

# ASEAN Cooperation: Facilitating Involvement of Academe and Industry Players in Accelerating Renewable Energy Penetration

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*ASEAN Smart Grid Congress 2019 (ASGC5): Industry Engagement Towards Low Carbon Path*  
*3 December 2019, Johor Bahru*



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# Southeast Asia's Energy Transition



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## ASEAN Economic Community 2025 (AEC)

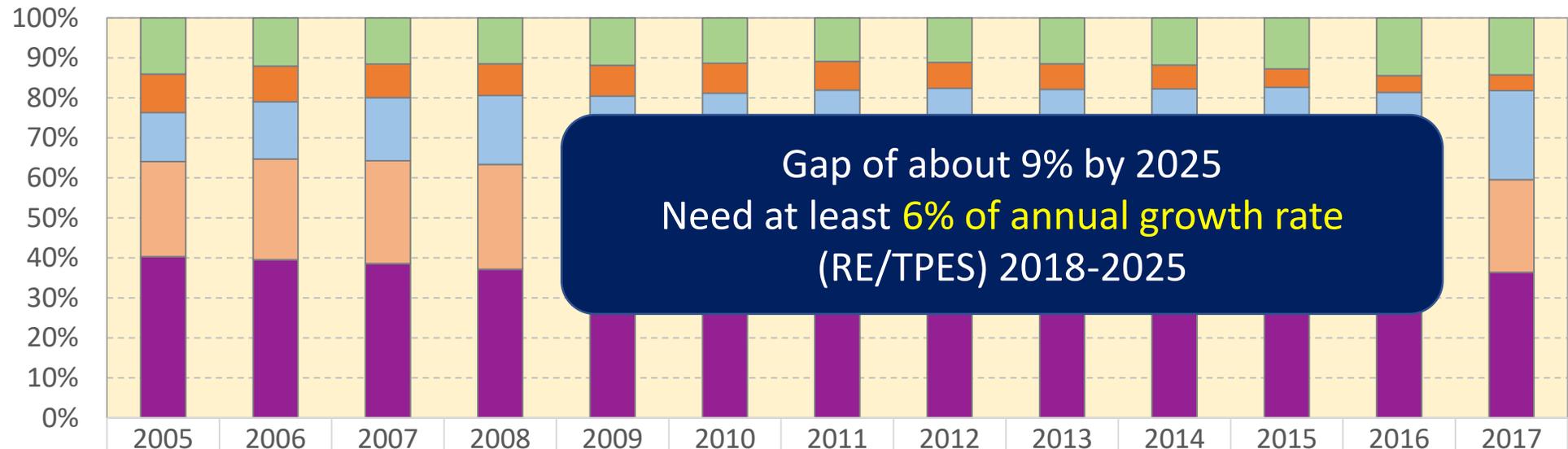
- Element of B8. Sustainable Economic Development:
  - Objective: To promote green development by developing a sustainable growth agenda that promotes the use of **clean energy** and related technologies, including **renewable energy** through green technology, as well as enhances sustainable consumption and production.
- Element of C4. Energy: ASEAN Plan of Action for Energy Cooperation (APAEC) 2016-2025
  - Objective: To enhance energy connectivity and market integration in ASEAN to achieve **energy security, accessibility, affordability and sustainability** for all.
  - RE aspirational target: 23% of RE in the ASEAN Total Primary Energy Supply (TPES) by 2025
  - EE target: Reduce energy intensity in ASEAN based on 2005 level: 20% by 2020 & 30% by 2025
- The theme of 37th ASEAN Ministers On Energy Meeting “**Advancing Energy Transition through Partnership and Innovation**” – Sep 2019

# Progress of ASEAN's RE Targets



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## Shares of Fuels in TPES



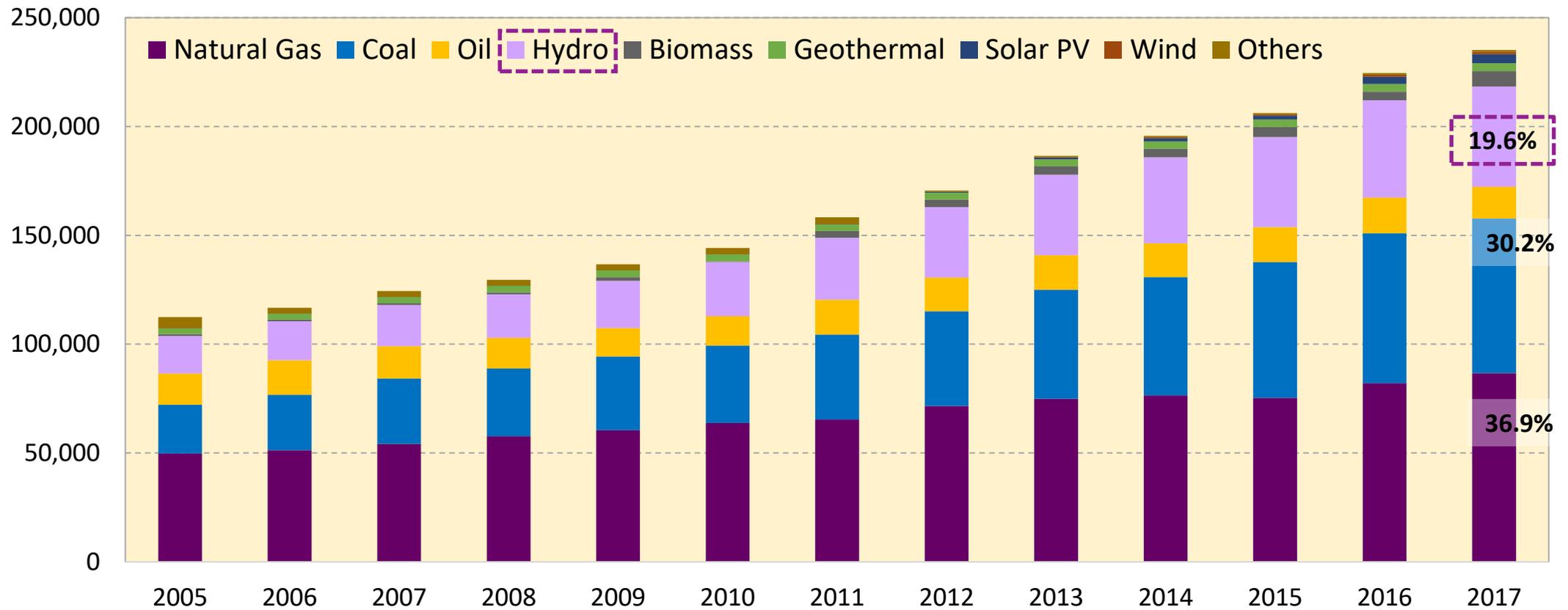
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Renewable Energy	14.1%	12.0%	11.5%	11.5%	11.8%	11.4%	10.9%	11.2%	11.5%	11.8%	12.7%	14.4%	14.3%
Others	9.6%	8.9%	8.4%	8.0%	7.7%	7.5%	7.1%	6.5%	6.4%	6.0%	4.6%	4.2%	3.9%
Coal	12.3%	14.3%	15.8%	17.2%	16.0%	17.7%	18.6%	18.4%	17.6%	18.1%	20.2%	21.3%	22.3%
Gas	23.7%	25.2%	25.7%	26.2%	26.8%	27.1%	25.7%	26.4%	26.8%	26.5%	25.4%	24.4%	23.2%
Oil	40.3%	39.6%	38.6%	37.2%	37.7%	36.4%	37.7%	37.5%	37.8%	37.7%	37.1%	35.7%	36.4%

# FF vs RE: Power Sector



Share in Total Capacity	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
RE	23.0%	20.7%	20.3%	20.5%	21.4%	21.8%	23.9%	23.4%	24.5%	25.2%	25.4%	25.4%	26.7%
Non-RE	77.0%	79.3%	79.7%	79.5%	78.6%	78.2%	76.1%	76.6%	75.5%	74.8%	74.6%	74.6%	73.3%

## Installed Capacity by Fuel Type



# Regional Cooperation



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- Regional & national levels: Member states – shape the policies & take actions
- Realising the targets – deployments of RE
- Common challenges include investment & regulation barriers but **foundation of knowledge** are equally important for long-term planning
- Dependent on International Organisations/ Dialogue Partners – not a sustainable solution
- **Challenges** of ASEAN member states:
  - Different levels of economic development
  - Limitations in technology knowledge and human capital in RE, esp. in CMLV
- **Opportunities**:
  - All member states have individual strengths
  - As a reference for others and share its best practices

# Knowledge Transfer within ASEAN



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## How?

Through Research, Development, & Deployment:

- Develop skilled labour force
- More competence ASEAN experts & practitioners
- Develop RE technology that adaptable to local context
- More technology innovations

## Players?

- Government (Policy & Plan)
- University, Industry (R&D, Deployment)

# Knowledge Transfer & Collaboration



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## University:

- Provide the base knowledge of RE Technology
- Develop & create new ideas/ products (prototype) – innovation & invention
- Technology improvements

## Industry/ company:

- Take the inventions and develop them into usable products
- Commercialized products

## University-Industry:

- To advance S&T and innovation

# University-Industry: Formal Knowledge Transfer Channels

- Collaborative Research/ Project
- Academic Consultancy
- Intellectual Property (IP) Licencing
- Research Mobility: Staffs
- Labour Mobility: Graduates
- Academic Spin-offs: start-ups established by academicians to commercialise research outputs



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# University-Industry: Informal Knowledge Transfer Channels

- Publication of research outputs: co-authors
- Conferencing and Networking
- Technology demonstration park
- Industry funded laboratories established at the universities
- Facility sharing
- Training activities

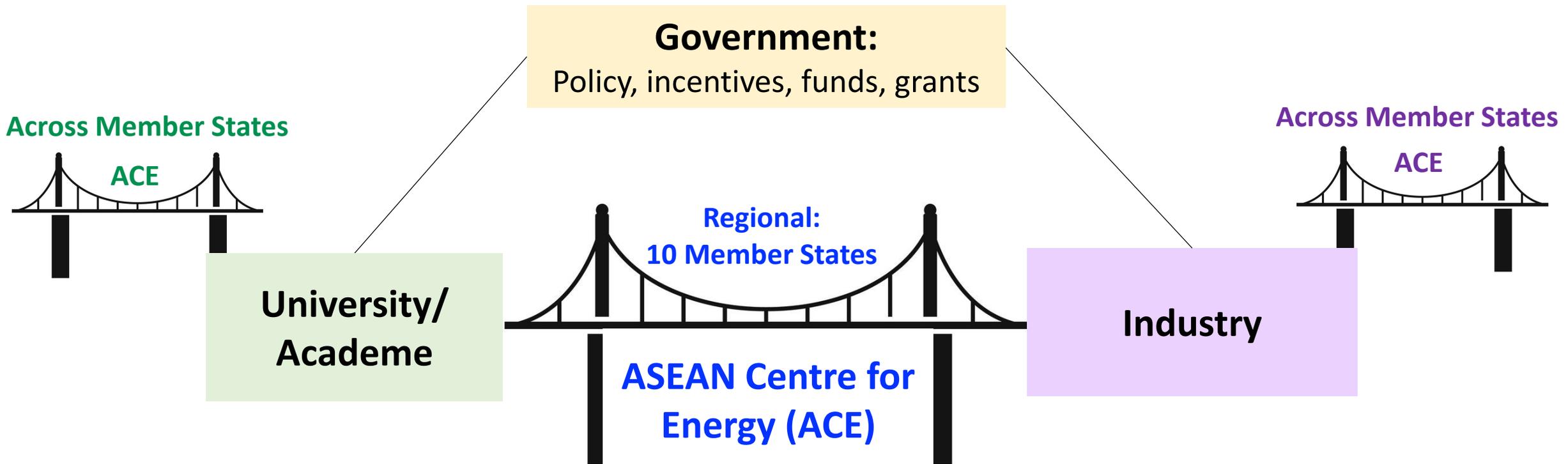


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# ASEAN Cooperation: Bridging Academe & Industry Communities



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# ASEAN Centre for Energy (ACE): Past RE Events



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Events	Organised by	Venue, Date	Participants
ASEAN Training of Trainers on Solar Technology for Renewable Energy Training Institutions	ACE (AGEP*), SERIS	Singapore 2-6 July 2018	<b>Academia</b> , researchers, <b>practitioners</b> , government officers
IRENA–ACE Renewable Energy Policy Support Mechanism Workshop	ACE, IRENA	Kuala Lumpur, 21-22 November 2018	Government officers, <b>technology experts, RE plant developer</b>
ACE Partners Coordination Meeting on Renewable Energy	ACE (AGEP)	Bali, Indonesia, 7-8 May 2019	Government officers, <b>academia</b>
Focus Group Discussion on Mapping Research and Development (R&D) on Renewable Energy (RE) Technologies and Policies in ASEAN	ACE (AGEP)	Singapore, 5 - 6 December 2018	<b>Government officers, Academia, researchers, power industry</b>

Publications available at: <http://www.aseanenergy.org/resources/publications/>

\*AGEP= ASEAN-German Energy Programme

# ASEAN Cooperation: University-University



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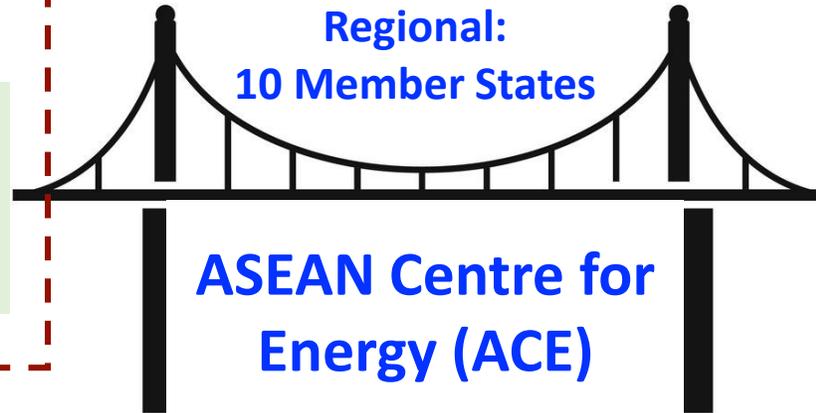
**Government:**  
Policy, incentives, funds, grants

Across Member States



University/  
Academe

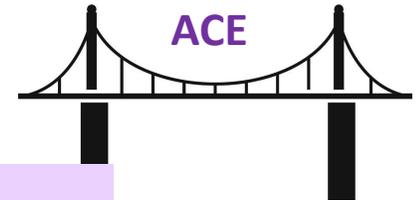
Regional:  
10 Member States



ASEAN Centre for  
Energy (ACE)

Industry

Across Member States



# Future Potential Network/Collaboration: University-University



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## ASEAN Cooperation:

Sharing expertise across member states in knowledge and technology development

## ASEAN-German Energy Programme (AGEP) Phase II at ACE:

- To enhance RE R&D Nodal Network across ASEAN member states

Through partnership, ACE could facilitate in:

- Regional RE Curriculum Development
- Conduct Undergraduate/ Postgraduate Courses in RE Technology: Blended Learning
- Training of Trainers (ToTs)

## ACE-University (at Present)

- Internship Programme (Bachelor & Master)
- Research Fellowships (PhD & Postdoctoral)
- <http://www.aseanenergy.org/about-ace/vacancy/>



# Climate Change Curriculum Development

Preparing the Next Generation of Climate Change Experts



USAID LEAF Curriculum Development Process

**1** Curriculum

**4** Modules

**3** Years

**6** Countries

**60** Universities

**700** Professors

**30,000** Undergraduates

**730** Graduates

## Regional Curriculum Development



Community Sustainable Energy



Courses available at: [courses.recoftc.org](http://courses.recoftc.org)



**Module 1**  
Basic Climate Change

**Module 2**  
Social & Environmental Soundness

**Module 3**  
Low Emission Land Use Planning

**Module 4**  
Carbon Measurement & Monitoring

### The e-learning platform will:

- Ensure sustainability of the climate change curriculum
- Provide a mechanism to receive user feedback and updates
- Introduce new target groups to the climate change curriculum
- Facilitate sharing of case studies and success stories by educators and practitioners
- Strengthen the network of academic institutions and stakeholders engaged in climate change education

### Key participating universities





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UNIVERSITY NETWORK FOR CLIMATE AND ECOSYSTEMS CHANGE ADAPTATION RESEARCH

POSTGRADUATE COURSES ON

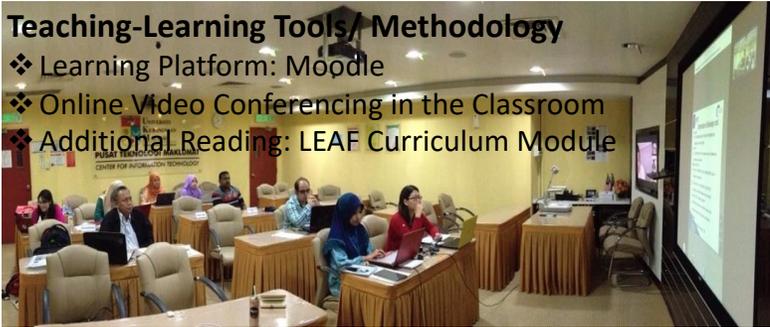
# RENEWABLE ENERGY

SPRING 2014

# Success Stories in Climate Change Education Advancement in the Asia-Pacific Region

## Teaching-Learning Tools/ Methodology

- ❖ Learning Platform: Moodle
- ❖ Online Video Conferencing in the Classroom
- ❖ Additional Reading: LEAF Curriculum Module



## Success Stories (2014-2015):

### Course Locations:

United Nations University, Tokyo Japan  
National University of Malaysia (UKM), Malaysia  
Gadjah Mada University, Indonesia  
Indian Institute of Technology, Kharagpur, India  
Australian National University (ANU), Australia  
The University of Tokyo, Kashiwa Japan  
Chulalongkorn University, Bangkok Thailand  
Vietnam National University, Vietnam

### Course I: Science, Impacts and Vulnerability

**86 Persons** from **22 Countries** were trained  
16 Sessions delivered by **7 Experts** from **3 Countries**

### Course II: Approaches to Adaptation

**83 Persons** from **24 Countries** were trained  
15 Sessions delivered by **8 Experts** from **5 Countries**

## Participant Feedbacks:

### Climate Change Education

“Lack of awareness on climate change at the local level, and hence such courses should involve more students and government officers” – postgraduate students

“Helped in enhancing knowledge that can be applied into daily duties” – decision maker

### Teaching-Learning Methods

“No distant feeling though the lecturers were far away; interaction was just perfect as long as internet worked well” – postgraduate students

“No travelling needed to attend an international training course; reduced carbon footprint, saved money, saved time” – postgraduate students & decision maker

## Participants:

Postgraduates, researchers, decision/ policy-makers (Multi-disciplinary)

## Active Learning



## Group Assignments & Presentations



## Forum on Climate Change

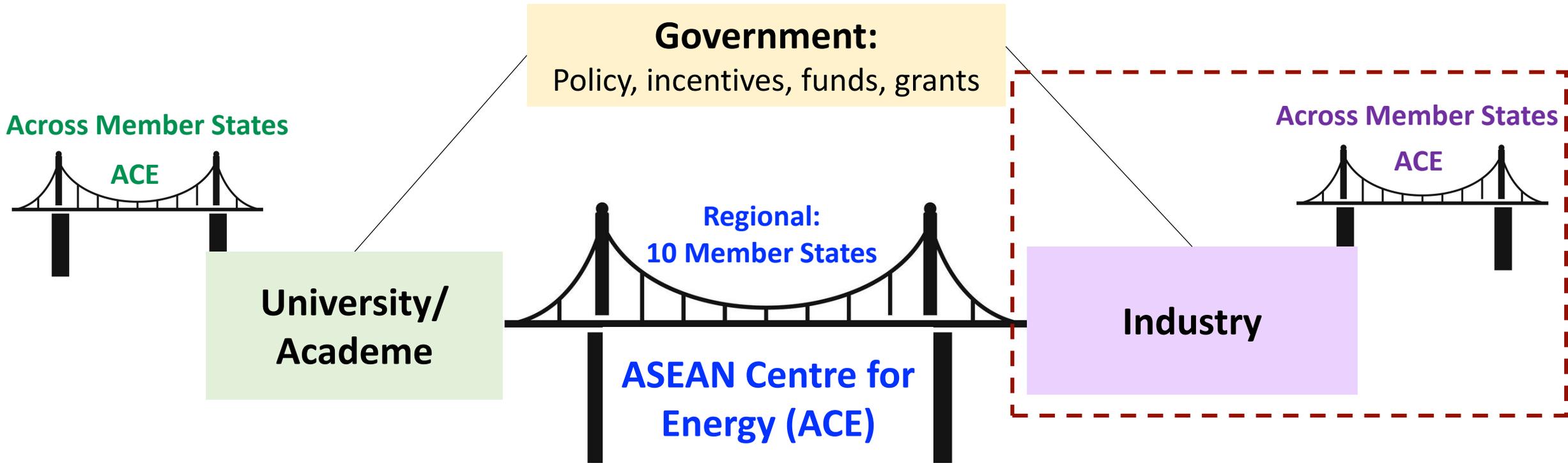


## Debate

# ASEAN Cooperation: Industry-Industry



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# Future Potential Network/Collaboration: Industry-Industry



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## ASEAN Climate Change & Energy Project (ACCEPT) at ACE:

- To establish a [directory database](#) of energy professionals (public & private) across AMS according to expertise

## ACE could be:

- [Resource centre](#) for industries look for regional business partnership

## Annual Event: ASEAN Energy Business Forum (AEBF)

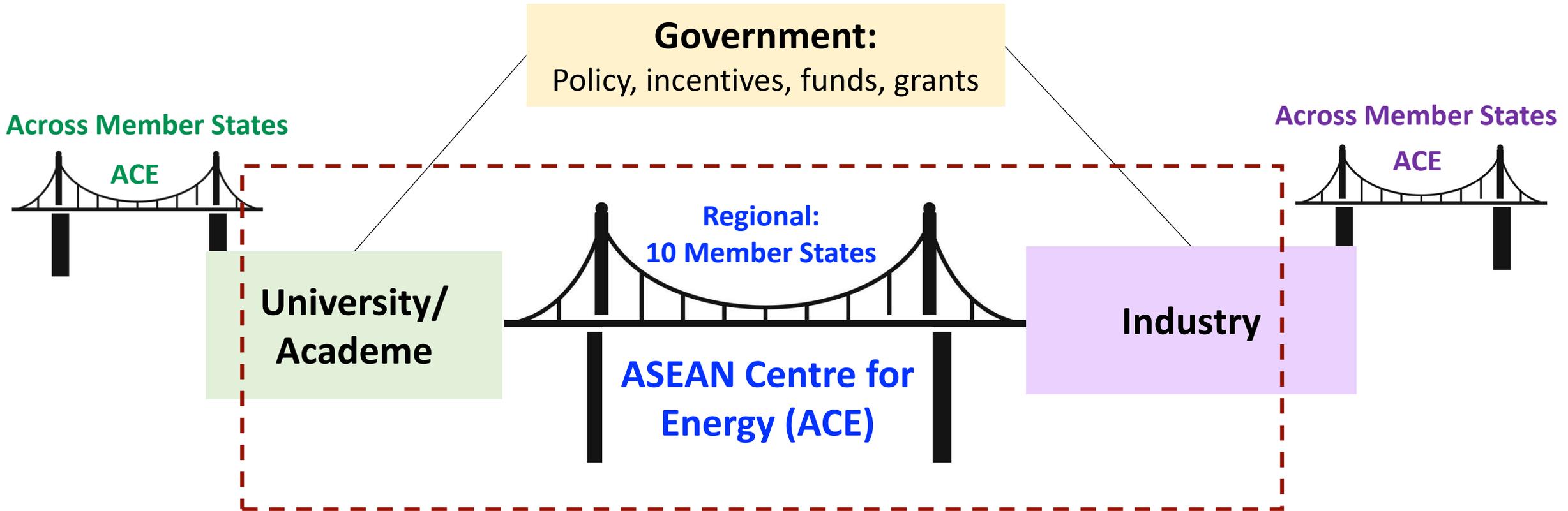
- In conjunction with the ASEAN Ministers on Energy Meeting (AMEM)
- Provide information on the latest regional energy investment opportunities, policy initiatives and the investment regulatory environments – ASEAN energy developments
- Guest government representatives, e.g. IRENA and the IEA share world-view policy and regulatory perspectives.



# ASEAN Cooperation: Industry-Industry



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# Future Potential Network/Collaboration: University-Industry



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**The university and industry do not know each other  
well enough**

# ACE: Regional Communication Channel

*Bridging communication gaps*



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## Gap: Competent Human Capital in RE industry

- Graduates may not be the “ready-made” workers
- Need to be tailored to the needs of the industries



Improved Curriculum Development  
Effective Training Courses for Practitioners  
Staffs/ Students Exchange

## Gap: Technology knowledge Transfer

- Ideas & Innovations may not meet industry’s needs
- Potential partners for research collaborations
- Research Facilities



University-Industry: Technology solutions  
RE technology: adaptable to ASEAN context  
More local commercialized products

# Importance of Resource Platform



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## Academe:

- Directory of experts, practitioners in Southeast Asia
- According to professions, universities across AMS

## Industry

- Directory of SMEs, companies, manufactures, supply & distributors Southeast Asia
- According to fields, expertise, types of services & products across AMS

## ➤ ASEAN RE Network

- Comprehensive information can be further developed into strength mapping across AMS

# EU Smart Grid Network



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Learning from the EU:  
Mapping individual strengths of  
member states

	Austria	Belgium: Flanders	Cyprus	Czech Republic	Denmark PowerLabDK	Denmark SEN	France	Germany: BW	Greece	Ireland	Italy	Latvia	Netherlands	Norway	Poland	Slovenia	Spain	Switzerland	UK
Smart Metering																			
Demand Response																			
Market Integration																			
Storage																			
Privacy/Data Security																			
Regulation																			
Integration of Renewables																			
Reference Architecture																			
Island Power Systems/Cells																			
Smart Cities																			
Home Intelligence																			
E-Mobility																			
Distribution Network Solutions																			
Education/Training/Seminars																			
Grid (infrastr.) Intelligence																			
Holistic Energy Concept																			
Industrial Prosumers																			

Source: [www.smartgrids.eu](http://www.smartgrids.eu)

# ACE: Regional Communication Channel

## *Offer Networking Opportunities & Knowledge Sharing*



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### ACE Regular Webinars

- Speakers & participants: Academe, industry, government officers, public
- Upcoming:
  1. “Gender and Renewable Energy in ASEAN Region”, Monday, 9 December, 14.00 – 15.00 WIB (With UNEP)
  2. “Regional Spatial Mapping and Economic Analysis for Renewable Energy Planning” (With USAID)

# ACE: Regional Communication Channel *Through Policy Research Collaborations*



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## University-ACE-Industry

- Policy briefs
- Policy reviews
- Development of technology policy: insights to Governments
- E.g ACCEPT: ASEAN Thematic Papers on Energy and Climate Change
- Call for interest: <http://www.aseanenergy.org/about-ace/vacancy/>
- Welcome collaborations between ACE and academe, public & private sectors

# University-Industry: Roles of Government

- Offer **research grants** for **universities** collaborating with industries and commercialising the research products
- Offer **grants and R&D tax credits** for **firms** collaborating with universities.
- Policy-makers to assess best practices in other ASEAN countries
- Policy-makers could offer **guidelines** to universities that delineate best practices for university-industry partnerships
- Invest in **regional** research and development (R&D)



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# University-Industry: Roles of Government

- Allocate funding for incubators e.g. **ASEAN science/technology parks** to demonstrate the smart grid in integrating RE
  - **Nanyang Technological University, Singapore (NTU)**
  - **The Renewable Energy Integration Demonstrator - Singapore (REIDS): Research, Development, Demonstration and Deployment Platform for microgrid systems at Semakau Island (20 private collaborators)**

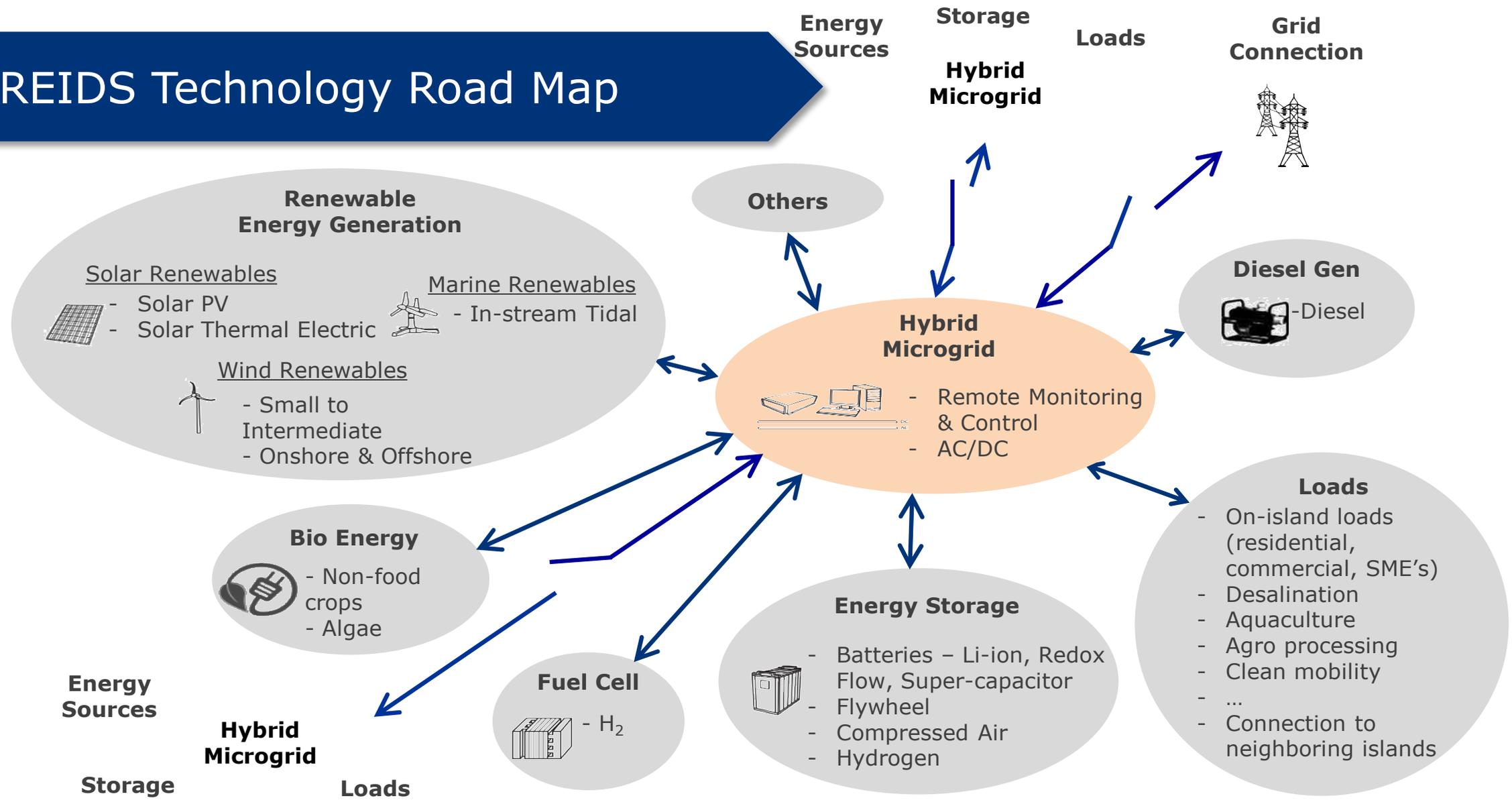


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# REIDS 3D rendering



# REIDS Technology Road Map





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### Adopters



**MERALCO**



*Bawah*  
PRIVATE ISLAND

### Solutions Providers



### Coordinator



**NANYANG  
TECHNOLOGICAL  
UNIVERSITY**

### Supporting Agencies

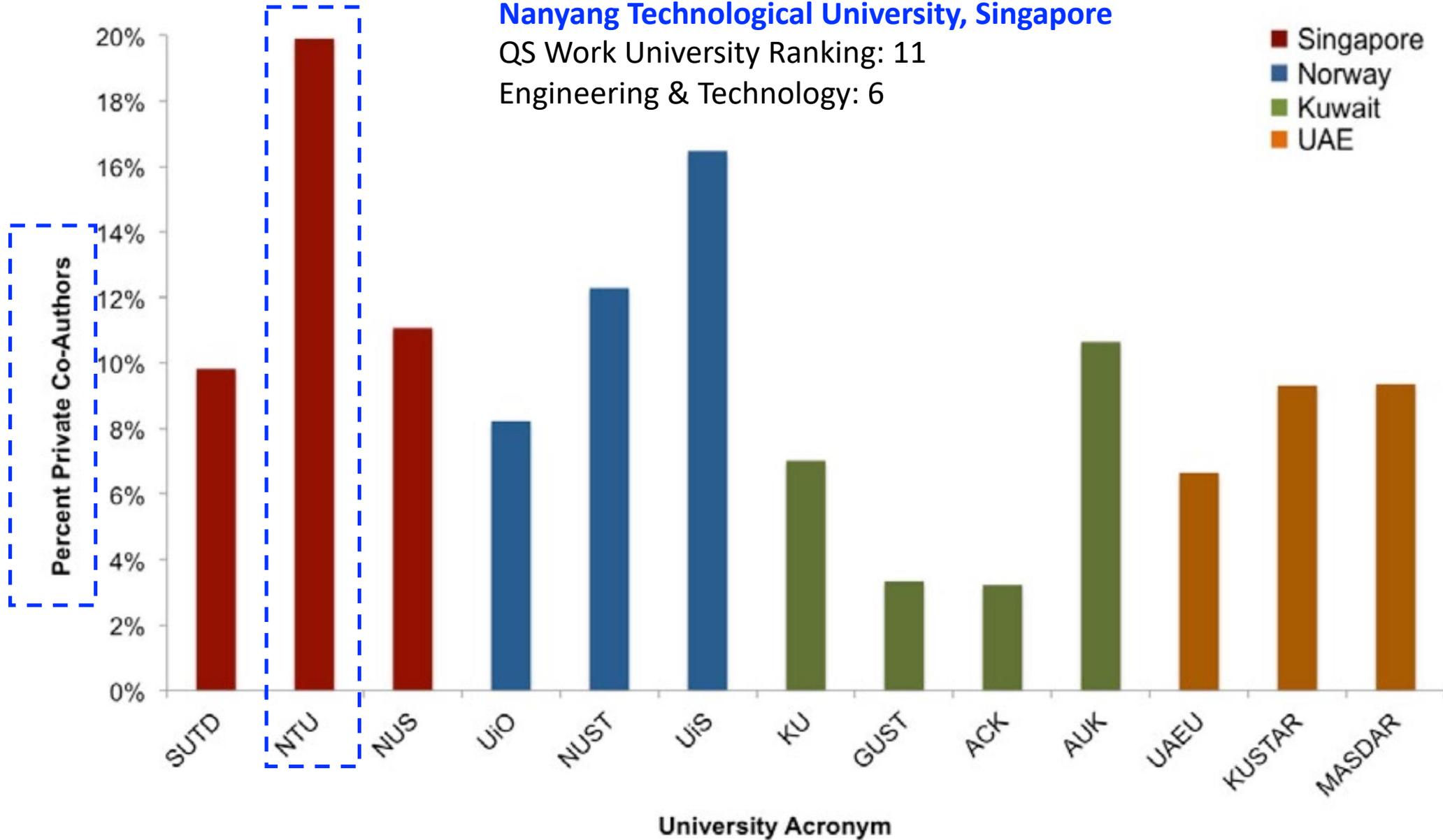


**NATIONAL  
RESEARCH  
FOUNDATION**

## Nanyang Technological University, Singapore

QS Work University Ranking: 11

Engineering & Technology: 6



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# Research & Innovation Investment from Public & Private

## R&I Investment in Energy Technologies (2015)



Source: Pasimeni, Francesco; Fiorini, Alessandro; Georgakaki, Aiki; Marmier, Alain; Jimenez Navarro, Juan Pablo; Asensio Bermejo, Jose Miguel (2018); SETIS Research & Innovation country dashboards. European Commission, Joint Research Centre (JRC).



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# ASEAN Cooperation: University & Industry working together towards a knowledge economy

Thank you

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ASEAN Centre for Energy (ACE)