

**Current Status of Renewable Energy in Myanmar and Key Recommendations As
Part of JASTIP Project by Kyoto University**

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Yangon Technological University (YTU), Yangon, Myanmar

**Renewable Energy Research in Department
of Research and Innovation**

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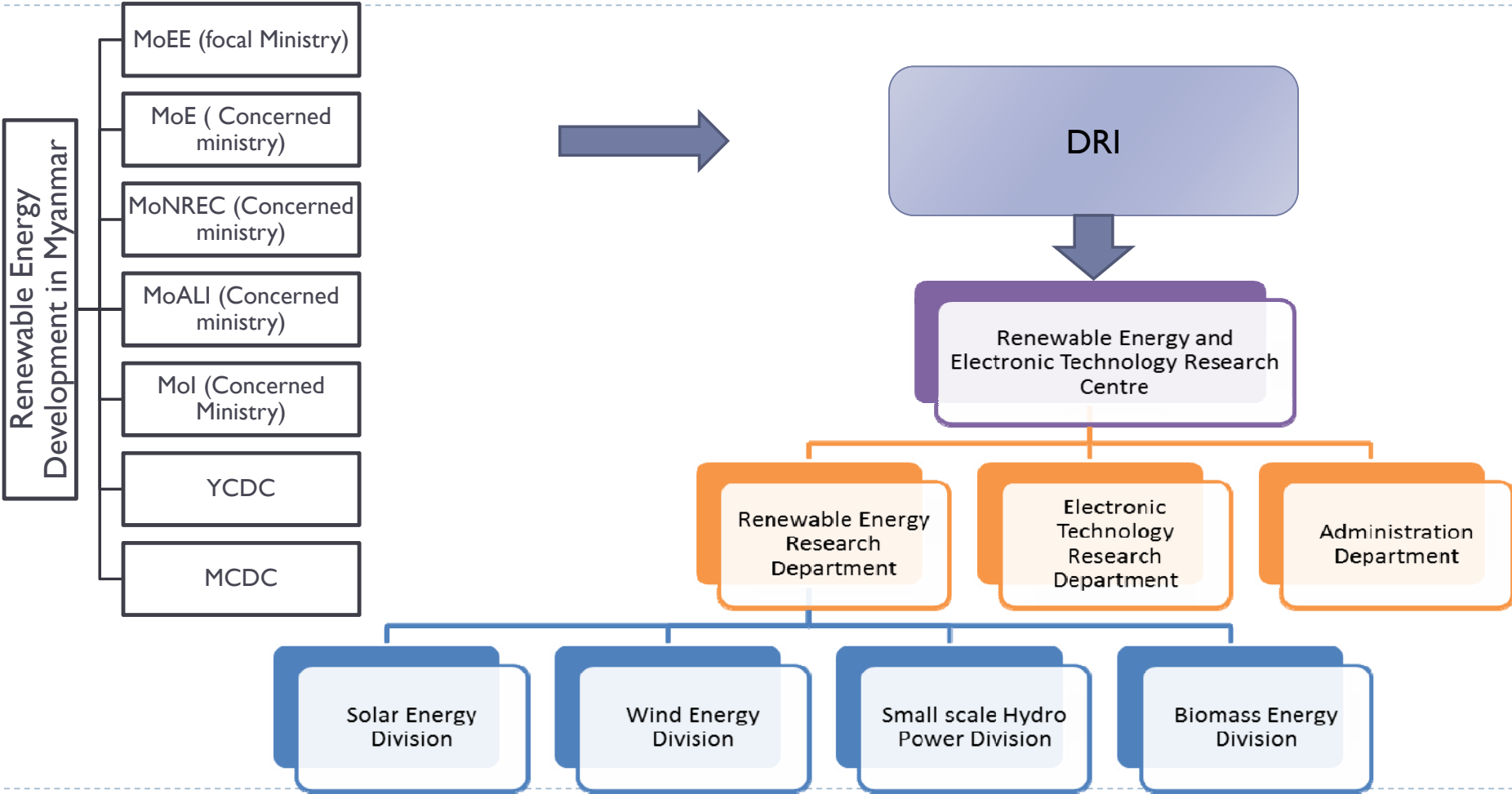
**Diploma in Renewable Energy and Clean Energy
Technologies (Moscow, Russia)**

Deputy Director General, DRI, MoE

Outlines of Presentation

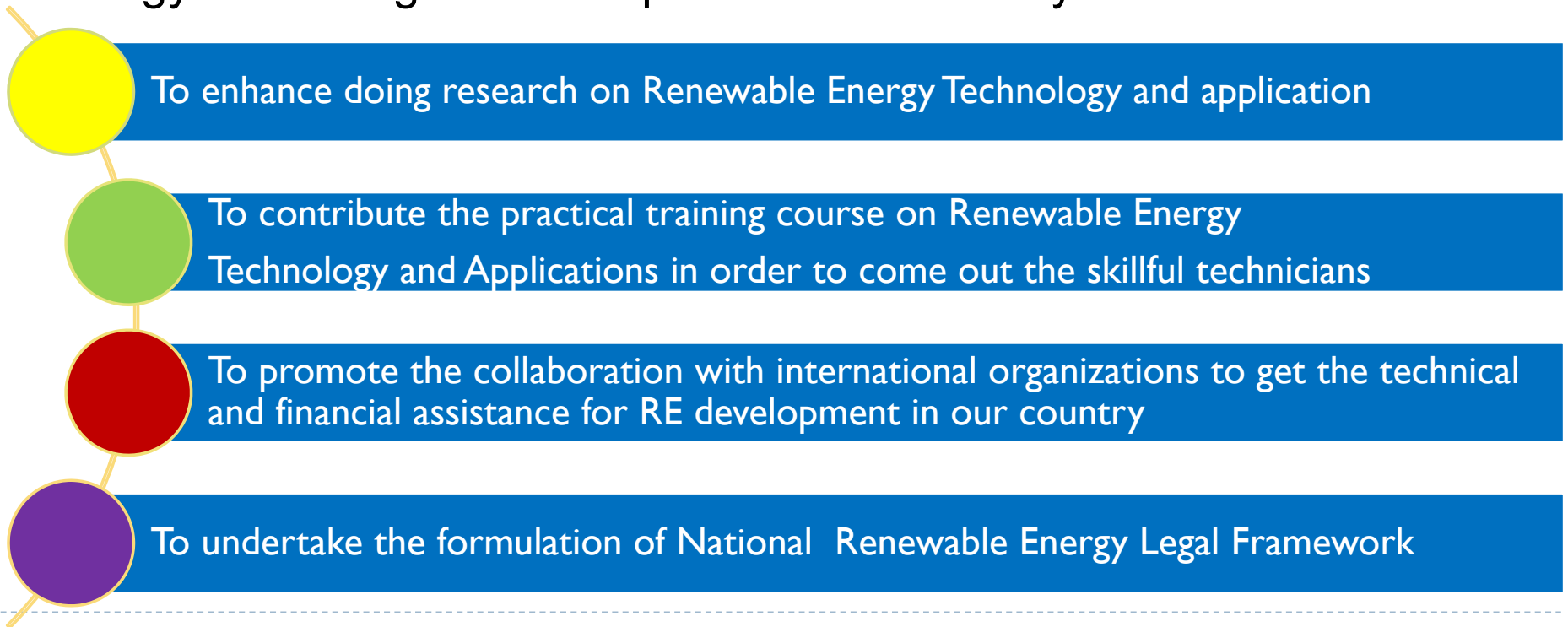
- ▶ **Policy and institutional framework of RE in Myanmar**
- ▶ **Current Situation of Energy Supply and Demand and Electricity Generation Mix in Myanmar**
- ▶ **Activities of RE Research Department**
- ▶ **Key Recommendations**

Institutional framework of RE Development



OBJECTIVE & MAIN FUNCTION OF RE RESEARCH DEPT:

- To enhance the doing research, human resource development and collaboration with international organizations concerning renewable energy Technologies Development in our country



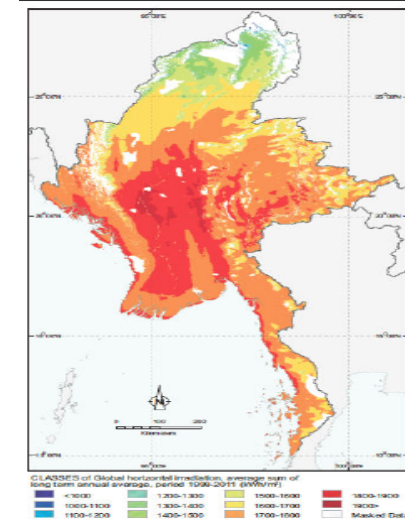
POLICY DEVELOPMENT

- ▶ National Renewable Energy Committee(NREC) was formed on 6 Feb, 2019 in accordance with notification of president office. (focal Ministry-MoEE). It is to enhance RE related functions to fulfill Sustainable Development aligned with Environmental Conservation
- ▶ The total cost of National Electrification Program is estimated at US \$ 5.8 billion (grid and off-grid) till 2030. NEP aims to electrify 7.2 million households and achieve universal access to electricity by 2030. (conducted by DRD)
- ▶ In 2030, the maximum demand will increase approximately 14.5 GW. The electricity installed capacity will be expected to rise 27 GW. Large scale hydro can be available 6% and small and medium hydro will be installed 32%. Gas (20%), coal (33%), solar and wind (9%, Renewable Energy) are also expected to meet the balance demand forecast of 2030. (Conducted by MoEE)
- ▶ National STI law was promulgated on 25th June, 2018. According to this law, National STI Council has also been formed recently in 2019 to encourage and support on Scientific Research and Innovation in Academic, Commercial and Social Sectors of the Country.

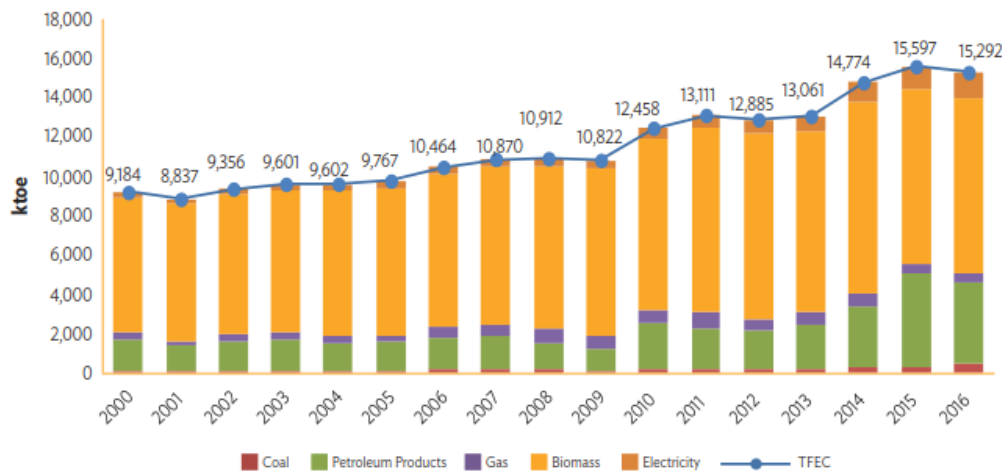
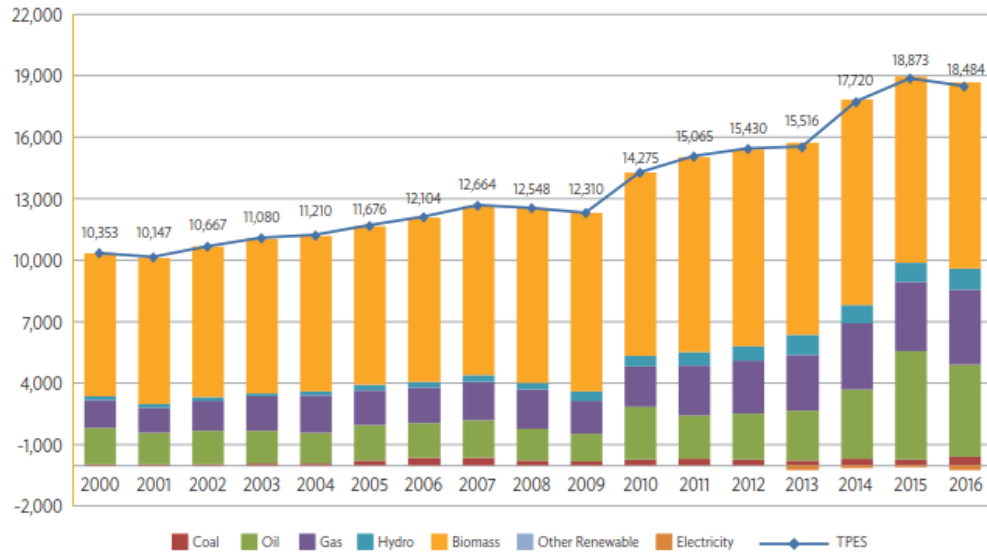


Potential of Renewable Energy in Myanmar

RE Resources	Potential
Solar Energy	60% of the land area which is suitable to PV. GHI levels of between 1,600 and 2,000 kWh/m ² /yr, DNI levels of approximately 1,400 kWh/m ² /yr, maximum technical solar power potential is estimated at about 40 TWh/yr (ADB) 51973.8 TWH per year (NEDO)
Wind Energy	low average wind speeds (below 4 m/s) and the theoretical generation potential could be in the order of 80 TWh/yr 365.1 TWH per year (NEDO)
Hydro Power	108 GW
Biomass Energy	Rice husk (4.4 M ton/yr), Lumber waste(1.5 M ton/yr), Bagasse (2.1 M ton/yr) and Livestock Waste (34.4 M ton/yr)
Geothermal	93 locations



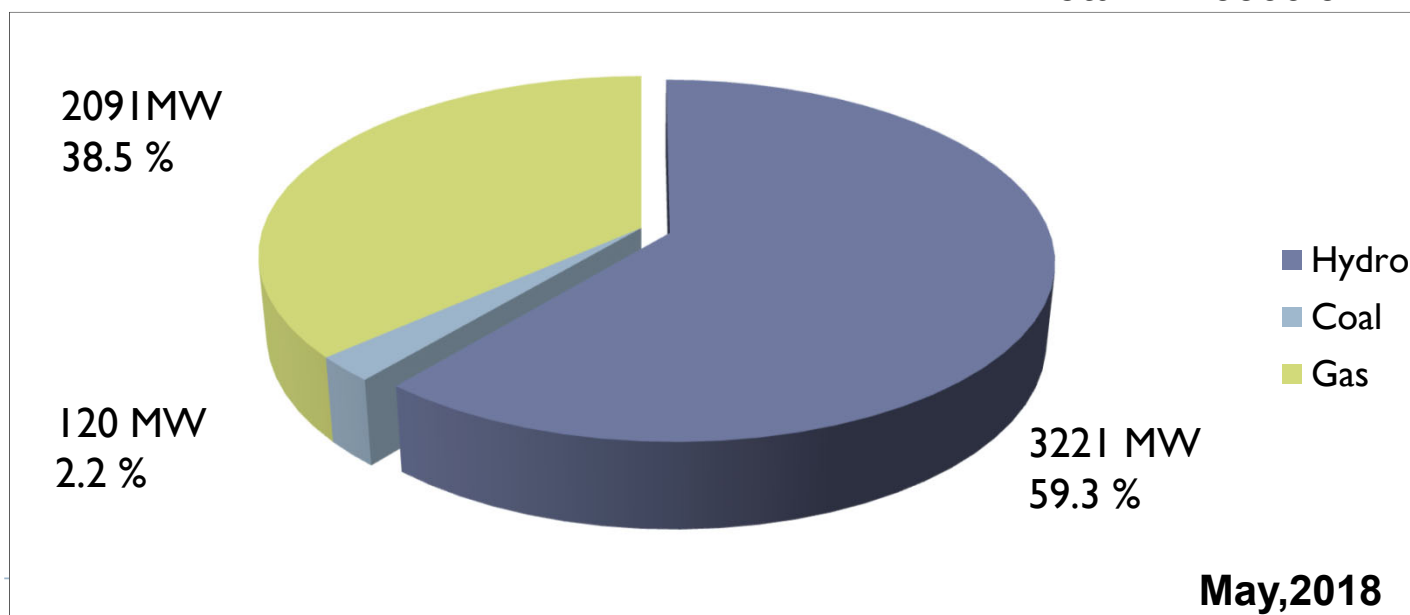
Energy Demand and Supply in Myanmar



- ▶ The share of oil in 2016 increased to 24% whilst gas share increased to 20%. Coal share increased by only 2% in 2016. In 2000, the share of biomass was 67% whilst, in 2016, the share declined to 49%.
- ▶ Hydro supply plays a major role in providing the electricity needed to meet the increasing domestic demand.
- ▶ Moreover, electricity from hydro is also exported. The net electricity export of Myanmar in the TPES was - 218 ktoe in 2013 and -205 ktoe in 2016.

Existing Myanmar Electricity Generation Mix

Types of Power Plants	No. of Stations	Installed Capacity (MW)
Hydropower Plants	27	3221
Coal-fired Thermal Plants	1	120
Gas Turbine	28	2091
Installed capacity connected to Grid		5432 MW
Small Hydro (Off Grid)	33	33.3 MW
Diesel (Off Grid)	101	101 MW
Total		5566.3 MW



Source: MoEE

DOMINANT RESEARCH ACTIVITIES (SOLAR ENERGY)

- ▶ Green House Type Solar Dryer (4 nos of projects , Boke Pyin, Ye Township, Magwe region and DRI campus) aim to develop the socio economic of people live in rural area)



DOMINANT RESEARCH ACTIVITIES (BIOMASS ENERGY)

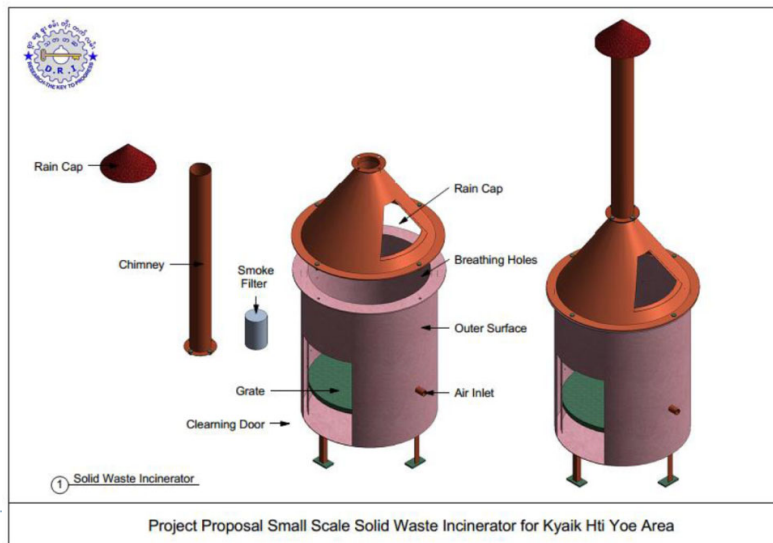
- ❖ Design and Construction of 3.5 cubic meter family type biogas plant (5 nos of plants, in Bogalay Township, Ayeyarwaddy Delta Region) aim to reduce utilization of charcoal and firewood in rural area and to be more income
- ❖ Financial assistance by Welt hunger hilfe Organization from German



DOMINANT RESEARCH ACTIVITIES (BIOMASS ENERGY)

Design and Construction of Small Solid Waste Incinerator plant for Kyaik htee yoe mountain:

- ❖ to be clean the kyaik hti yoe mountain area
- ❖ to remove the solid waste from this area systemtically



DOMINANT RESEARCH ACTIVITIES (BIOMASS ENERGY)

Design and Fabrication of Improved Cooking Stove

- ❖ To save 50-60% of the traditional fuel used
- ❖ To reduce CO₂ emission in the atmosphere
- ❖ To help conserve the forest resources of the country
- ❖ to reduce the cooking time



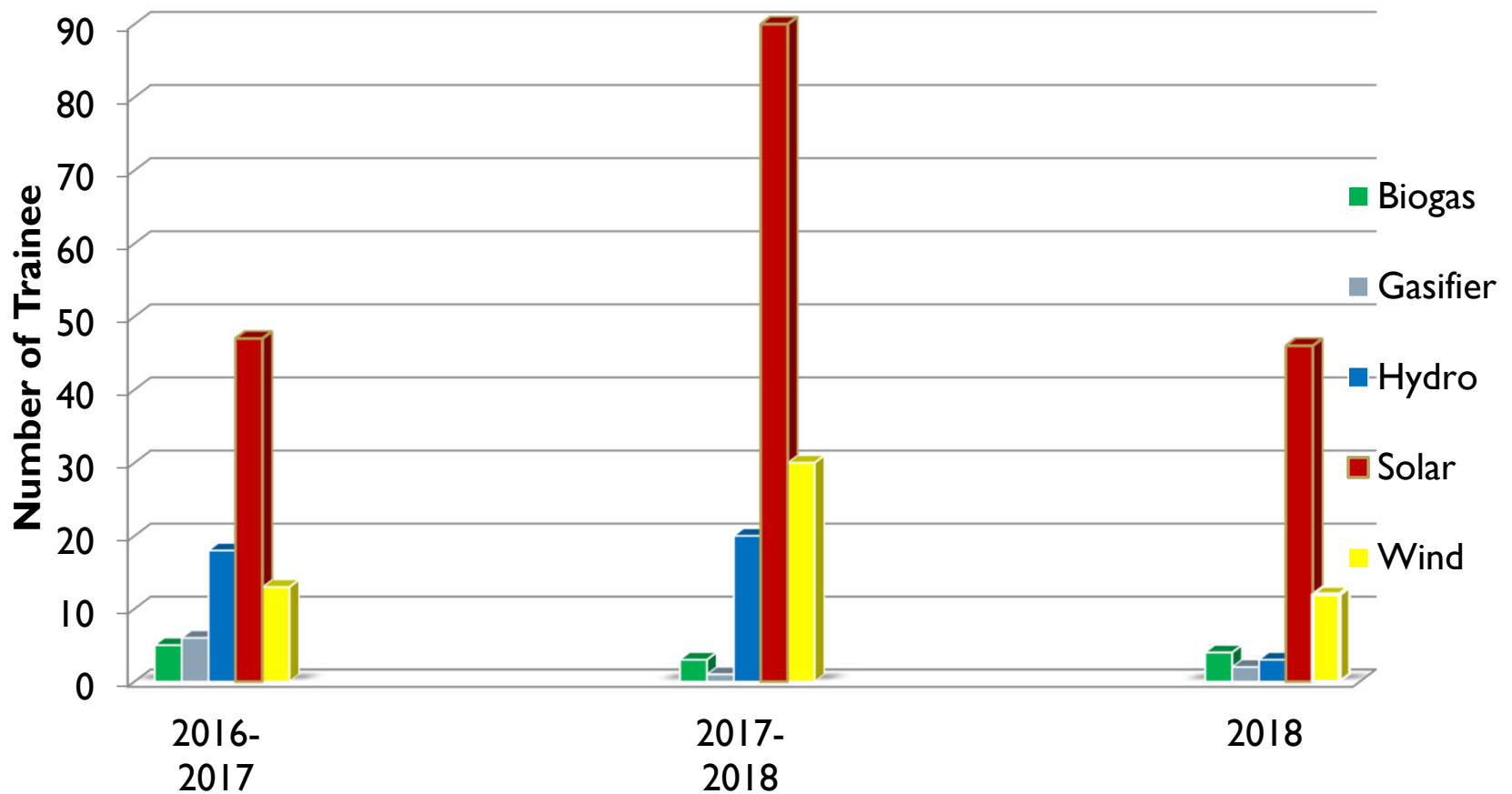
RE SHORT TERM PRACTICAL TRAINING COURSE

Wind, Solar, Micro Hydro Rice Husk Gasifier and Biogas Digester plant Courses

- ▶ To contribute technical knowledge, awareness and experience in Renewable Energy
- ▶ To come out skillful technicians and workers in renewable energy



RE SHORT TERM PRACTICAL TRAINING COURSE



Activities of RE Training Course



MoU for RE development

- ▶ already signed on MoU between Ministry of Education, Myanmar and Ministry of New and Renewable Energy, India for the cooperation of Renewable Energy field (Solar energy, wind energy and biomass energy) on 29 August 2016 at New Dali in India.
- ▶ signed on MOU Between Department of Research and Innovation and Asia Air Survey (AAS) for Research and Development on Renewable Energy on 21st September , 2017 at Inyar Lake Hotel in Yangon.
- ▶ Signed on Solid State Lighting (SSL) Cooperation - Renewable Energy and Electronic Technology Research Center (REETRC) and International Solid State Lighting Alliance (ISA) China
- ▶ Cooperation with China, Global Environmental Institute (GEI), Guangzhou Institute of Energy Conversion, Chinese Academy of Science have being implemented in continue research collaboration program for Renewable Energy Implementation Pilot Project, Potential Assessment of Solar Energy Zones and Selection of Interested Area are doing research under work plan.
- ▶ signed on MoU with some Technological Universities in Myanmar for cooperation of joint research and internship programme for RE development.



Workshop Programme on RE Development



Regarding to the implementation of the cooperation program, workshop on Promoting Renewable Energy and Sustainable Development in Myanmar was hosted by DRI, Ministry of Education, Myanmar and Global Environmental Institute, China at Grand Amara Hotel, Nay Pyi Taw, Myanmar on June 6th to 7th, 2018.



Workshop on "Innovation Research on Electric cooking and beyond" which took place in DRI, cooperation with REAM, Gamos Consultant Company and Loughborough University, England from the 29th to the 31st January 2018



Workshop Programme on RE Development



1st German Solar Training, Department of Research and Innovation (10th – 13th July, 2017) cooperation with GIZ, Germany, DRI, Yangon



Consultation Workshop for Renewable Energy Development in Myanmar, 15, March, 2017, DRI, Yangon

Workshop programme on RE Development



"Green Energy Technology Practical Training " organized by Renewable Energy Research Department, Department of Research and Innovation(DRI) cooperated with SANDISOLAR Company and Green Energy Industry Association of Yunnan Province, China in 27th to 29th , September 2018 at Yangon, DRI.



"Technical Training on Renewable Energy Implementation in Myanmar " had been jointly organized by DRI, Ministry of Education, cooperating with Guangzhou Institute of Energy Conversion, Chinese Academy of Sciences and Global Environmental Institute, China on October 22th to 24th , 2018.



Seminar on Strengthening Knowledge, Research & Practice for Professional Development of Internship Students & Awarding Certificate



Internship Students from TU in Myanmar
Time Duration: during May & June 2019
Number Students: 101 Students (EP and Mech)



Poster Show Activity in World Environment Day



Key Recommendations

- ▶ Need to formulate the policies and regulatory framework to strengthen the development of RE
- ▶ Need to enhance coordination mechanism among various organizations responsible for conducting research of RE Technology
- ▶ Need to develop RE portfolio standards
- ▶ Need to provide more infrastructure(testing lab and training center) and equipment to carry out the research works
- ▶ fulfillment of experts, researchers and skilled workforce in Research Institutes
- ▶ Establishment of RE research fund for University and research Institutes
- ▶ To encourage PPP, IPP for deployment of RE project



Thank you for your
attention

