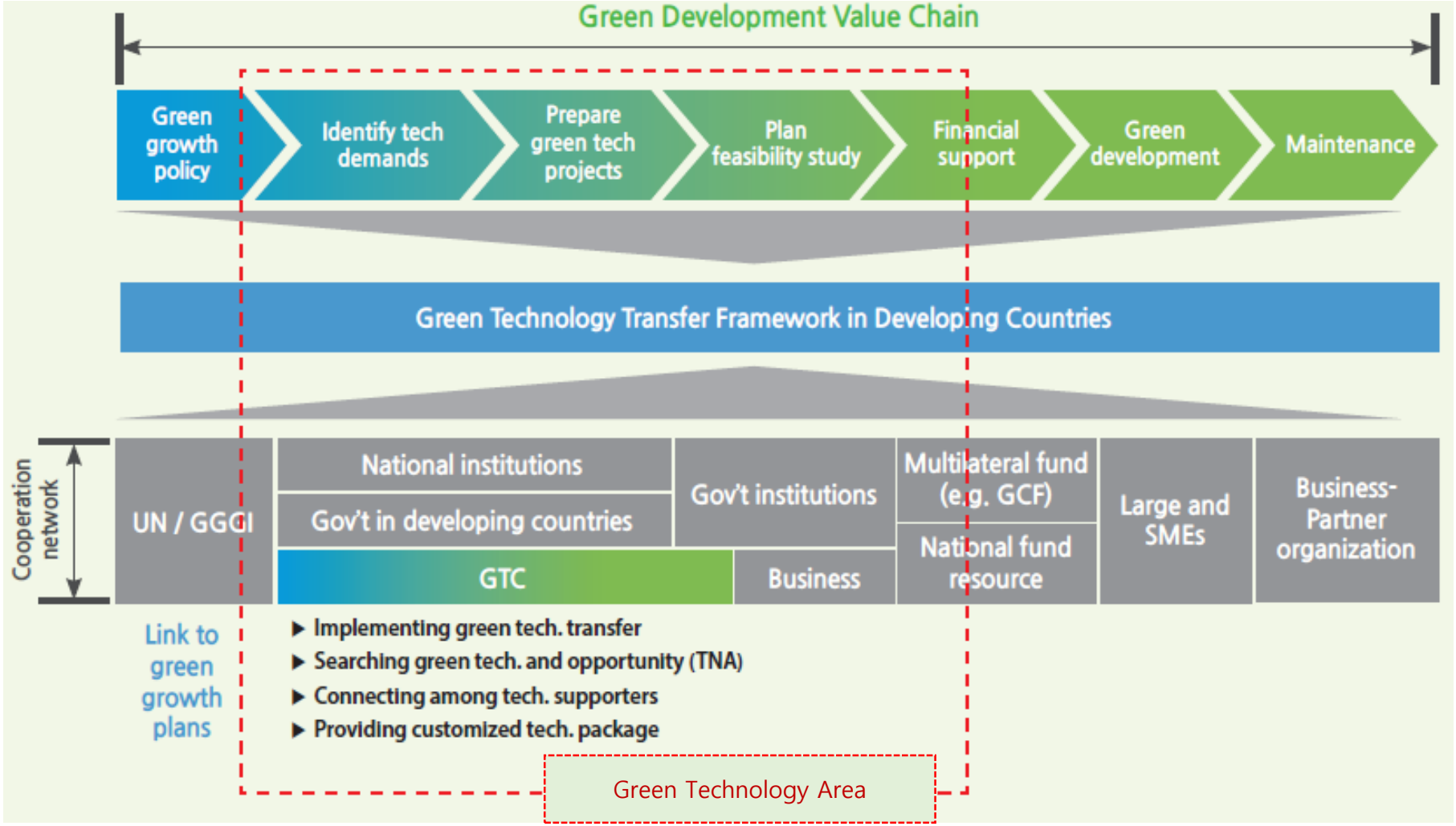
Global Technology Cooperation (2/2)

- Transfer and Diffusion of Technology to Developing Countries



Source: GTC(2016). A Global Leader of the Green Climate Technology Cooperation

Green Technology Cooperation Framework



Source: GTC(2016). A Global Leader of the Green Climate Technology Cooperation

27 Major Green Technologies

Prediction technology

- Climate change prediction and modeling development
- Impact evaluation of climate change and adaptation

High-efficiency technology

- Promoting eco-friendly plant growth
- Combined gasification of coal gasification
- Low-pollution vehicle with high-efficiency
- Intelligent transportation and logistics
- Ecological space creation and urban regeneration
- Eco-friendly low-energy architecture
- Green process
- Lighting LED, Green IT
- Power IT improving efficiency of electric equipment
- Secondary battery with high-efficiency

Pollution-free industrial technology

- Virtual reality

Energy-source technology

- Low cost of silicon solar-cell with high efficiency
- Mass production and core source of non-silicon solar-cell
- Production elements and systems of bioenergy
- Design and construction of metering-type light water reactor
- Environment-friendly nuclear nonproliferation fast cycle and circulation nuclear cycle
- Design and construction of fusion reactor
- High-efficiency hydrogen production and hydrogen storage
- Next-generation high-efficiency fuel cell system

Post-processing technology

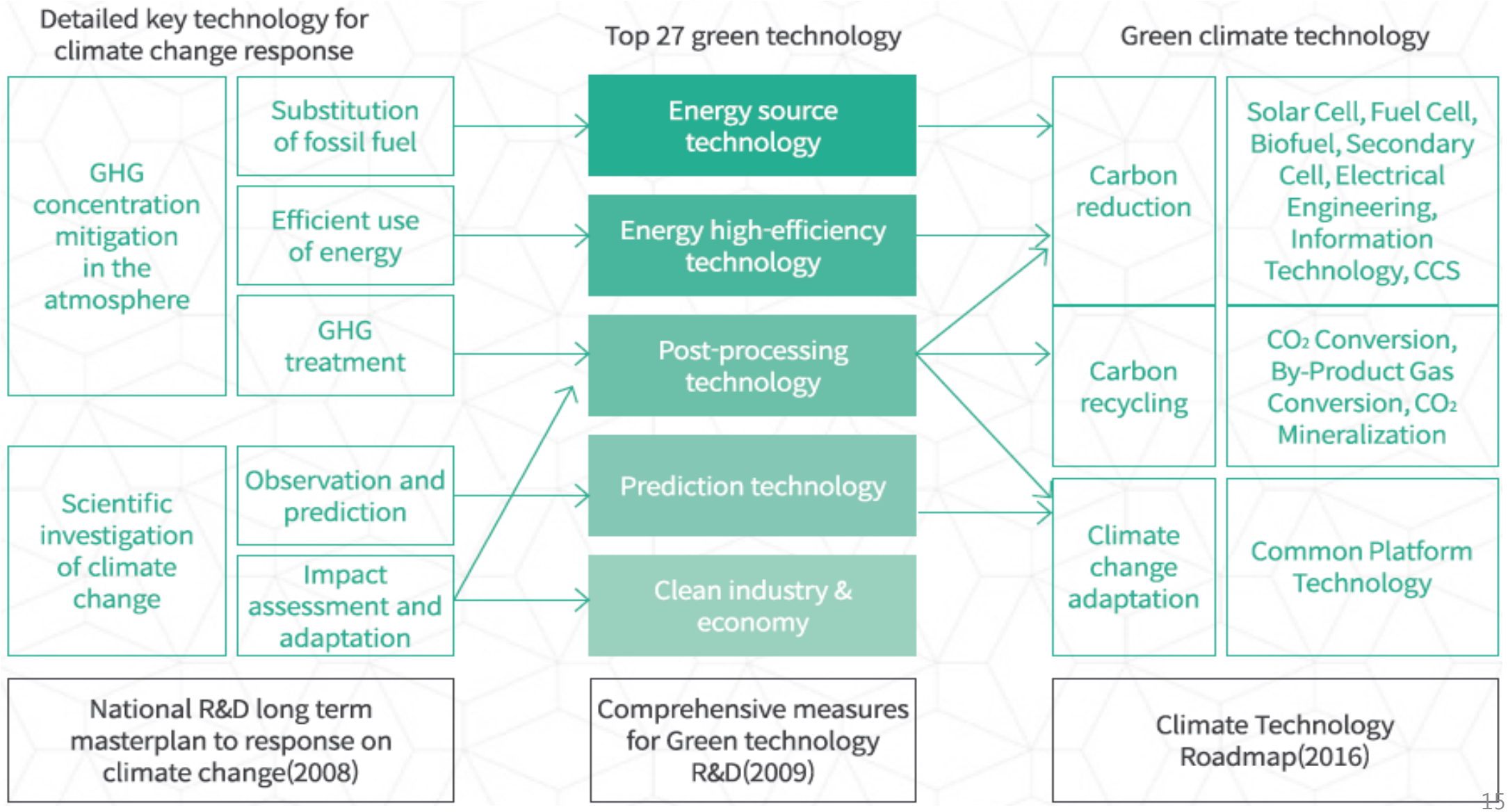
- Collection, storage, processing of CO2
- Processing of non-CO2
- Water quality assessment and management
- Securing alternative water resources
- Waste reduction, recycling, energy
- Monitoring of harmful substances and purification of environment

Green Climate Technology

Definition

A comprehensive terminology that includes both "Green Technology" minimizing GHG and pollutants and "Climate Technology" responding to climate change which enhances the efficiency of energy and resource uses.

Green Climate Technology: Areas & Change of Scope



Source: GTC(2017). White Paper 2017 on Green Climate Technology

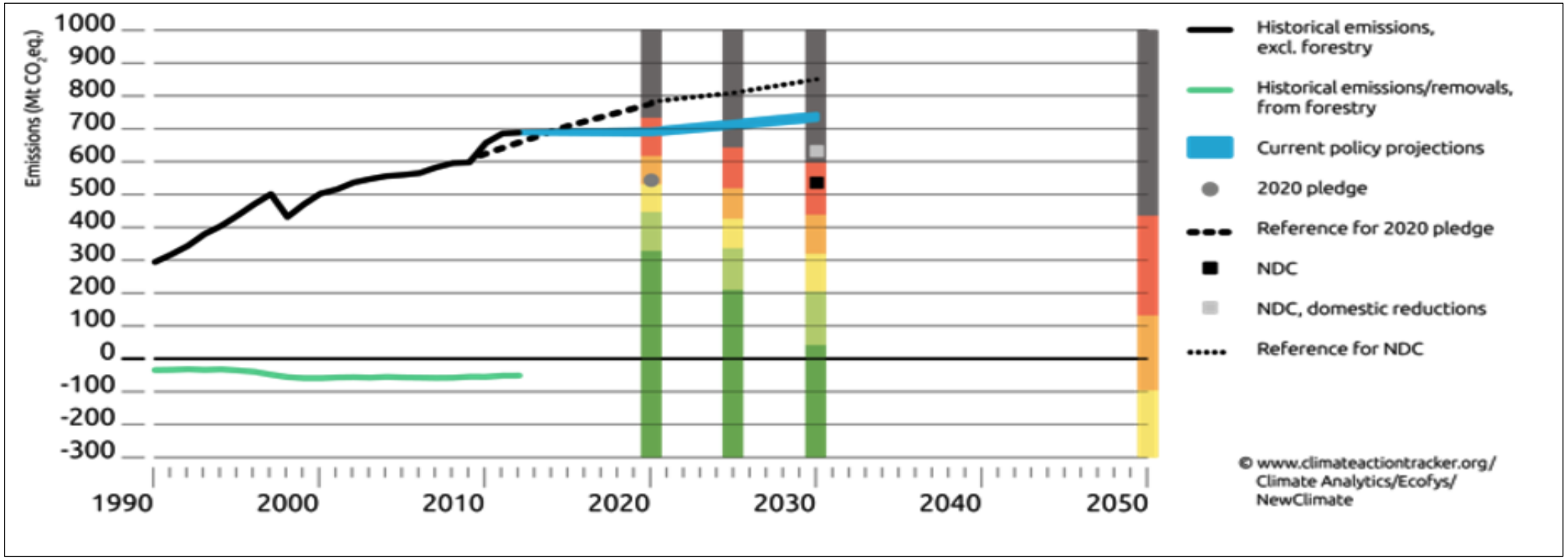
10 major Green Climate Technologies

Fields	Carbon Reduction		Carbon Resource Recycling	Climate Change Adaptation
Top 10 Major Tech.	Solar Cell	Fuel Cell	CO2 Mineralization	Common Platform Technology
	Biofuel	CCS	CO2 Conversion	
	Secondary Cell		By-Product Gas Conversion	
	Electrical Engineering, Information Technology			
50 Sub.	30 Sub. technologies		10 Sub. technologies	10 Sub. technologies

Response to Climate Change in Korea (1/2)

- Setting a goal of 37% reduction (25.7% in Korea, 11.3% in abroad) in GHG emissions from BAU levels by 2030

✓ Greenhouse gas emission trend (1990-2050)

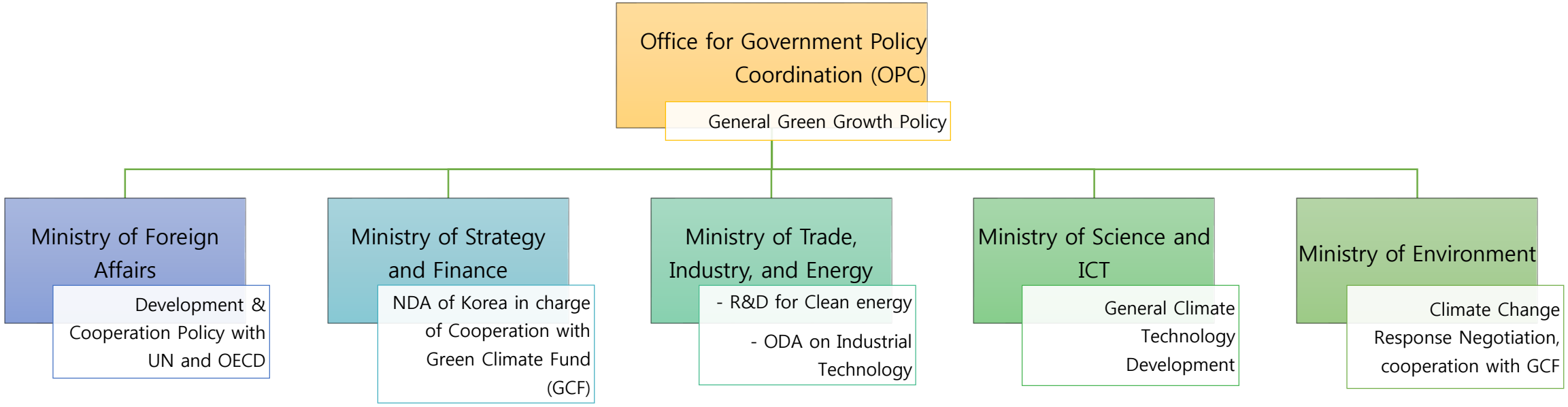


Source: http://climateactiontracker.org/countries/southkorea.html

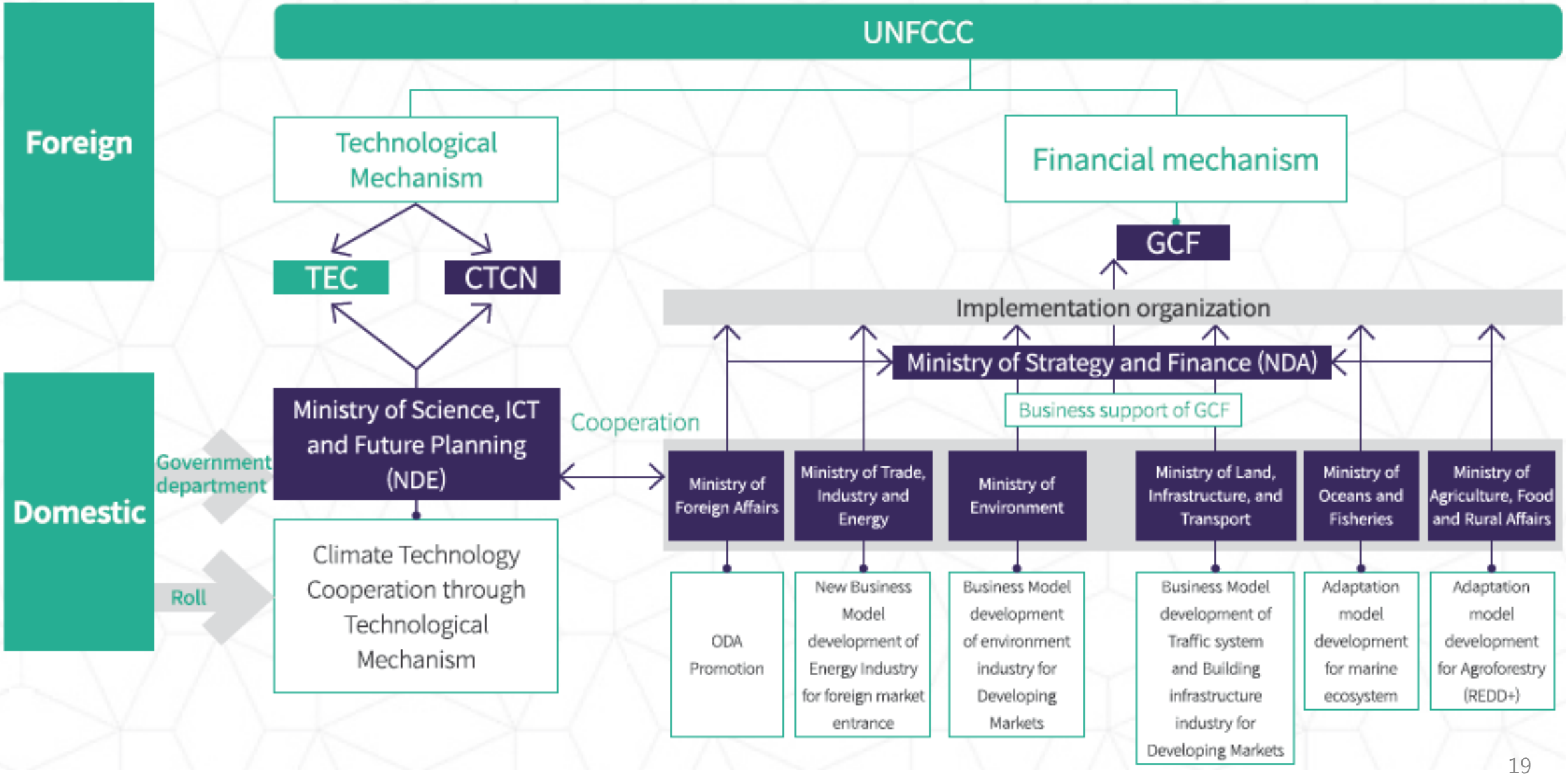
Response to Climate Change in Korea (2/2)

- Reviewing the implementation plan on GHG emission reduction through the development and transfer of Green Climate Technology

Climate Change Response from Major Departments of the Korean Government



Korean domestic response structure under UNFCCC



Source: GTC(2017). White Paper 2017 on Green Climate Technology

Recommendations

- South Korea green growth characteristics
  - ✓ Strong top-down leadership that elevated green growth
  - ✓ Substantial budget allocation for green growth

- The lessons include
  - ✓ The establishment process of the green technology strategy (government-driven)
  - ✓ The transferring process to green climate technology strategy to meet global standard
  - ✓ The building of infrastructure for green growth but still lack of tangible results