



ASEAN Centre for Energy
One Community for Sustainable Energy



The Transformative Role of Renewables in Southeast Asia

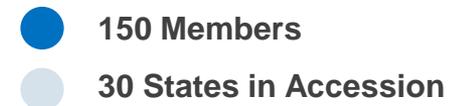
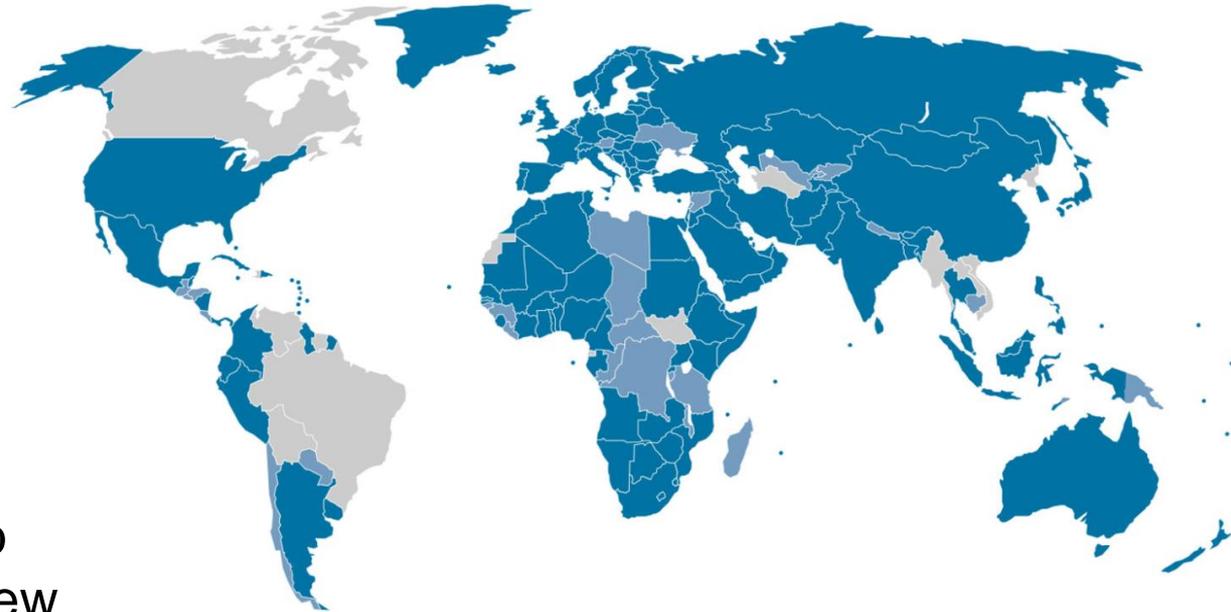


Asia Clean Energy Forum 2017, ADB, Manila
Deep-dive session – 6 June 2017



Key facts about IRENA

- Established in 2011
- Headquarters in Abu Dhabi, UAE
- IRENA Innovation and Technology Centre – Bonn, Germany
- Permanent Observer to the United Nations – New York



Mandate: Assist countries to accelerate renewable energy deployment

IRENA's engagement in Southeast Asia

Regional perspectives:

- Renewable Energy Outlook for ASEAN (2016), joint-report with ACE
- Biofuel Potential in Southeast Asia (released today)
- Renewable Energy Market Analysis for Southeast Asia (forthcoming)

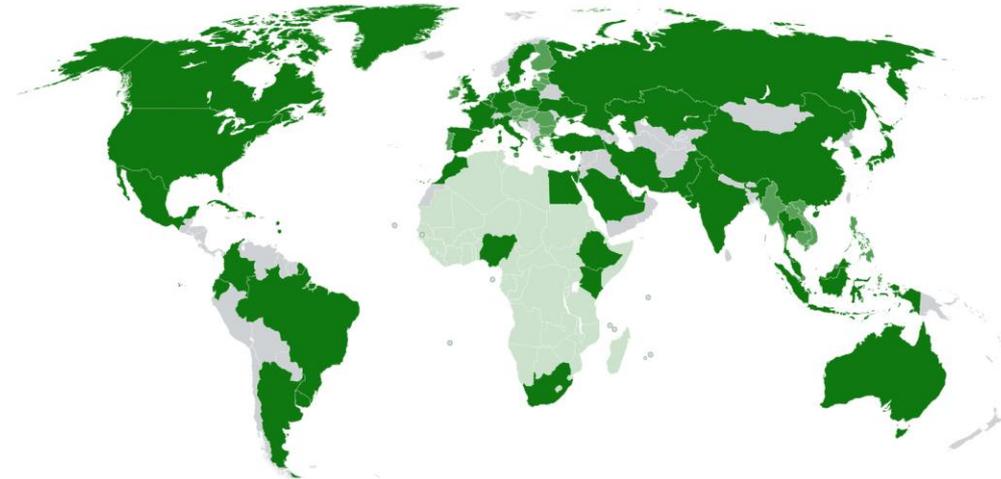
Country perspectives:

- Renewable Readiness Assessment (RRA) for the Philippines (2016)
- Renewable Energy Prospects (REmap) for Indonesia (2017)
- Joint RRA-REmap report for Thailand (forthcoming)

AND many activities relating to the Asia power grid, bioenergy, projects facilitation, standards, auctions and policies

IRENA's REmap programme

- Increase renewable energy deployment in line with SDG7
- Support the G20 in determining pathways for Paris Agreement
- Strong country focus and engagement with 10+ country projects and regional efforts
- Identifies concrete technology options for renewable energy for countries and sectors to 2030+
- Outlines benefits (economic, social, environmental) and investments



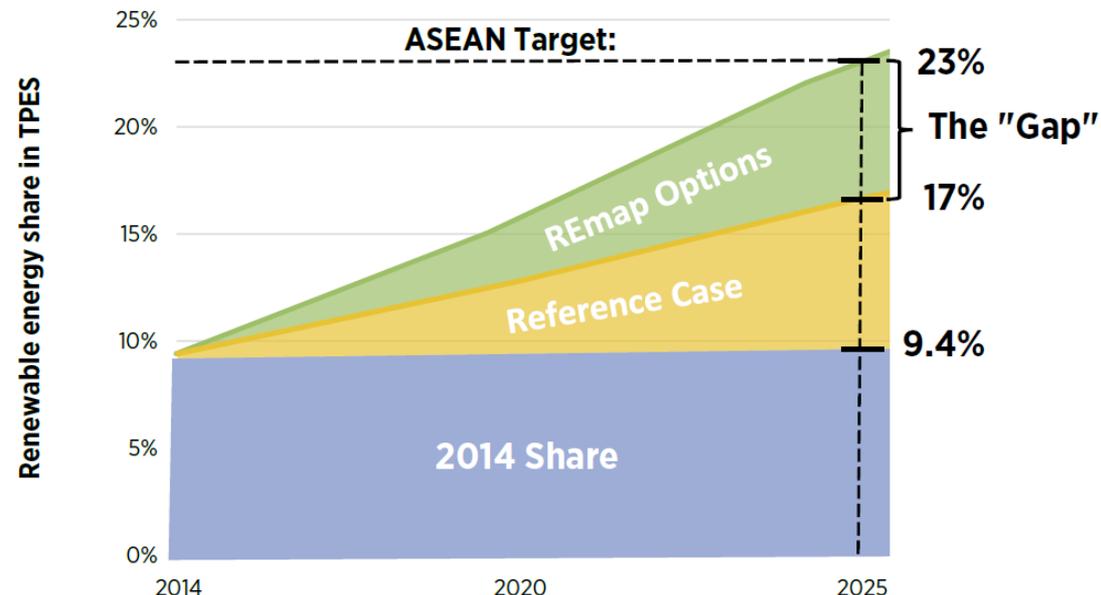
In cooperation with 70 countries representing 90% of global energy

Renewable Energy Outlook for ASEAN (released Oct. 2016)

Aspirational target of 23% renewable energy share in total primary energy supply (TPES) by 2025

- 2014 – 9.4%
- 2025 BAU – 10% (AEO4)
- 2025 Advanced Policy Scenario (APS) – 15.4% (AEO4 from 2015)
- IRENA Reference Case – 16.9% (APS + latest country updates)
- Still 6% point gap to the 23% target

-> REmap Options identified how to close this gap in consultation with the ten ASEAN Member States



Renewable Energy Prospects for Indonesia (1)

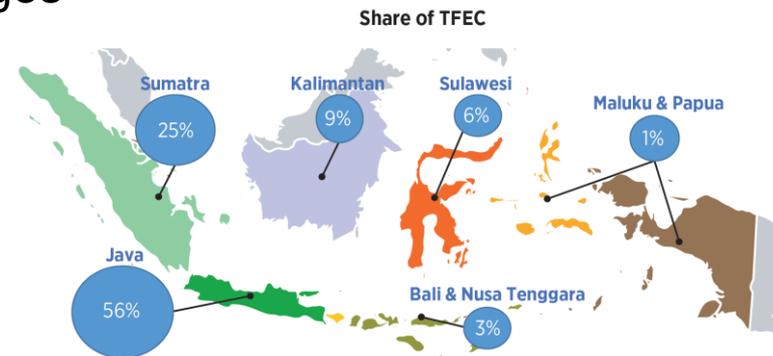
Collaborative process with Indonesian government throughout 2016

with numerous meetings and consultative workshops



- Rising energy demand - +65% from 2000-2014, +80% from 2014-2030
- Electricity demand will increase by more than 200% by 2030
- Coal use in TPES would increase more than 100% in the Reference Case by 2030, and with it increased CO2 emissions, air pollution and water issues
- Liquid biofuel blending mandates – while advancing the transition to renewable energy sources – come with supply side challenges

-> Trad. bioenergy dominates, and geography, islands provide unique opportunity for renewables to transform how Indonesian's get their energy

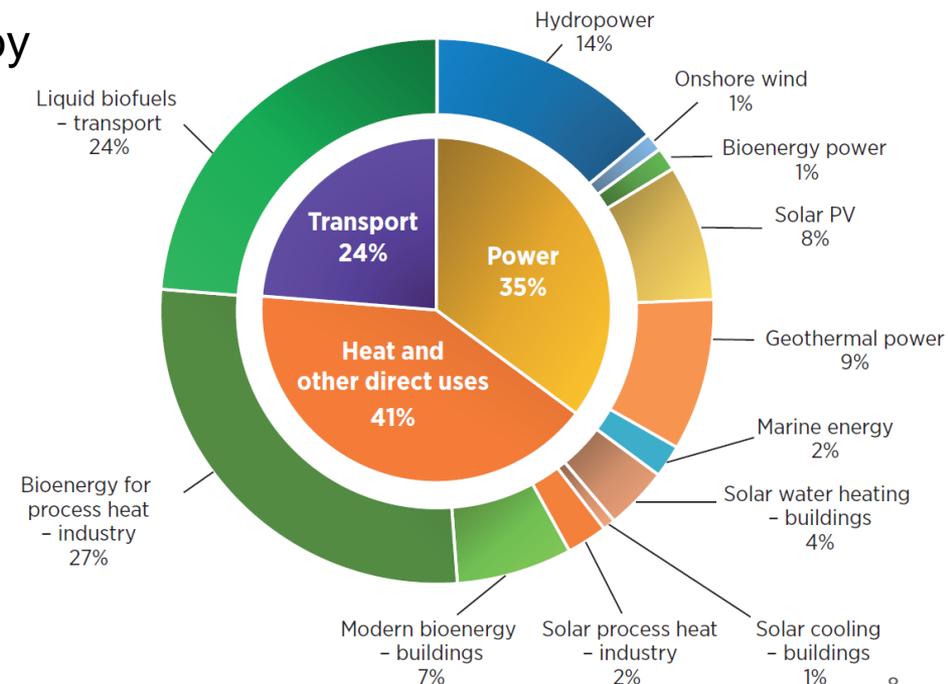


Breakdown of energy consumption in TFEC by region

Renewable Energy Prospects for Indonesia (2)

- RE share: today 6%; Reference Case 17%; and in REmap 23% in TFEC in 2030 (31% in TPES)
- Almost equal contributions of renewable power and heat in REmap
- REmap levels of RE reduce total energy system costs by USD 1.7 bln per year by 2030
- REmap also reduces costs associated with adverse health effects from air pollution and environmental damage (CO₂) by between USD 15-51 bln/yr
- Renewable energy jobs could increase from 100k today to 1.3 million in 2030

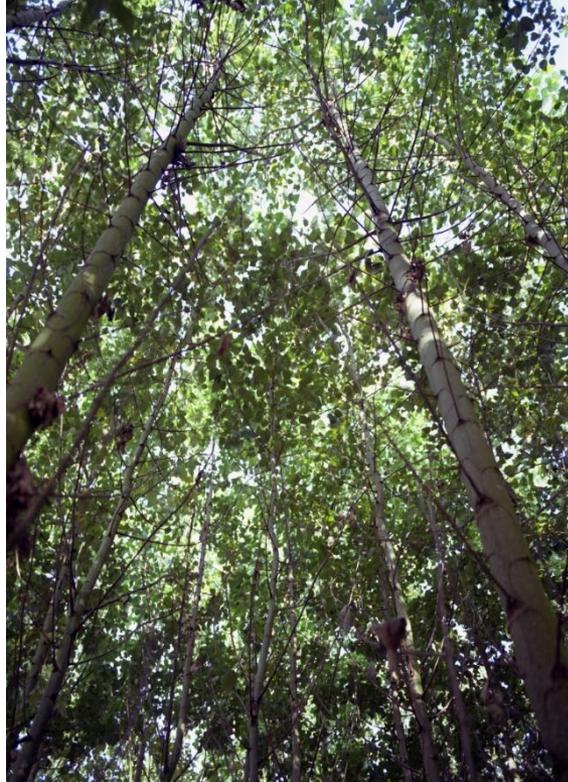
REmap total renewable energy use: 2 839 PJ/year



RRA-REmap report for Thailand (forthcoming late 2017)

- First joint RRA-REmap report from IRENA combining two strengths:
 - RRA process for assessing energy context, institutional frameworks, policies and barriers
 - REmap focus on developing accelerated renewable energy technology options and quantifying those options in terms of costs, benefits and investments
- Projection timeline:
 - First consultative workshop in November 2016, second consultative workshop in February 2017, final validation meeting in mid-summer, and report release in late August (tentative)
- Aim is to assess how Thailand can meet its Alternative Energy Development Plan by 2036, and go beyond

Biofuel Potential in Southeast Asia:
raising food yields,
reducing food waste,
utilizing residues



BRIEF SUMMARY SLIDES

For more information:

Jeffery Skeer
JSkeer@irena.org



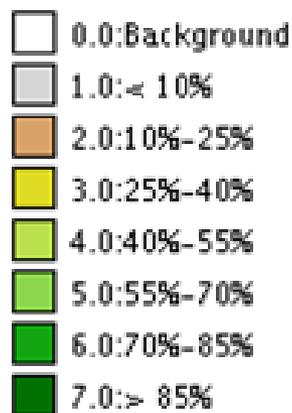
Types of Biofuel Potential Examined

- **Farm Residues** (more thorough collection)
- **Forest Wood** (sustainable annual extraction)
- Freeing Land with **Higher Food Yields**
- Freeing Land with **Reduced Food Waste**

- **Not considered, but also important globally:**
 - **Better Use of Pasture Land: 950 M ha**
 - **Forest Landscape Restoration: 350 M ha**

Ratio of Actual to Potential Yield for Rice (Year 2000)

Legend: Class



Source: Global Agro-Ecological Zones

Some SE Asia Biomass Potentials

Country	Residues Potential with 50% Collection (PJ/year)	Potential from Closing Yield Gap (PJ/year)	Potential from Reduced Waste If Yield Gap Is Closed (PJ/year)	Forest Energy Wood Potential (PJ/year)	Total Primary Energy Potential (PJ/year)	Converted 40% to Advanced Biofuel (PJ/year)
Indonesia	2 505	638	1 645	395	5 183	2 073
Malaysia	179	190	420	187	976	390
Philippines	770	1 031	1 021	55	2 877	1 151
Thailand	1 635	518	849	191	3 193	1 277
Viet Nam	942	436	962	74	2 414	966
REGION	6 031	2 813	4 897	903	14 644	5 858

BOOSTING BIOFUELS

Sustainable Paths
to Greater Energy Security

Biofuel Potential in Southeast Asia:

Raising food yields,
reducing food waste
and utilising residues



IRENA Renewable Energy Market Analysis Series

- Highly dynamic regional markets and continuous process of calibration underway of policies as well as financing frameworks.
- Up-to-date market information sought by stakeholders on state of regional and national markets and opportunities.
- Analysis of renewable energy resources, costs and benefits (e.g., jobs, incomes) to be factored into decision making.
- Contextualising the role of renewable energy in broader energy sector and economy development strategies.
- Highlighting regional synergies and deployment barriers along with best practice solutions.



Macro-economic overview

Energy sector landscape

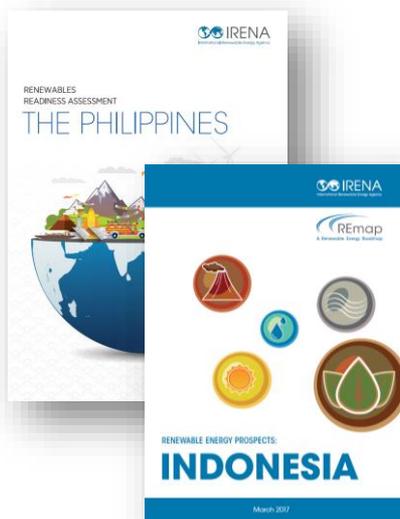
Renewable energy landscape

Policy framework

Investment framework

In-focus discussion

IRENA Renewable Energy Market Analysis: South-East Asia



Country-level engagement

Regional analysis and roadmaps



Thank you!
Nicholas Wagner
nwagner@irena.org

Divyam Nagpal
DNagpal@irena.org