

GTC-K Introduction

- Strategy and Cases for Technology Transfer

Dr. Sang-Baek Chris Kang

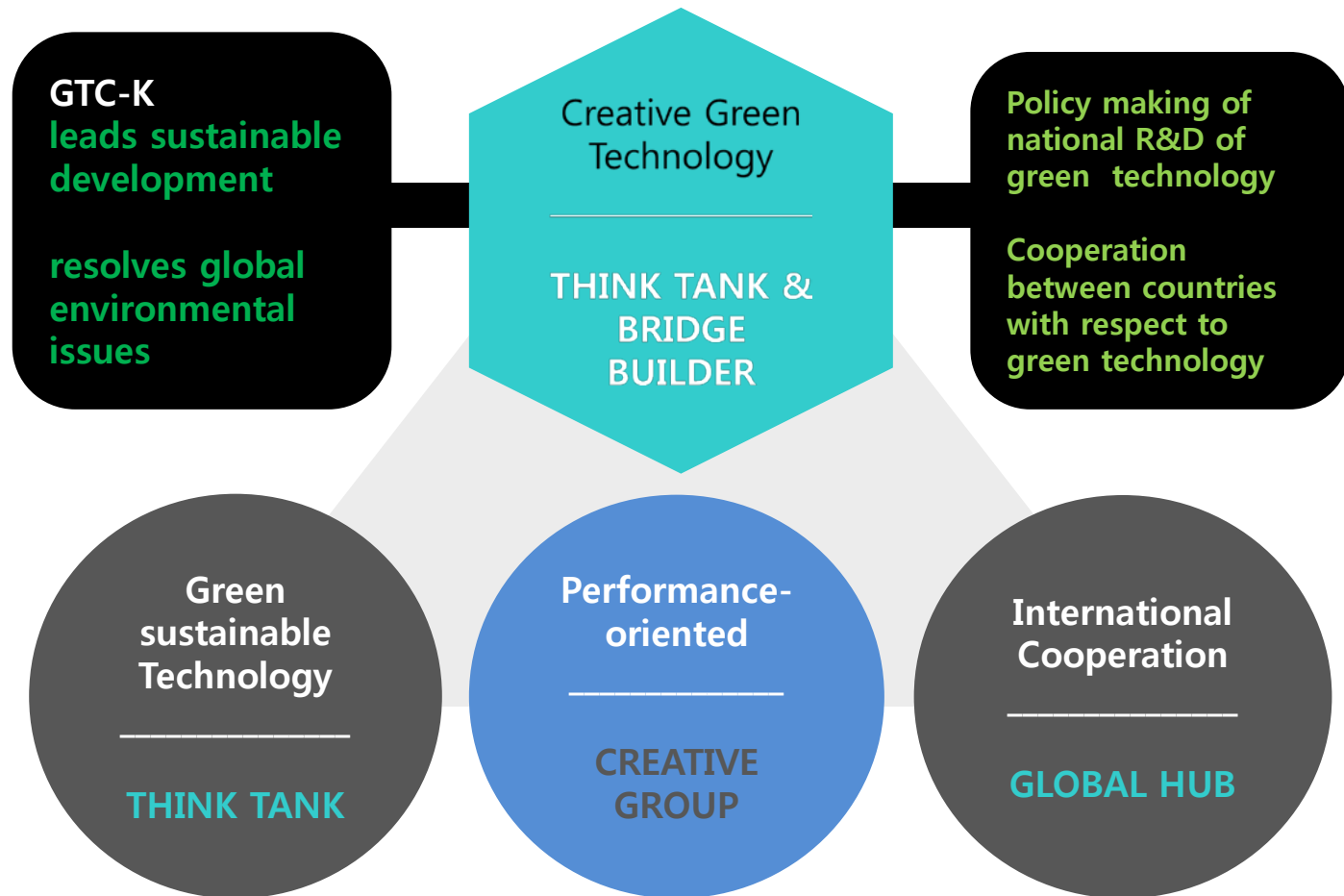
Director
Global Cooperation Division,
Green Technology Center-Korea
chriskang@gtck.re.kr





1. Introduction
2. Main Research Activities
3. Global Cooperation Activities
4. Action Plan: Target & Strategy
5. Ongoing Projects/Activities in 2014 (as of May)
6. Technology Transfer Case/Recommendation

1. Introduction – Vision and Mission

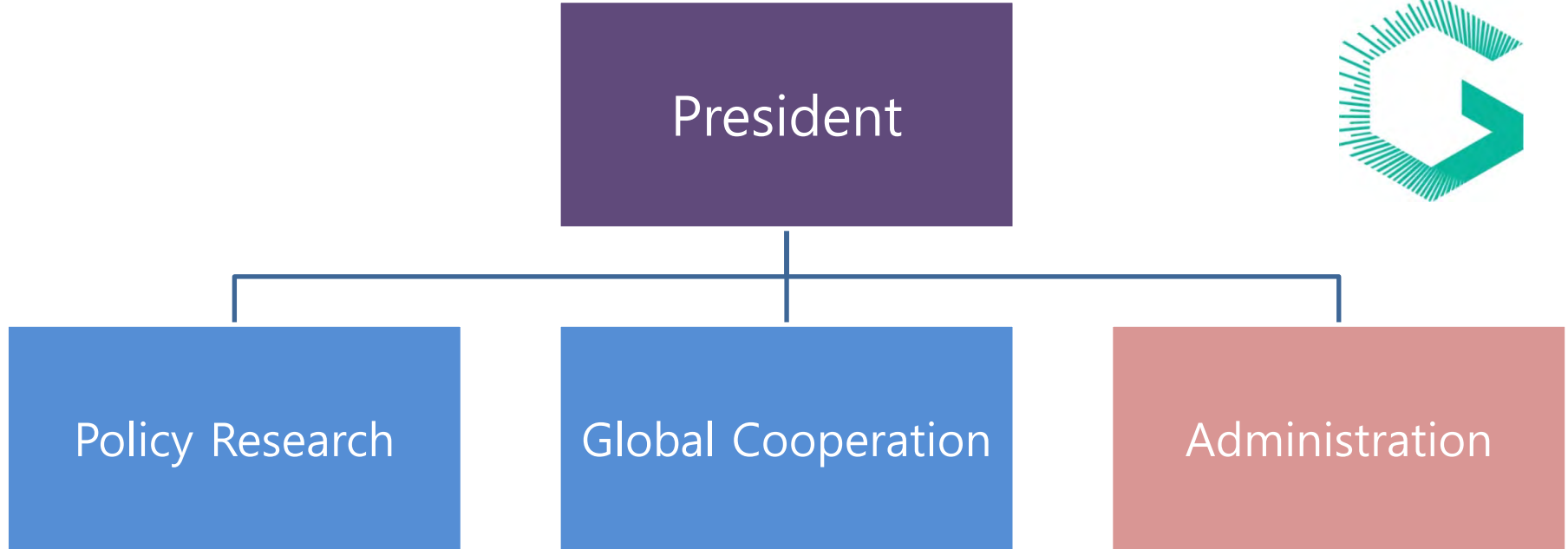


1. Introduction – Capability

- Over 50 persons
 - over 30 researchers / 15 administrative staffs
- Masters and Ph.D's
 - from worldwide renowned universities
- Regional experts
 - about USA, China, Japan, England, Germany etc.
- Interdisciplinary
 - Engineering, Administration(Business, Public),
Human/Social Sciences (Sociology, Journalism,
Linguistics etc.)
- Young and Dynamic
 - average age: around 30-35 y



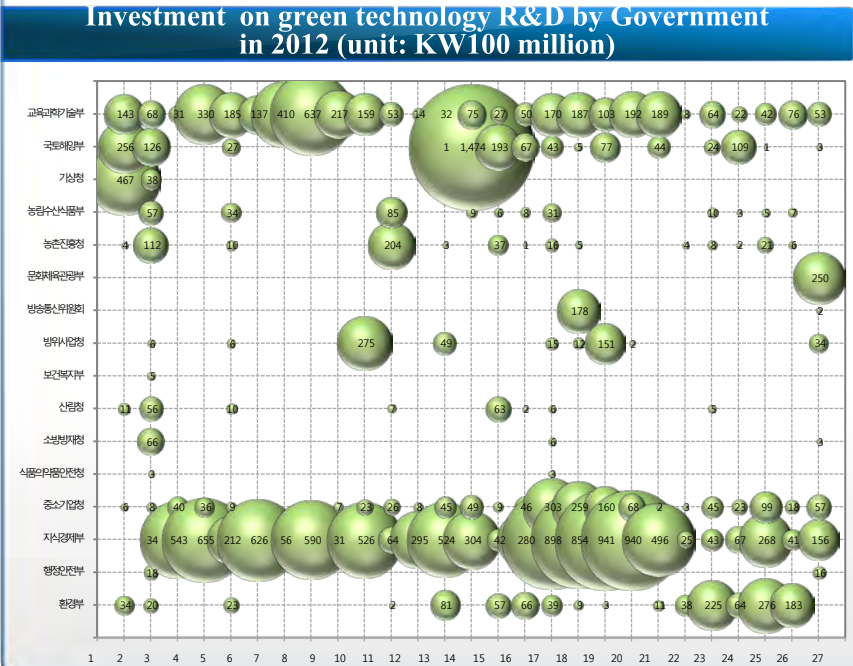
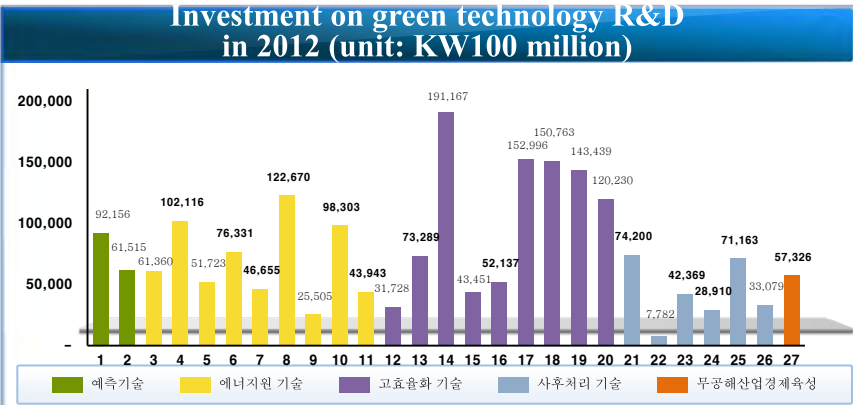
1. Introduction – Divisions and Functions



- **Policy Research Division**
Policy planning and establishment of green technology R&D
- **Global Cooperation Division**
Facilitating technology transfer to developing countries
Serving green triangle initiative with GGGI and GCF
Future Technology Trends Analysis
- **Administration Division**
GTC-K administrative and budgetary works

2. Main Research Activities

Analysis of national green technology R&D investment



2. Main Research Activities

Examples of GTC-K's publication



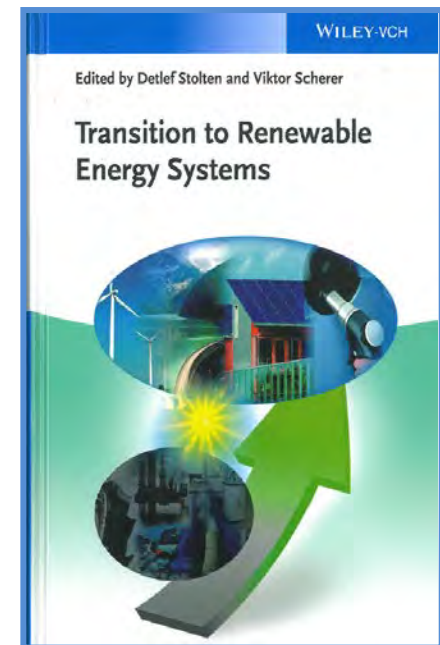
Green Tech Review focuses on providing insights for diverse green technology issues with tech trends and innovation



Green Tech R&D stats book provides up-to-date statistical data regarding green growth and R&D

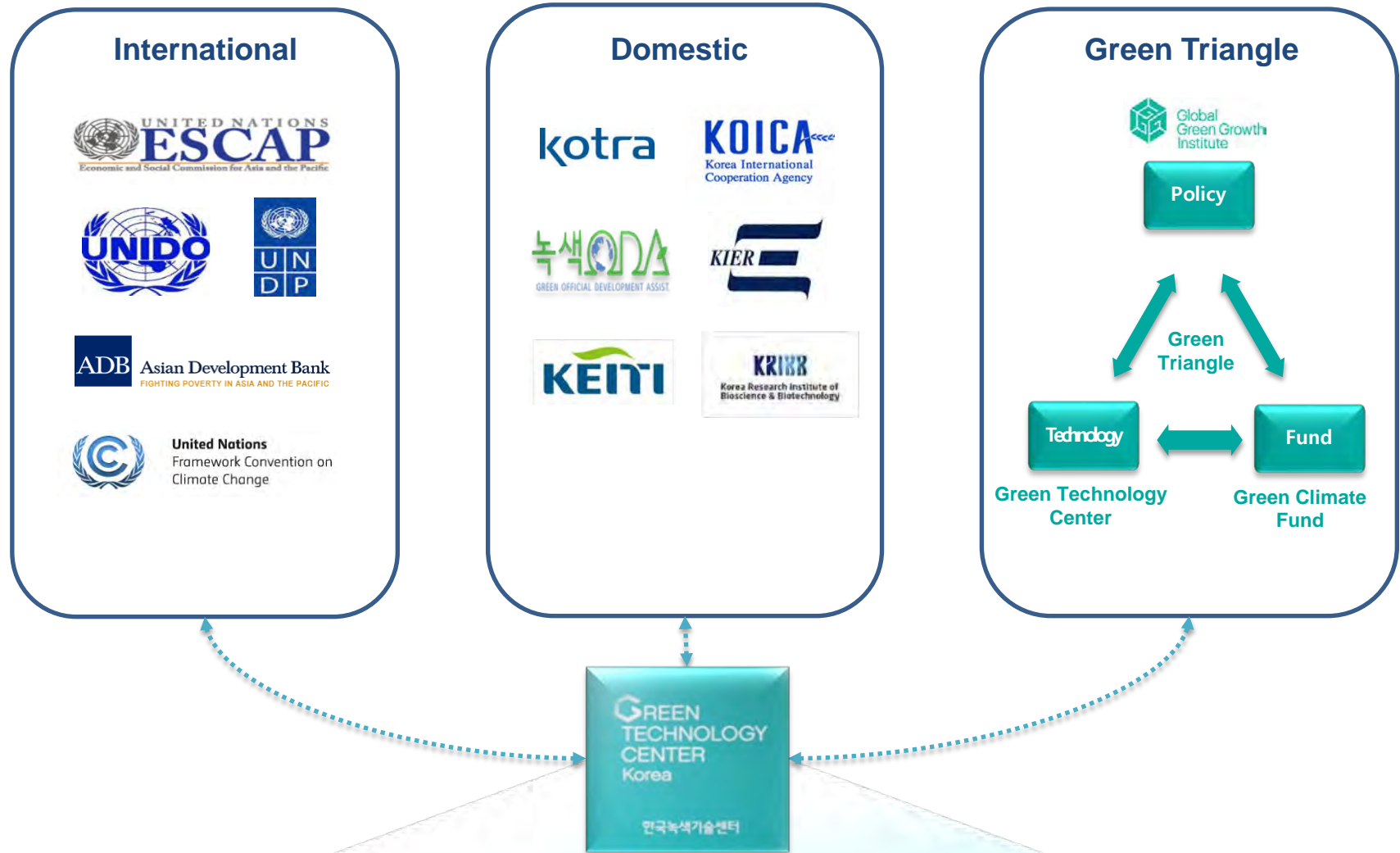


Green Tech In-depth Analysis offers in-depth analysis on green technology per se.



GTC-K provides case studies of Korea's green technology trends and status in international publication

3. Global Cooperation Activities: International Partners



Developed Country : Building a system for Green Technology Joint R&D
Developing Country : Strategic Partner for Green Technology Transfer and Diffusion

3. Global Cooperation Activities: Joint Workshop



GTC-UNDP Joint Workshop on Equitable Energy Access (WEEA)

- Date : 2013.04.30 ~2013.05.01
- Venue : *Lotte* Hotel, Seoul
- Organizer/Sponsor : **GTC**, UNDP/Ministry of Foreign Affairs
- Participants : 150 participants, including senior officials from 11 developing countries and UNDP Regional offices
- Purpose
 - To enhance understanding of energy development in Korea and other countries
 - To consult on effective knowledge sharing strategies for developing countries, as well as partnership opportunities in energy, policy making and implementation

3. Global Cooperation Activities: Training Program



GTC-UNDP Waste to Energy Training Program

- Date : 2013.11.25 ~ 11.30
- Venue : *Chulalongkorn* University, Bangkok, Thailand
- Organizer : **GTC**, UNDP APRC, *Chulalongkorn* University
- Participants : Experts from 7 East-South Asian countries
- Purpose
 - To enhance understanding of the needs for adaptive capacity of climate change
 - To expand research areas for each scholar/practitioner that entails waste-to-energy field for the developing countries
 - To construct a green partnership model through operating multilateral cooperation education program

3. Global Cooperation Activities: International Forum



Global Green Partnership Forum on Technology-Finance-Policy Strategic Plan

- Date: 2013. 12. 4 (Songdo, Incheon)
- Venue: Songdo Convensia, Incheon
- **GTC**, Incheon Metropolitan City, Ministry of Strategy and Finance (Hosts)
- Participants: 100 participants (Climate change experts etc.)
- Purpose:
 - Building green technology cooperation strategy and network for global green growth
 - Sharing of technology-finance-policy strategies for GCF's sustainable development

3. Global Cooperation Activities: Green Growth Knowledge Platform



Green Growth Knowledge Platform (GGKP)

- Initiative launched by GGGI, OECD, UNEP and WB

- Establishing a cross border platform for new partnerships and initiatives with institutions, agencies, and private companies related to green growth/green economy
- GTC-K was invited as an active member of GGKP Fiscal Instruments Research Committee Meeting

3. Global Cooperation Activities: Participation in UNFCCC meetings

- Ad Hoc Working Group on the Durban Platform for Enhanced Actions (ADP)
- Climate Technology Center and Network (CTCN)



2nd meeting of the Advisory Board to the CTCN

- Sep. 9-11, 2013 (Bonn, Germany)
- 20 members , 32 observers * GTC as observer
- Discussed on *Key message to the COP 19 in Warsaw* and *implementation of the results of Technology Needs Assessments (TNAs)*



3rd meeting of the Advisory Board to the CTCN

- Mar. 19-21, 2014 (Copenhagen, Denmark)
- 22 members , 30 observers * GTC as observer
- Discussed on *Cooperation with TEC and GEF*, *Activation of National Designated Entities (NDEs)* and *Planning Knowledge Platform*



2-4 ADP meeting

- Mar. 10-14, 2014 (Bonn, Germany)
- UNFCCC members / observers * GTC as observer
- Discussed on *establishment of a Single Contact Group* for common preparation on mitigation

3. Global Cooperation Activities: GGG Summit 2013

Presenting GTC-K's Initiative at GGG Summit 2013



4. Action Plan: Target & Strategy

Global Cooperation Framework

Implementation Phase

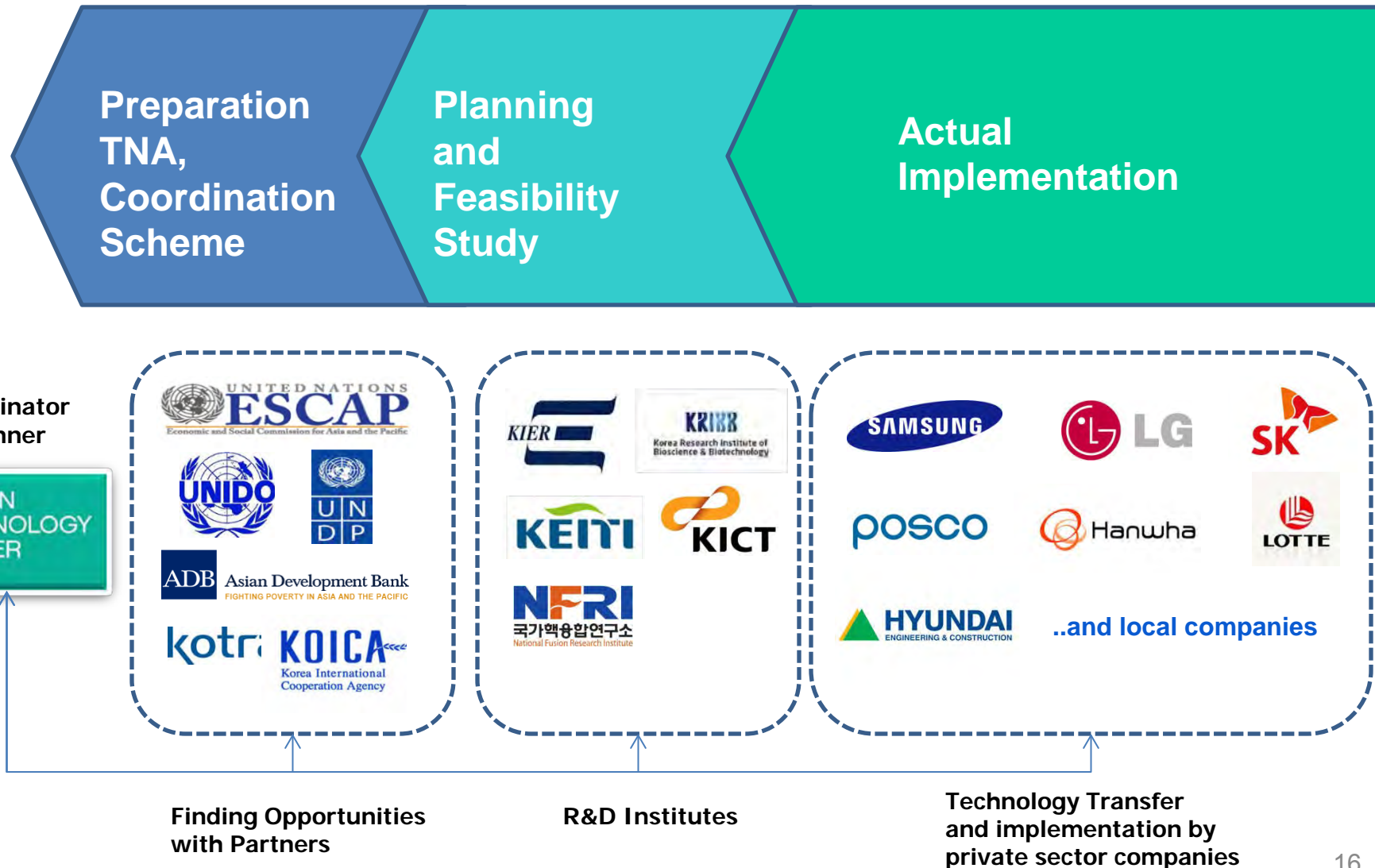
- Monitoring projects implementation with next step
 - Feedbacks
-
- ```
graph TD; PI[Project Identification] --> PP[Project Preparation]; PP --> IP[Implementation Planning]; IP --> PS[Project Start-up]; PS --> PE[Project Execution]; PE --> PSust[Project Sustainability]; PSust --> PI
```
- Actual implementation of the projects by private companies based on business planning
  - Facilitates implementation projects
  - Monitors and help solving issues

### Design Phase

- Mutual commitment with developing countries in advance and funding institutions regarding Mitigation/Adaptation of climate change technology implementation
  - Aligned with international institutions
- Pre-Feasibility Study and/or Master Planning of Policy
  - Line up with private consulting companies as well as funding organizations
- Feasibility Study and/or Business Planning
  - PPP action plan

# 4. Action Plan: Target & Strategy

## Technology Transfer to Developing Countries





## 5. Ongoing Projects/Activities 2014 (as of May) (1/2)



- **Waste to Energy (WTE) Feasibility Study in Vietnam**
- **Green/climate change technology quantitative Survey for developing countries**
- **UNDP Cooperation**
  - UNDP-GTC MOU constitution
  - Bioethanol Pre-Feasibility Study with UNDP with Nepal
  - Co-hosting annual workshop on equitable energy access
- **Feasibility study with Korean Research Institutes of Bioscience and Biotechnology “Exporting Sweet Potato to Turkmenistan”**
- **Co-hosting Technology Transfer International Seminar with UNESCAP**
- **Organizing a conference session with GGGI and GCF at Global Green Hub Korea 2014 “Green Triangle 2.0”**

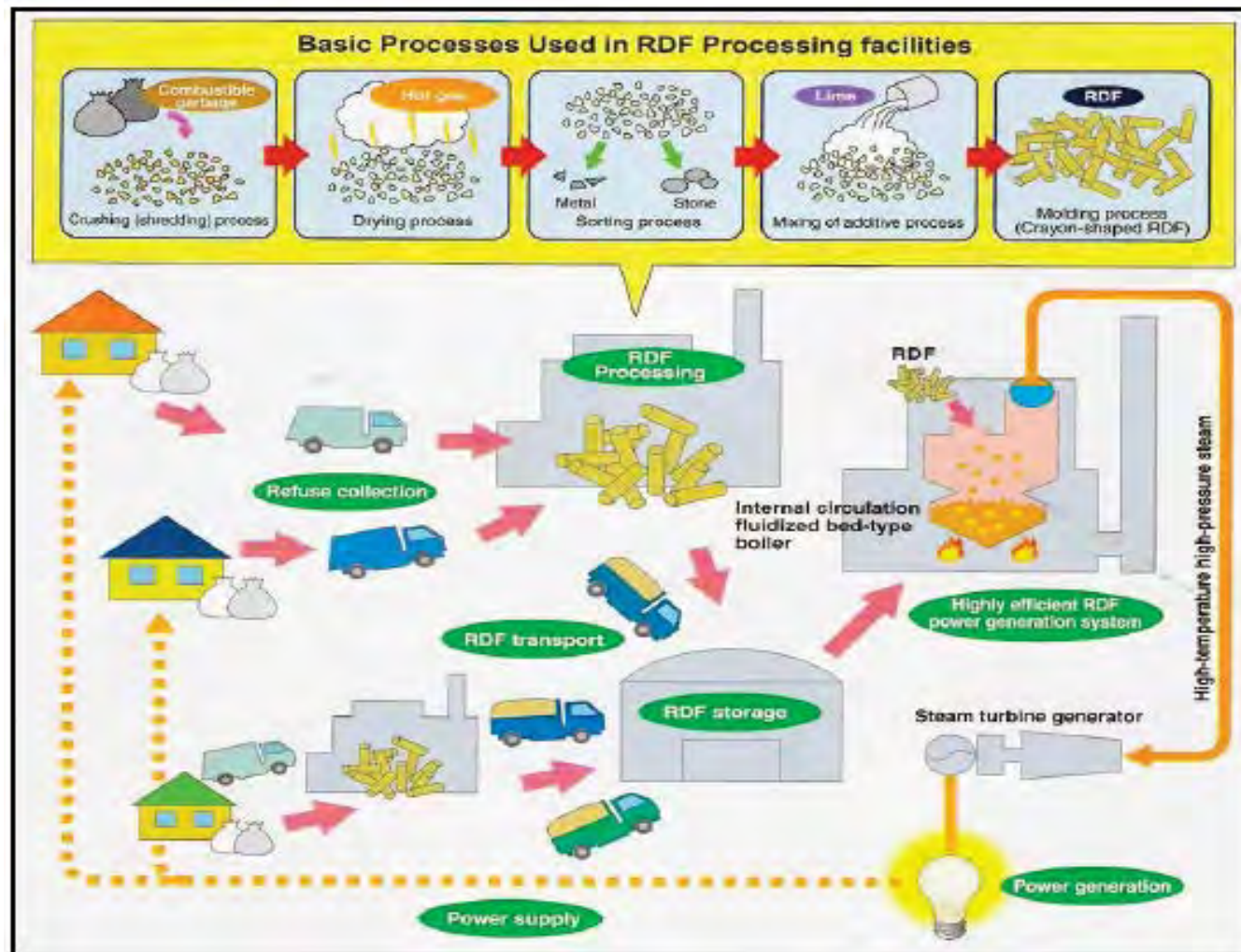
## 5. Ongoing Projects/Activities 2014 (as of May) (1/2)



- Eco-friendly city model platform with ICLEI (MOU)
- MOU with CITYNET
- MOU with KOICA “Operation of Platform for Korean Government Institutes”
- MOU with Wuppertal Institute in Germany – exchange of researchers and R&D process study
- Identifying preparation status and capabilities of Korean government R&D institutes for global technology transfer
- Public-Private-Partnership Program regarding Green/Climate Change Technology
- GIZ (Gesellschaft für Internationale Zusammenarbeit , German Society for International Cooperation) workshop (Ethiopia and Phillipine)

# 6. Technology Transfer Case/Recommendation

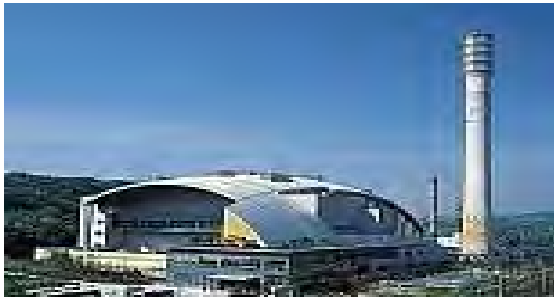
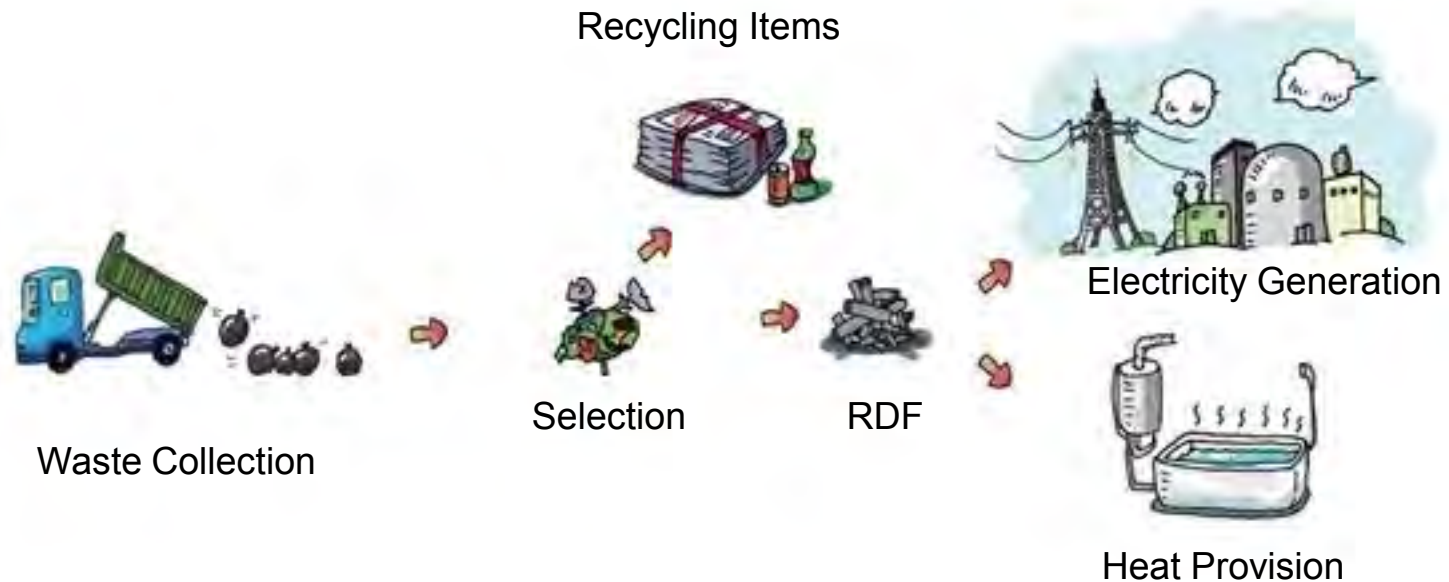
## Waste To Energy - Refuse Derived Fuel(RDF)\* over cogeneration



\* Sources: Korean Environment Management Agency (2009)

# 6. Technology Transfer Case/Recommendation

## Waste To Energy - Refuse Derived Fuel(RDF)\* over cogeneration



•Seoul Metropolitan Government: 180 Million Dollar Saving (1,300,000 Barrel equivalent) -> can provide 190,000 Household (15% of total apartment) (2010)

# 6. Technology Transfer Case/Recommendation

## Waste To Energy - Refuse Derived Fuel(RDF)\* over cogeneration

| Category                  |         | Size of the market (Million Dollar/Billion Dollar) |      |       |       |       | CAGR(%) |
|---------------------------|---------|----------------------------------------------------|------|-------|-------|-------|---------|
|                           |         | 2012                                               | 2013 | 2014  | 2015  | 2016  |         |
| Korea<br>(Million Dollar) | RDF     | 25                                                 | 28   | 31    | 36    | 41    | 13.2    |
|                           | RPF     | 80                                                 | 92   | 110   | 120   | 134   | 13.8    |
|                           | TDF     | 5                                                  | 5    | 6     | 6     | 7     | 10.0    |
|                           | WCF     | 20                                                 | 24   | 29    | 35    | 41    | 20.0    |
|                           | Mixture | 200                                                | 220  | 242   | 266   | 293   | 10.0    |
|                           | total   | 330                                                | 369  | 418   | 463   | 516   | 13.4    |
| World<br>(Billion Dollar) | RDF     | 10                                                 | 11   | 12.1  | 13.3  | 14.4  | 9.5     |
|                           | RPF     | 14.3                                               | 16   | 17.9  | 20    | 21.9  | 11.3    |
|                           | TDF     | 2                                                  | 2.2  | 2.4   | 2.7   | 2.9   | 10.0    |
|                           | WCF     | 8                                                  | 8.8  | 9.7   | 10.6  | 11.7  | 10.0    |
|                           | Mixture | 100                                                | 110  | 121   | 133   | 146   | 10.0    |
|                           | total   | 134.3                                              | 148  | 163.1 | 179.6 | 196.9 | 10.2    |

\*\* Sources: Korean Environment Management Agency (2009)

\* Different types of DF: RPF : Refuse Plastic Fuel, TDF : Tire-Derived Fuel, WCF : Wood Chip Fuel



## 6. Technology Transfer Case/Recommendation

### Waste To Energy – Bio-Methane from Polluted water



- **24,000 m<sup>3</sup> Bio Methane production per day**
- **2.5 Mw per day Electricity Generation**



# 6. Technology Transfer Case/Recommendation

## Remodeling Green Buildings – Demand Side Management



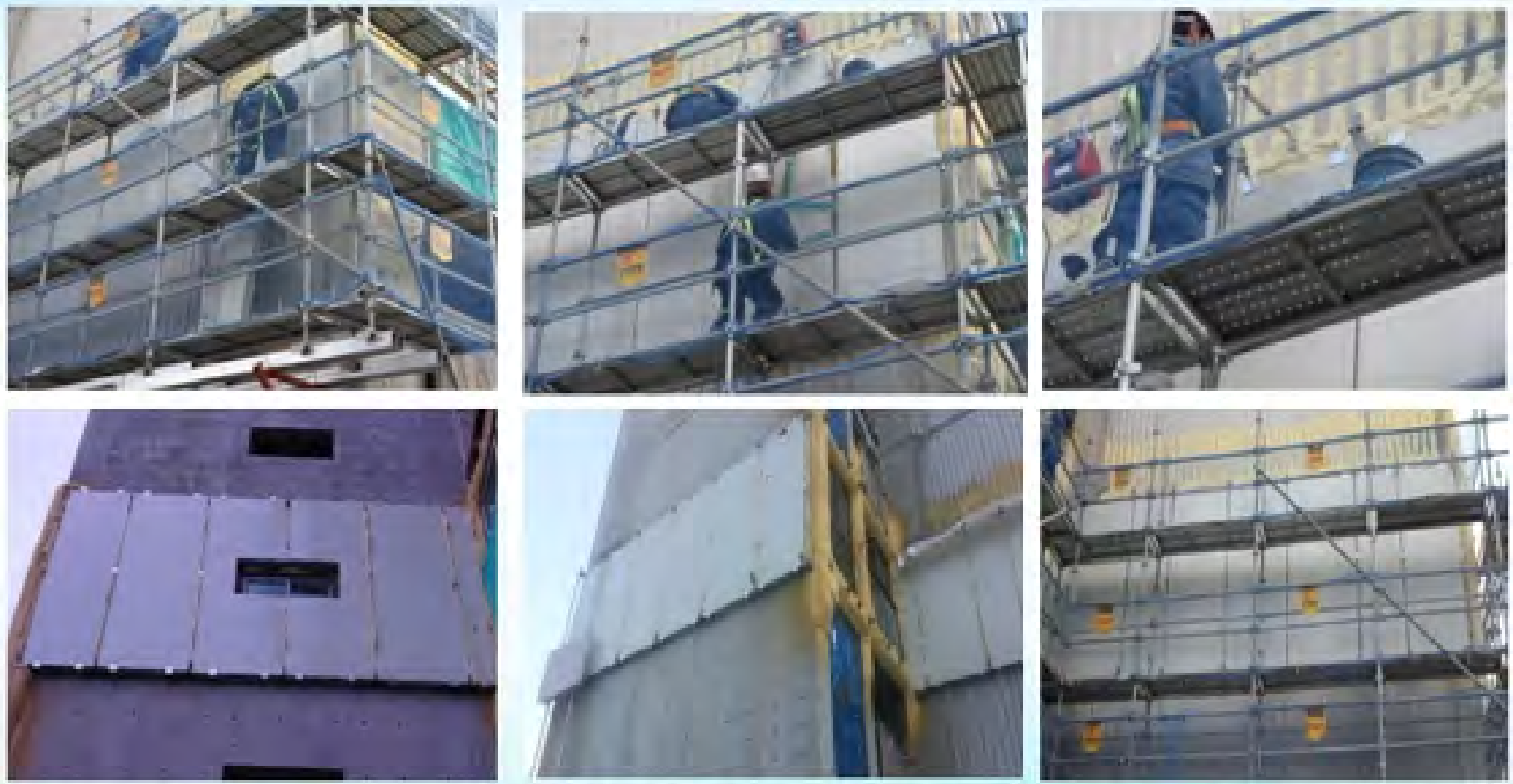
- **Average Payment for Thermal Protection per household: 3,000 dollars**
- **Savings per year : 500 Dollars**
- **Simple ROI : 5 years**
- **Price Increase of the Apartment: 300,000 Dollars**



•Chungdam Raeminan Apartment at Gangnam

## 6. Technology Transfer Case/Recommendation

### Remodeling Green Buildings – Demand Side Management



\* Sources: Korea Institute of Construction Technology (2014)



# 6. Technology Transfer Case/Recommendation

## Micro-grid to isolated areas (Gapa Island Case)



|                |                     |
|----------------|---------------------|
| Area           | 0.84km <sup>2</sup> |
| Time from Land | 20 Min              |
| Households     | 145                 |
| Population     | 275                 |

## 6. Technology Transfer Case/Recommendation



Sources: Song Jae Do (2013) Smart Grid for Energy Independency, Daekyung Engineering



# 6. Technology Transfer Case/Recommendation

- **Energy Generation : Renewable Energy 100% Replacement**
  - Now Diesel Generator of 300kW → Wind 500kW, Photovoltaic 63kW, ESS 2MW
- **Cars : All vehicles in Gapa island will be changed to EV's**
  - 4 Sedans, 2 Trucks, 3 Vans
- **Daily life Application : Pilot Case of Smart Grid**
  - Smart Meter (AMI, Advanced Metering Infrastructure) Deployment – Real-time billing
  - Total Energy Control and Management system – Energy, Security, Disaster Manager, and Water management, etc.
- **Organic Food without chemical fertilizer**
  - Organic vegetable and crops as area specific items
- **Smart water**
  - Fresh water, swage total management

## 6. Technology Transfer Case/Recommendation



**Gapa Island Wind Power Generation**



**Operation Center (TOC)**

Sources: Song Jae Do (2013) Smart Grid for Energy Independency, Daekyung Engineering

## 6. Technology Transfer Case/Recommendation



**ESS (Energy Storage System)**



**Photovoltaic Power Generation**



# Thank You!

Dr. Sang-Baek Chris Kang

Director  
Global Cooperation Division,  
Green Technology Center-Korea  
[chriskang@gtck.re.kr](mailto:chriskang@gtck.re.kr)

