STI for SDGs with special focus on Energy and Citizen’s involvement

2017. 11.

Dr. Woosung Lee, Research Fellow

(Science and Technology Policy Institute)
1. SDG Targets Related to STI

Targets on STI International Cooperation

Targets on utilization of technologies for the implementation of SDGs

Target 1.4, 2.a

Target 4.b, 5.b

Target 7.a, 7.b, 9.b, 9.c, 14.a

Target 17.6, 17.7, 17.8

자료: 저자정리
2. Climate Tech Gap

자료: 저자정리
3. Global Climate Initiatives

Energy related initiatives: 14% of total climate initiatives in number of projects

Source: Analyzed around 200 climate initiatives on UNEP’s Climate Initiatives Platform (2016)
4. Korean CTCN Network Members

47 Korean network members out of 389 in total

As of November 2017
### 5. Korea Energy Technology

#### 1. Microgrid Design & Analysis - KIER

- **Issues of power systems rely on the centralized electrical grid**
  - Interruption of power supply can be occurred by natural disasters
  - Potential power outages due to the supply-demand imbalance

- **High reliability microgrid design technology**
  - Renewable energy penetration ratio enhancement technology
  - Frequency and voltage control technology / Outage time reduction technology
  - Distributed power generation capacity design and analysis technology

#### 2. Solar Thermal Desalination - KIER

- **Eco-friendly desalination technology without greenhouse gas emissions since no fossil fuels are used**
  - Solar desalination technology with low operating cost and easy maintenance owing to simultaneous production of hot water (solar thermal) for evaporation and electricity (photovoltaic) for pumps from sun
  - Applying a MEMS (Multi Effect Multi Stage) distiller optimized for solar desalination process
  - Potential for utilization of heat energy (approx. 70°C water) produced by waste and biomass combustion

#### 3. Low Cost Micro Solar Desalination - ETRI

- **Multi effect solar still (MES)**
  - Normal solar still wastes the latent heat of water vapor, for single usage. However, MES recycles the latent heat repeatedly by multi-layered evaporating/condensing stacks. Therefore, it can distillate saline water more effectively. MES has been known and studied since half centuries ago. Its productivity was both theoretically and experimentally proven to be 10~20 liter/m² per day. However, it has been scarcely used for practical water source, due to relatively high cost
  - Contrast to the previous MES, by replacing expensive metal plates in existing MES to roll to roll processable plastic film, new technology could reduce its cost and weight very much. Newly designed structure of the evaporation/condensation layers and spacers between the layers enabled the system stable without using heavy materials

#### 4. Onshore Lanstallable WEC Solution for Less Populated and Costal Areas - INGINE INC

- **Multi-Directional PTO (Power Take Off) Technology**
  - INWave’s underlining technological novelty is embedded in its energy harvesting dynamics. It is a three-dimensional flexibility of INWave’s WEC’s energy absorbing unit that allows it to reciprocate with all on-coming wave motions and thus maximize production of electricity.
  - Significantly more economically efficient even in small scale by comparison with more conventional technologies, which are limited to a uni-directional movement.

#### 5. Stand-alone Off-grid Photovoltaic

- **Design and operation techniques of high performance off-grid PV system**
- **Construction of hybrid power system using PV and renewable power sources and energy storage**
  - Design of optimized off-grid PV systems for environmental conditions of installed areas
  - Continuous power supply using energy storage system
  - Hybrid PV power system using renewable energy sources (ex. wind power)

#### 6. The Photovoltaic Power Generation and Water Purification System

- **Solar Puri System**
  - The micro-grid electricity and drinking water supply system utilizing water resources and solar power to serve 30~50 families. (Dimension: 12m(L) x 6.3m(W) x 3.5m(H))
AU-ROK STI Workshop 2017

“Africa-Korea STI Cooperation, achieving SDGs for the Future”

- Date: 25-27 April, 2017
- Venue: African Union Commissions Conference Complex, Addis Ababa, Ethiopia
- 80 participants (AU, RoK, Korea Ethiopia Embassy, Research Institutes etc)
- 12 Invited STI researchers from AU member states (9 countries)
- Developed 12 Project Concept Papers on different fields of STI
7. ROK-UNDP 2 Phase Program

I. Platform Project
- Setting-up development experience case studied
- Compiling Innovation Strategy
- Sharing Innovative Knowledge

II. Consortium Project
Solution to holistic approach to the economy through Science, Technology and ICT Sectors are as below

III. Scaling-up Project
Extend the development impact of a project that has been implemented in Phase 1 to several Asia-Pacific countries
- Electron Beam Application to Value Addition

Program Coordination
Achievement Management
M&E Methodology upgrading Innovation demand

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Program Coordination
Achievement Management
What is Inno-Code 2017?
- "Inno" refers to "Innovation" while "CoDe" refers to "Co-development."

Purpose
- To establish support mechanism such as mentorship and nurture STI knowledge
- To foster mutual understanding among the future generations of ASEAN and ROK (APASTI 2016-2025 Action 3.1~3.2)

ASEAN-ROK Vision Innovation Competition: Inno Code 2017: Achieving the SDGs Together
- Topic: What are some negative impacts of climate change in local communities of ASEAN? What are some innovative solutions to address those issues?
- Who: ASEAN-ROK Undergraduate/Post graduate (Under 30)

When & Where
- July 2017 / Siem Reap, Cambodia

Competitors: 11 team
- ROK, Vietnam, Lao, Philippine, Singapore, Cambodia, Thailand, Indonesia

Process
- DAY 1: Cultural Exchange, Team work
- DAY 2: Collaborative research, Mentoring
- DAY 3: Presentation and Award Ceremony

Sectors of Suggested proposal
- Cambodia: Animal Protection, Bio-Sand (Toilet)
- Lao PDR: Solar Energy, Micro Plastic
- Philippine: Recyclable Energy, Waste management
- Singapore: Bio-Sand (Toilet)
- Vietnam: Electricity, Micro Plastic
- Thailand: Flooding, Water
- Indonesia: Forest Fire, Drought
- ROK 1: Forest Fire
- ROK 2: Water
- ROK 3: Forest Fire
- ROK 4: Drought
9. Project outcomes – (3) Raising public awareness

01 7th Creative Design Contest

- Purpose: To develop and disseminate appropriate technology to marginalized people (The other 90%)
- Date / Venue: May 22, 2015 (Fri), Seoul National University
- Activities: 340 undergraduate/graduate students (75 teams) attended, 20 teams awarded through evaluation
  (1st: oral presentation, 2nd: exhibition)

<table>
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<tr>
<th>Prize</th>
<th>Provider</th>
<th>Universities, team, (name of invention)</th>
</tr>
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<tbody>
<tr>
<td>1st</td>
<td>Minister of MSIP</td>
<td>Gyeongsang Univ, 'Pharmglory', (Life Heat Source)</td>
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<tr>
<td>2nd</td>
<td>President of NRF</td>
<td>Inha Univ, 'Tapio Clinic', (preventing epidemics: Tapiotizer)</td>
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<td></td>
<td>President of Sanhak Foundation</td>
<td>KAIST, 'KAIDEA', (Braille Printer for blind people)</td>
</tr>
<tr>
<td>3rd</td>
<td>President of UNITEF</td>
<td>Kangwon Univ, 'Wisdom of Columbus',</td>
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10. Korean S&T Innovation Centers

S&T Innovation Centers

2013. 07
Phnom Penh, Cambodia

2014. 07
Luang Prabang, Laos

2015. 07
Pokhara, Nepal

Africa (No centers in operation)
Target countries: Nigeria, Ethiopia, Uganda, Cameroon, Kenya, Tanzania, DR Congo

Asia (currently, 3 centers in operation)
Target countries: Cambodia, Laos, Nepal, Mongolia, Myanmar, Bangladesh, Vietnam, Indonesia, Philippines
11. Project outcomes – (2) S&T Innovation Centers

Cambodia: Innovative Water Center
- Research area
  - De-watering the polluted drinking water (arsenic and metals, organic matter)
  - Cost-efficient pumps and de-watering facilities by using new renewable energy
- Implementing Organization
  - Scientists Without Borders

Laos: Sustainable Energy and Agriculture Center
- Research area
  - Self-generating energy through indigenous plants & agricultural byproducts
  - Producing agricultural processed goods by establishing small enterprises based on villages
- Implementing Organization
  - Sharing and Technologies Incorporated

Nepal: Innovation Technology & Entrepreneurship Center
- Research area
  - Developing New renewable energy
  - Developing agricultural appropriate technology
  - Organizing appropriate technology training for young entrepreneurs based on technology
- Implementing Organization
  - Handong University
End of Document

Dr. Woosung Lee
Research Fellow
Global Policy Research Center
Science and Technology Policy Institute
82-10-9068-2803
leews@stepi.re.kr