The Japan-ASEAN Science, Technology and Innovation Platform: Promotion of Sustainable Development Research (JASTIP) will promote research toward sustainable development based on an inclusive Japan-ASEAN collaboration and aim to build a platform for Japan-ASEAN science and technology cooperation.

WP2: Energy and Environment Joint Laboratory in NSTDA, Thailand

by: Assoc. Prof. Dr. Thumrongrut Mungcharoen
Senior Advisor, NSTDA
Japan-ASEAN Science, Technology and Innovation Platform

JASTIP supported by JST takes a role as Research Hubs, World-wide Network in ASEAN region.

**JASTIP Vision**

JASTIP will be catalyst to explore new horizons in Science Technology innovation through *all-ASEAN* and *All-Japan* relationship based on En (縁: Connectedness) and Wa (和: Harmonious human relationships and networks), aiming to enrich ASEAN’s potential and to pursue SDG’s research promotion.

**JASTIP Goals**

- Establishing platform for Japan-ASEAN collaboration of science, technology and innovation toward SDGs goal.
- Promoting transdisciplinary researches and enhancing human development including non-academic stakeholders.
JASTIP-WP2 implementation: Thai PI (together with Japanese Co-PI) phase 1 (2015-2020)

**Biomass to Energy and Chemicals (B2EC)**

**Project 1** - Development of Carbons from Biomass for Energy Storage Applications (MTEC- Kyoto U)

*PI:* Dr. Sumitra C., MTEC (+Prof. Takeshi Abe)

**Project 2** - Innovations in Biomass Application for Catalytic Material Synthesis and Energy Devices (NANOTEC-CU-KU-Vistec-Kyoto U) [PTT, etc.]

*PI:* Dr. Kajornsak F., NANOTEC (+Prof. Noriaki Sano)

**Project 3** - Innovations for Conversion of Biomass to High Value Chemicals by Photocatalytic Process (BIOTEC-Kyoto U-JGSEE) [Mitr Phol, Showa]

*PI:* Dr. Verawat C., BIOTEC (+Prof. Takeshi Sagawa) (worked closely with WP3)
Research Themes:
1. Rural Electrification by Renewable Energy
2. Implementation of Renewable Energy in the ASEAN region
3. Energy Development in the ASEAN region
4. Rural/Community Renewable Energy
5. Development of Renewable Energy Technology adapted to the ASEAN region

Social Implementation:
- Practical application of Synthesize of Carbon Nanotube from Exhaust Gas (PTT) and TiO2 coating (MTEC)
- PATENT application: Xylitol conversion by photo-catalysis (KU-BIOTEC- JGSEE/KMUTT)
- Policy Assessment to Ministry of Energy, Thailand
- Advice on “Renewable Energy Policy” in Myanmar
- Contribution to SDGs by PV installation in University of Yangon, Myanmar (Kyocera AP) and Renewable Energy Implementation in Rural Community

Contribution to SDGs:
- Biofuel Development (Goal 7,11,13)
- Renewable Energy Policy in Myanmar (Goal 7,11,13)
- The outcomes of research on “Community Renewable Energy” were reported to Ministry of Energy in Thailand (Goal 1,5,6,7,8,10,11)
- Rural Electrification Project in Sarawak, Malaysia; Myanmar; Cambodia (Goal 1,3,4,5,7,8,10)
Cooperation with

- **SATERPS** “Development of Clean and Efficient Utilization of Low Rank Coal and Biomass by Solvent Treatment”
  => **extension to the neighboring countries in JASTIP (Laos, Myanmar)**
- **The e-ASIA JRP** International Workshop 2016 and follow-up activity
  => Proposal has submitted in e-Asia

Cooperation with Industries

- Many collaboration researches are running at NSTDA related labs.
- Sub-satellite lab in KMITL has been opened to industry and the other research institute.

Step forward to JASTIP WP2 phase 2

- Letter of Intent (NSTDA- Kyoto U)
- Memorandum of Cooperation (KU, Japan/ JST, Japan/ LIPI, Indonesia/ MJIIT, Malaysia/ NSTDA, Thailand)
- Collaborative Research Agreement (NSTDA-Kyoto U)
- WP2 office at NSTDA-Thailand Science Park
4th JASTIP Symposium “Biomass to Energy, Chemicals and Function Martials” (2017, NSTDA)

Supported by AUN/Seed-Net, JST, JSPS, MEXT NEDO and SIP program of Cabinet Office, Government of Japan, 23 private companies

>250 participants, 18 booths from private companies and funding agencies
Some points of self-assessment (WP2-Phase 1: 2015-2020)

Positive Issues
- JASTIP succeeded in producing the scientific outputs through new collaborations at Joint Lab.
- JASTIP has enabled not only Japan-ASEAN collaboration but also intra-ASEAN, such as NSTDA-LIPI.
- JASTIP has activated interdisciplinary collaboration on challenging issues, i.e., biomass utilization.
- Through JASTIP-Net, new partners and new research themes across the ASEAN were explored.
- JASTIP contributed to develop the next-gen researchers through joint research activities, short-term exchange program and education in the graduate schools in Japan.
- JASTIP build a momentum to start a double degree program among NSTDA, KMUTT and Kyoto University, which is expected to have a new opportunity for human resources development.
- JASTIP Symposia could provide opportunities for multiple stakeholders to meet together and to facilitate the new collaboration with the private sector and policy-makers.

Challenging Issues
- The approved budget could not allow JASTIP to deploy the senior-level researchers, who could lead the joint research at the Joint Laboratories over the long term.
- Due to the budget constraint, we did not dare to take a “selection and concentration strategy” to deepen research on selected themes.
- There is a criticism that JASTIP still remains Kyoto University-centered platform on Japan side.
- Joint Laboratories are expected to function as a hub in the country as well as for the region, but there was only few cases for other countries researchers to use the Joint Laboratories.
- JASTIP core members needs to shift to the younger generations in the coming years.
- JASTIP, a research-based platform, needs to explore the strong partnership on commercialization.
Transition from 1st phase basic CR labs to “Social implementation”

- **Main CR lab.** NSTDA, TSP, Pathum Thani, Thailand
  “Biomass to Energy and Chemicals project” at NSTDA (4 national centers: BIOTEC, MTEC, NANOTEC, ENTEC)
- **Sub-CR labs.**
  - King Mongkut’s Institute of Technology, Nano Center (MTEC), Thailand
    - Photocatalysis
  - JGSEE/KMUTT Bangkhuntien Campus, Biomass Combustion Lab
    - SATREPS “Solvent Extraction”
  - National University of Laos, Chemical Analysis Lab.
    - Extension of SATREPS “Solvent Extraction”, e-Asia JRP (+ WP3)
      may extend to the other countries

→ Other funding sources: e-ASIA, JAIF (Japan-ASEAN Integration Fund), etc.
2020
- Matching with non-academic partner
- R&D phase
- Biomass Utilization (EFB, ST)
- Implementation study on solar farm
- Design of photo-bio reactor
- Development of bio-fuel process
- Synthesis of Carbon material
- Implementation of Photo-Bio Reactor
- Implementation of Solar-Farm
- Policy Recommendation of Rural Electrification

2021
- Dialogue with ASEAN
- ACE
- JSPS
- UNESCO
- NEDO
- JICA
- ADB
- Matching with non-academic partner
- Collaboration Study
- Human Resource Development
- Human Resource Development
- R&D with industries
- Implementation
- Implementation
- World wide cooperation

2022
- Implementation phase
- Mass production of Eco-Activated Carbon
- Rural Electrification in ASEAN
- Design of photo-bio reactor
- Development of bio-fuel process
- Synthesis of Carbon material

2023
- Technology Transfer
- ERIA
- UNIDO
- Policy
- World wide cooperation

2024
- Challenging target
- Establish of ASEAN-JAPAN Energy Research Center
- Forming ASEAN-JAPAN Academic Society

Platform forming

Strengthening and establishing the Japan-ASEAN Science and Technology Cooperation Platform toward achievement of SDGs
### NSTDA Research Fellow for ASEAN

(Thailand initiative for JASTIP)

#### Overview

- Build up R&D capability
- Foster the research network
- On-the-job and research-based program
- 10-15 scholarships for two types: 3 months and 6 months

#### Research topics

- Agricultural, Food and Biological Sciences
- Health and Medicine
- Energy
- Innovation
- ICT/IT
- Nanotechnology
- Environmental Science
- Materials Science and Engineering

#### Eligibility

1. The applicants must be scientists currently being employed in either a public or private academic institute, OR a governmental research.

2. The applicants must have good command of English and must not be older than 40 years old.

3. Applicants will have to select only ONE course on the application form.

4. The applicants must hold at least a Bachelor’s degree in sciences for application for a fundamental course and at least a Master’s degree in sciences for application for an advanced course.

5. The applicants must show on his/her application form that his/her current job involves research, not administrative work.

### List of Eligible Countries

Cambodia Laos Myanmar Vietnam Indonesia Philippines Malaysia Brunei Singapore
NSTDA Existing Collaboration Platforms on Energy & Environment in ASEAN
BCG Economy Model in Thailand (+ASEAN) → can collaborate via JASTIP platform

Ongoing studies

• SCP Framework for ASEAN (Nov 20-July 21)..
  UNEP, EU Switch-Asia & APRSCP

  ASEAN SCP + BCG Policy Framework/
  Roadmap towards BCG economy

• Circular Economy for Plastics in ASEAN
  (collaboration framework, since 2019).... (WB, UNEP, EU)

• ASEAN Circular Economy Roadmap
  (Jul 2020-Aug 2021).... ERIA

• ASEAN BCG Network (Bio-Circular-Green economy)
  (proposed since Q4, 2020).... Thailand

BCG Economy Model:
Thailand National Agenda
(2021-2027)
Thank You for your kind attention

National Science and Technology Development Agency (NSTDA)