



Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

Sources of Climate Finance in the ASEAN

Presented at the

Technical Workshop on Climate Finance in the Association of Southeast Asian Nations (ASEAN)

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By

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Outline

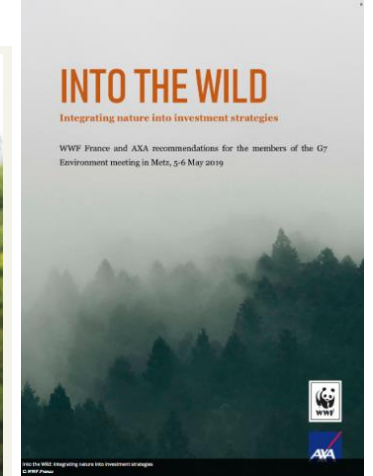
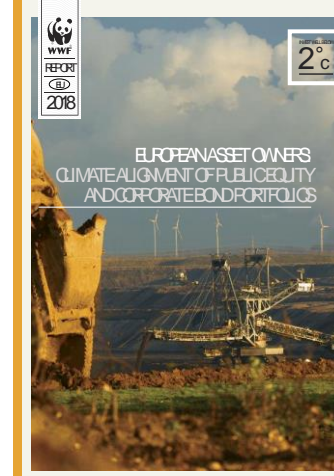
- What we do
- State of global climate finance
- State of global New Renewable Energy (NRE) finance
- NRE Finance in ASEAN
- Finance actors, instruments, policy drivers
- Conclusions

Table 2: Summary of science-based criteria, tools and methodologies for assessing environmental risks

ORGANIZATIONS	NAME	DESCRIPTION	ISSUE ADDRESSED
	Global Forest Watch / Global Forest Watch Pro	Assesses and monitors deforestation and fire risk based on user uploaded locations of concessions and other physical assets	 DEFORESTATION, BIODIVERSITY LOSS, WORLD HERITAGE SITES
	WWF-SIGHT Analytics	Offers overlays of protected areas such as World Heritage Sites and Key Biodiversity Areas with user uploaded locations of concessions or other physical assets	
	Paris Agreement Capital Transition Assessment (PACTA)	Uses asset-level data with known capital expenditure plans to assess investor portfolio alignment with International Energy Agency technology/fuel mixes associated with different climate scenarios	 CLIMATE CHANGE
 	Science Based Targets initiative (SBTi)	Helps corporations identify pathways and set targets for decarbonization that are aligned with emissions reductions required to achieve a well-below 2°C warming scenario Methodology under development for financial institutions	
	WWF Water Risk Filter	Assesses exposure to different types of water risk based on user uploaded asset location data	 WATER
	WRI Aqueduct		
	Corporate Credit Risk		 WATER
	Drought Tool		
	Exploring Opportunities Exposure		 MULTIPLE
	Soft Carbon Platform		
MULTI-STAKEHOLDER	Sustainable Certification		

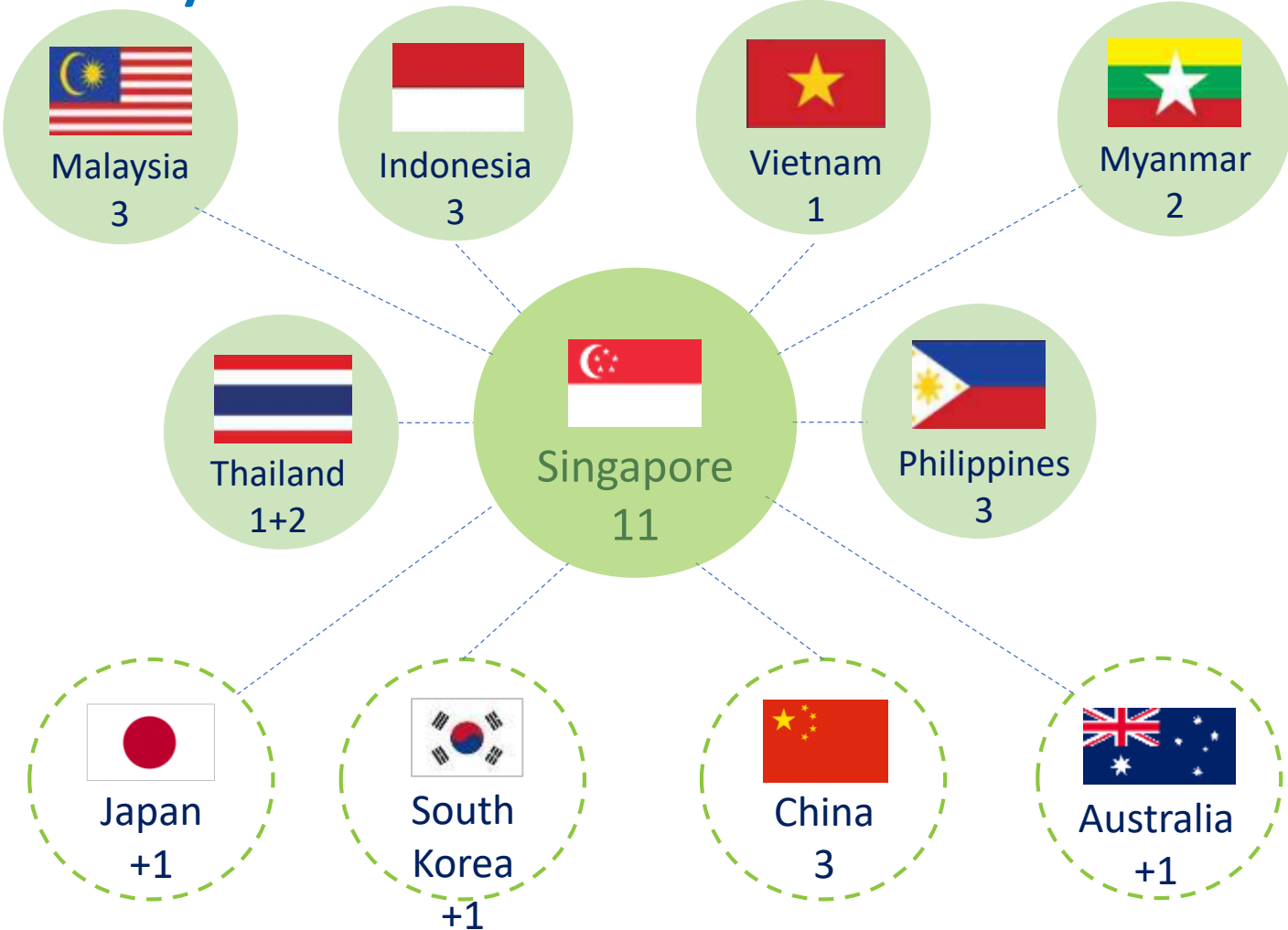


What we do



WWF Sustainable Finance presence across Asia

supported by WWF SG



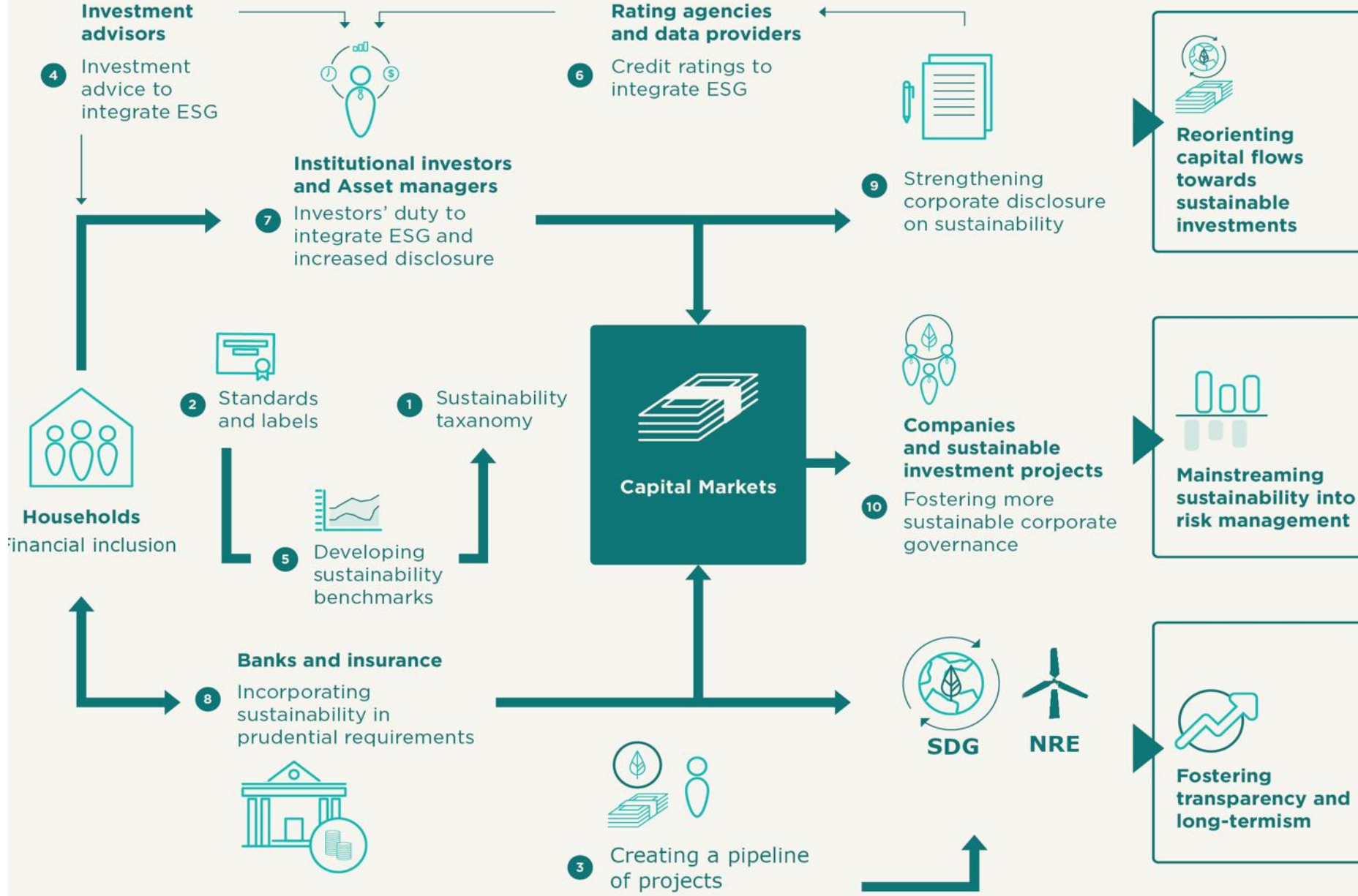
11 in Singapore supporting 15 in ASEAN

Expansion into North Asia

Nearly 80 colleagues globally

26+ dedicated sustainable finance staff

SUSTAINABLE FINANCE ROADMAP : EVERYONE HAS A ROLE



- ## ACTION POINTS
1. Build project pipeline
 2. Blended finance facility
 3. Taxonomy and green tagging
 4. Capacity building / R&D
 5. ESG in credit risk rating

Review of Literature

**Global Climate Finance:
An Updated View 2018**

November 2018



CATALYZING GREEN FINANCE
A CONCEPT FOR LEVERAGING BLENDED
FINANCE FOR GREEN DEVELOPMENT



**RENEWABLE ENERGY
MARKET ANALYSIS**

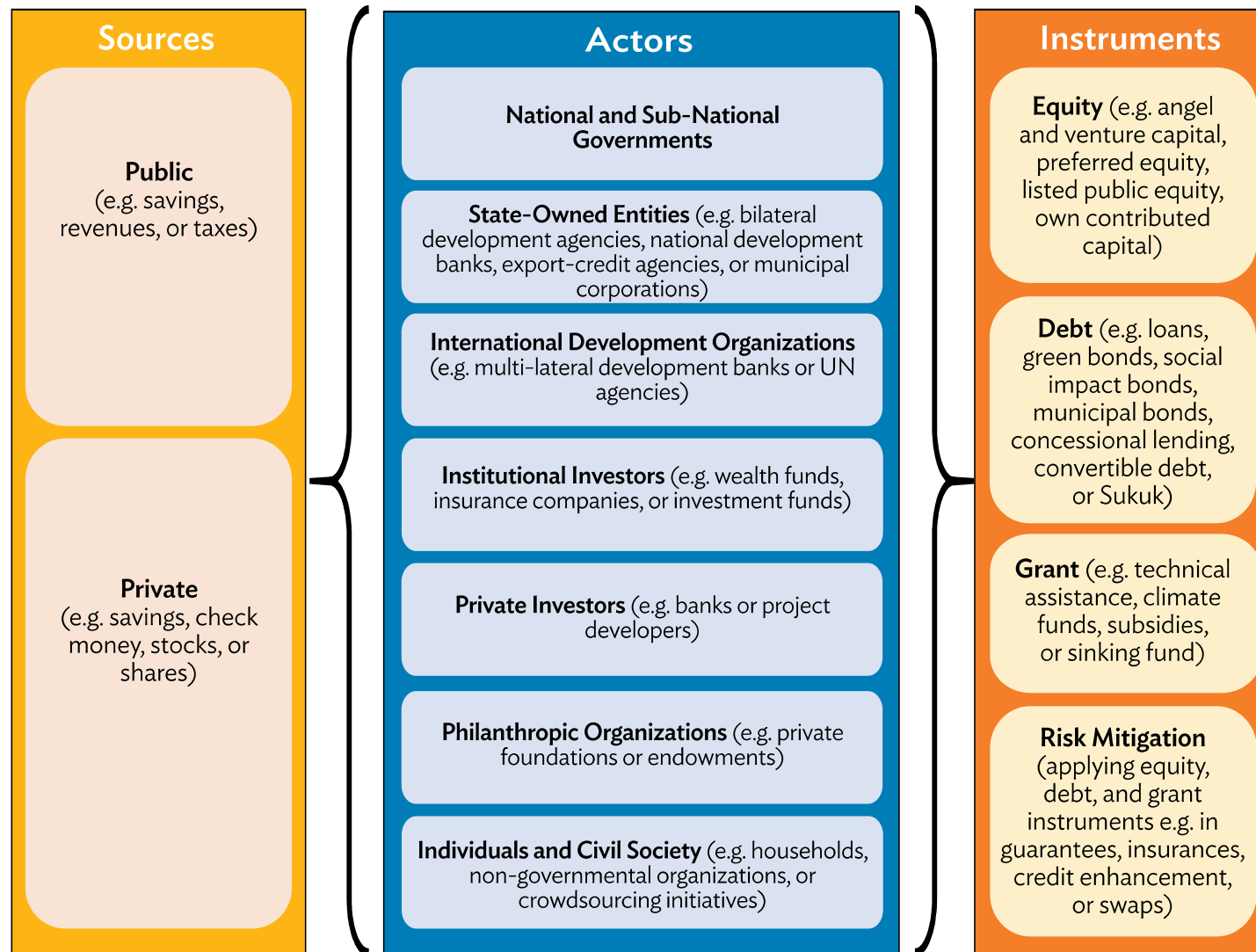
SOUTHEAST ASIA



ASIAN DEVELOPMENT BANK



Figure 16: Simplified Overview of Public and Private Infrastructure Finance



Source: Adapted from New Climate Economy. 2016. The Sustainable Infrastructure Imperative: Financing for Better Growth and Development. The 2016 New Climate Economy Report. Washington D.C./London (World Resources Institute/Overseas Development Institute). Figure 5: Sources of Infrastructure Finance. p. 30; UNEP. 2014. Demystifying Private Climate Finance. Geneva.

Figure 5: Global climate finance flows along their life cycle in 2015 and 2016. Values are average of two years' data, in USD billions.

LANDSCAPE OF CLIMATE FINANCE IN 2015/2016

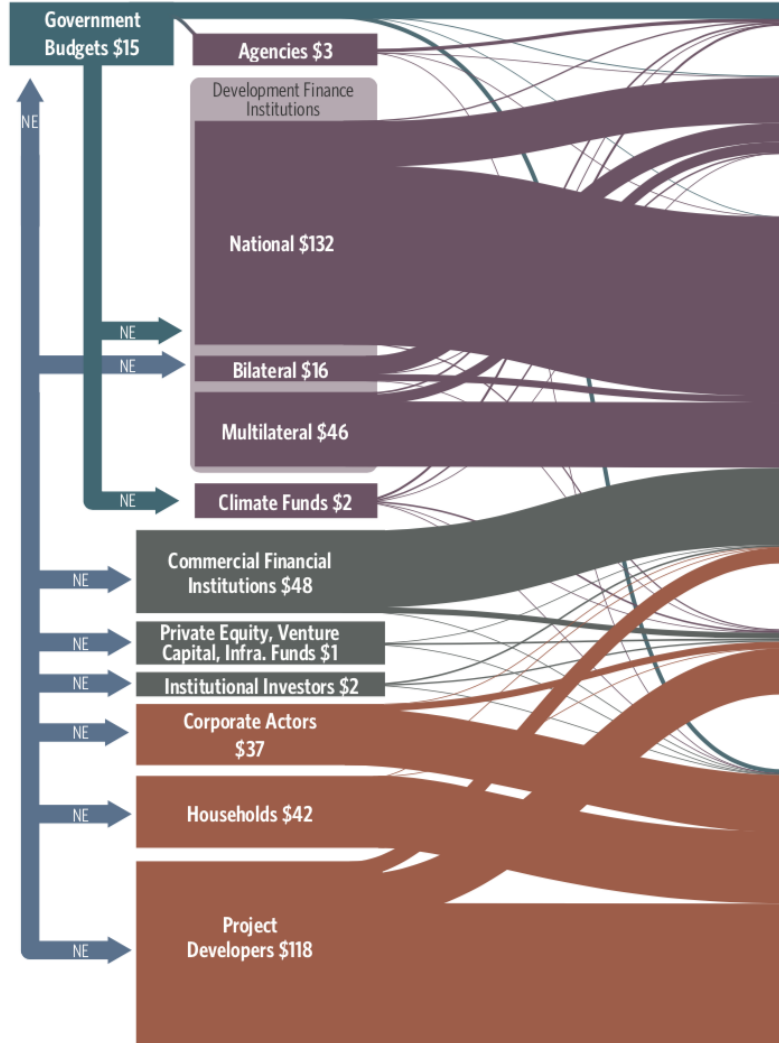
Global climate finance flows along their life cycle in 2015 and 2016. Values are average of two years' data, in USD billions.

463 BN USD ANNUAL AVERAGE



SOURCES AND INTERMEDIARIES

Which type of organizations are sources or intermediaries of capital for climate finance?



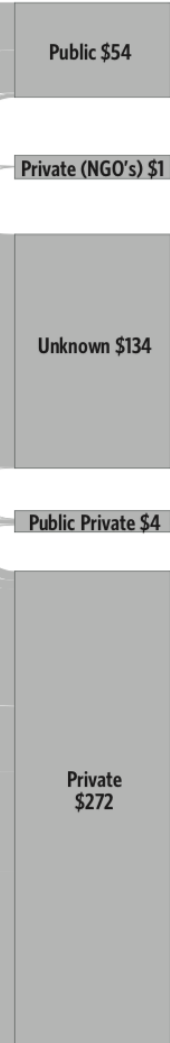
INSTRUMENTS

What mix of financial instruments are used?



RECIPIENTS

Does climate finance go through public or private channels?



USES

What types of activities are financed?



Source: CPI (2018)

KEY

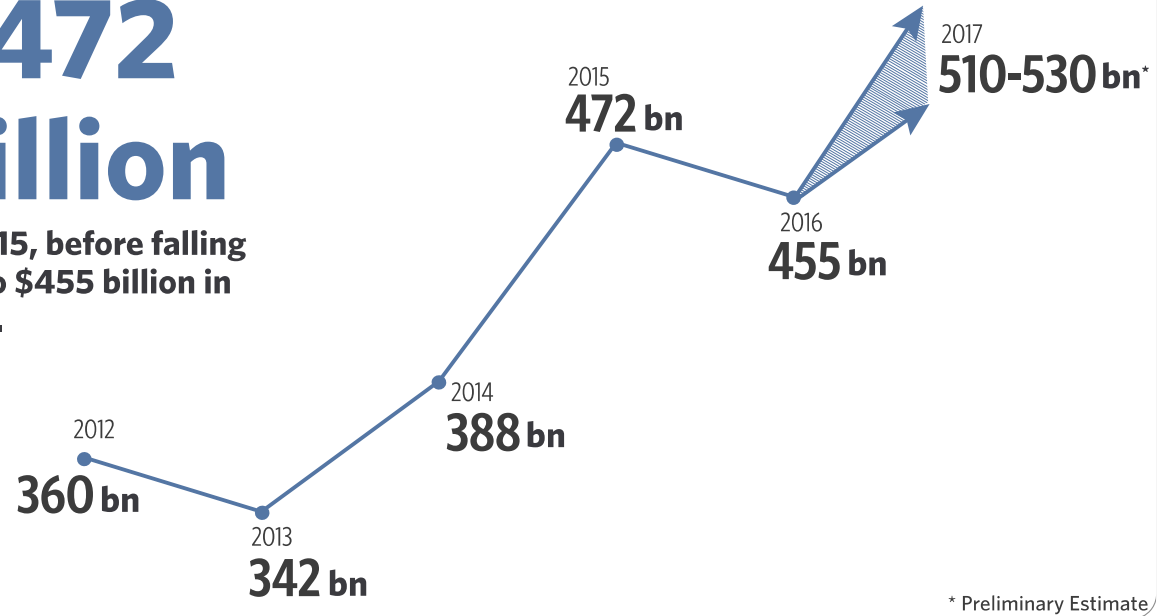
- PUBLIC MONEY
- PRIVATE MONEY
- PUBLIC FINANCIAL INTERMEDIARIES
- PRIVATE FINANCIAL INTERMEDIARIES
- FINANCE FOR INVESTORS & LENDERS
- NE: NOT ESTIMATED

ACTORS	2015	2016	2015-2016 AVERAGES
PRIVATE	267	230	249
COMMERCIAL FI	54	42	48
CORPORATE ACTORS	46	28	37
HOUSEHOLDS	39	44	42
INSTITUTIONAL INVESTORS	3	2	2
PRIVATE EQUITY, VENTURE CAPITAL, INFRASTRUCTURE FUNDS	2	1	1
PROJECT DEVELOPERS	124	113	118
PUBLIC	205	224	215
GOVERNMENTS AND THEIR AGENCIES	17	19	18
CLIMATE FUNDS	2	3	2
PUBLIC FI - BILATERAL	17	14	16
PUBLIC FI - MULTILATERAL	44	48	46
PUBLIC FI - NATIONAL	124	140	132
TOTAL	472	455	463

Global climate finance flows surged to

\$472 billion

in 2015, before falling 3% to \$455 billion in 2016.



Source: CPI (2018)

Table A.2 – Breakdown of global climate finance by sectors (USD bi

Source: CPI (2018)

SECTORS	2015	2016	2015-2016 AVERAGES
ADAPTATION	22	22	22
(OTHER) DISASTER RISK MANAGEMENT	3	3	3
AGRICULTURE, FORESTRY, LAND-USE, AND NATURAL RESOURCE MANAGEMENT	4	5	5
COASTAL PROTECTION	0.2	0.1	0.2
INDUSTRY, EXTRACTIVE INDUSTRIES, MANUFACTURING & TRADE	0.1	0.1	0.1
INFRASTRUCTURE, ENERGY AND OTHER BUILT ENVIRONMENT	1	1	1
OTHERS / CROSS-SECTORAL	2	3	2
POLICY AND NATIONAL BUDGET SUPPORT & CAPACITY BUILDING	0.2	0.4	0.3
WATER AND WASTEWATER MANAGEMENT	11	11	11

MITIGATION	445	427	436
AGRICULTURE, FORESTRY, LAND-USE, AND NATURAL RESOURCE MANAGEMENT	5	4	4
ENERGY EFFICIENCY	26	33	29
LOW-CARBON TECHNOLOGIES	2	2	2
NON-ENERGY GHG REDUCTIONS	0.1	0.1	0.1
OTHERS / CROSS-SECTORAL	6	10	8
POLICY AND NATIONAL BUDGET SUPPORT & CAPACITY BUILDING	0.2	0.3	0.2
RENEWABLE ENERGY GENERATION	321	269	295
SUSTAINABLE TRANSPORT	78	106	92
TRANSMISSION & DISTRIBUTION SYSTEMS	6	3	5
WASTE AND WASTEWATER	1	0.7	0.8
DUAL BENEFITS	5	6	5
TOTAL	472	455	463

Table A.5 – Breakdown of global climate finance by region of destination (USD billion)

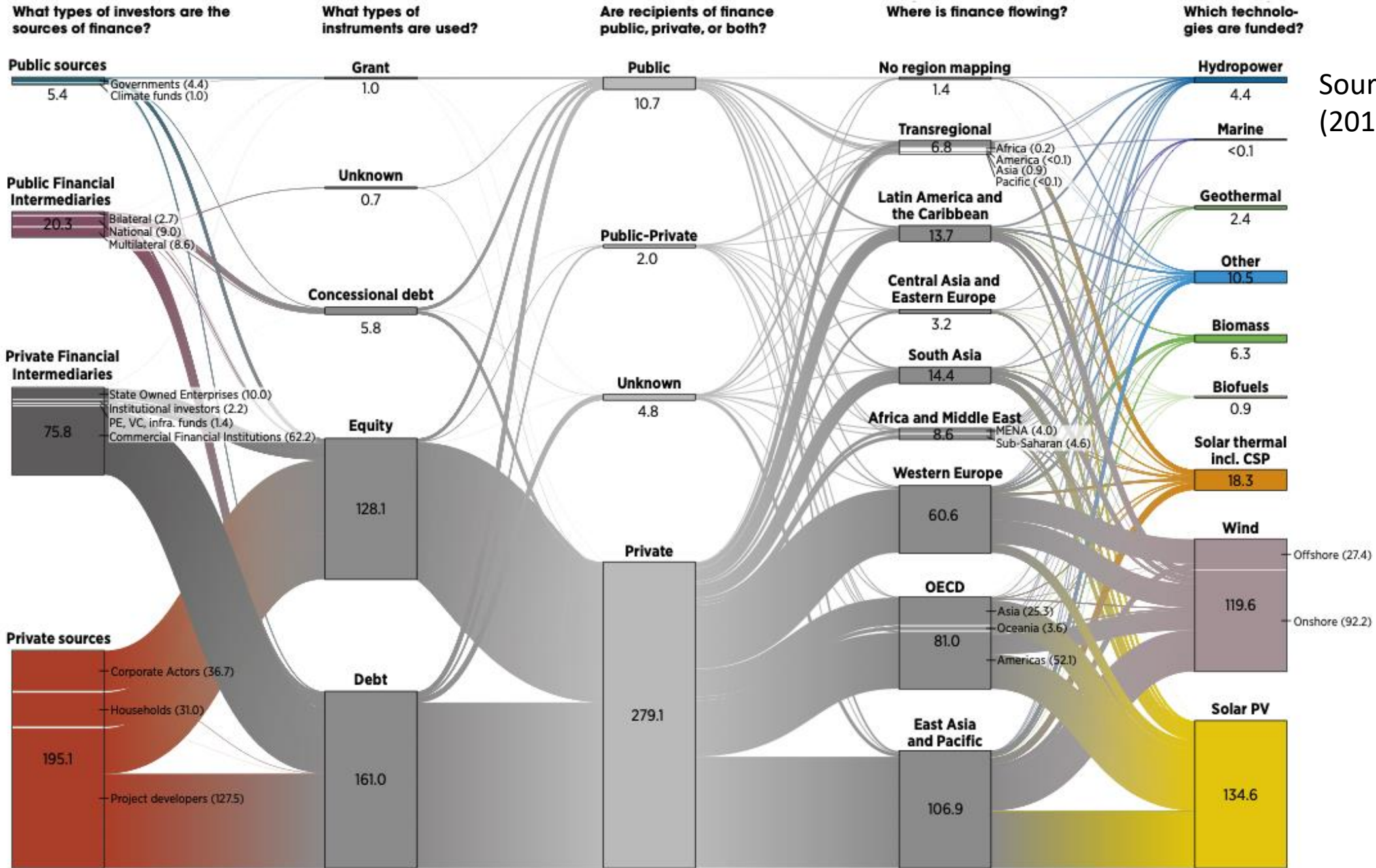
REGION	2015	2016	2015-2016 AVERAGES
NON-OECD	270	269	270
CENTRAL ASIA AND EASTERN EUROPE	11	8	10
EAST ASIA AND PACIFIC	175	184	180
LATIN AMERICA AND THE CARIBBEAN	32	20	26
MIDDLE EAST AND NORTH AFRICA	8	7	8
SOUTH ASIA	20	24	22
SUB-SAHARAN AFRICA	13	12	12
TRANSREGIONAL	12	13	13
OECD	202	186	194
AMERICA	54	59	56
JAPAN, KOREA AND ISRAEL	36	17	26
OTHER OCEANIA	3	5	4
WESTERN EUROPE	109	105	107
TOTAL	472	455	463

Source: CPI (2018)

Table A.6 – International and domestic climate finance flows (USD billion)

ORIGIN	2015	2016	2015-2016 AVERAGES
DOMESTIC	382	370	376
NON-OECD	214	214	214
OECD	168	156	162
INTERNATIONAL	90	85	87
FROM NON-OECD TO OTHER NON-OECD	12	10	11
FROM NON-OECD TO OECD	3	3	3
FROM OECD TO OTHER OECD	31	27	29
FROM OECD TO NON-OECD	44	45	45
TOTAL	472	455	463

GLOBAL LANDSCAPE OF RENEWABLE ENERGY FINANCE 2015/2016



Source: IRENA & CPI (2018)

Figure 4: Origin and destination of climate finance in 2015 and 2016 (USD billion, average)

Source: IRENA & CPI (2018)

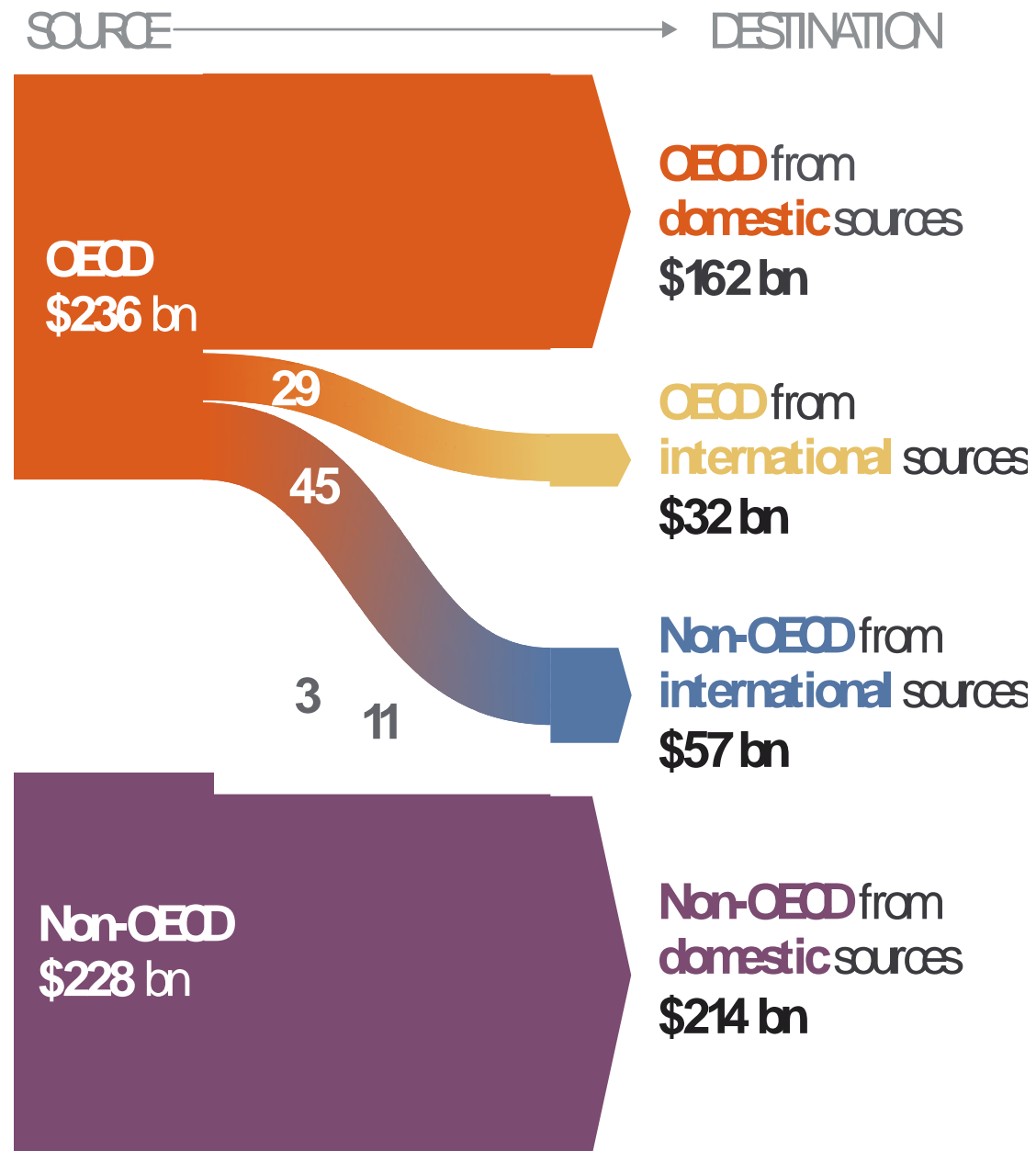
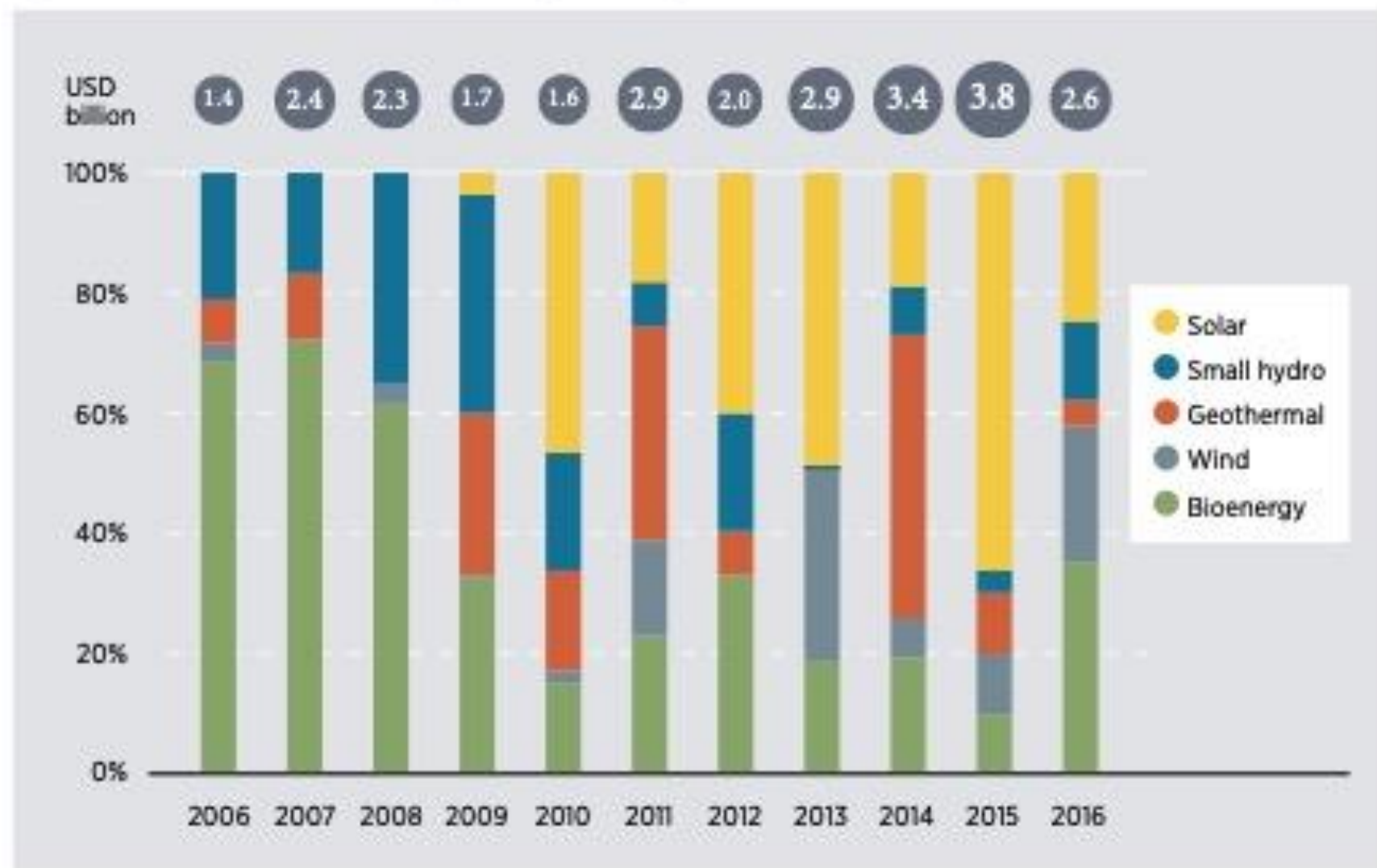


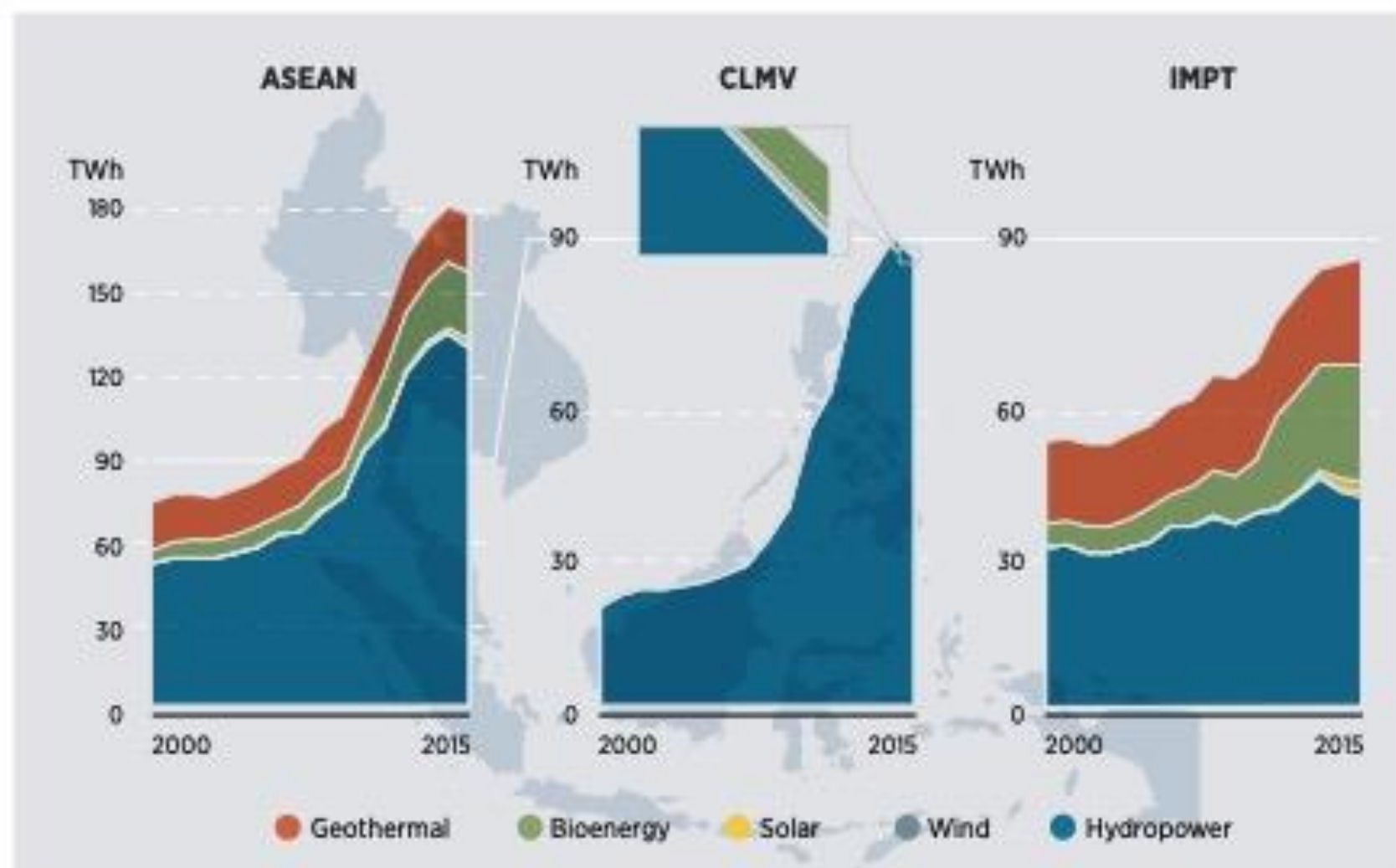
Figure ES.6 Investment in renewable power by technology, 2006–16 (USD billion)



Source: Based on BNEF, 2017.

Note: Based on power sector asset finance data for Indonesia, Malaysia, the Philippines, Singapore, Thailand and Viet Nam.

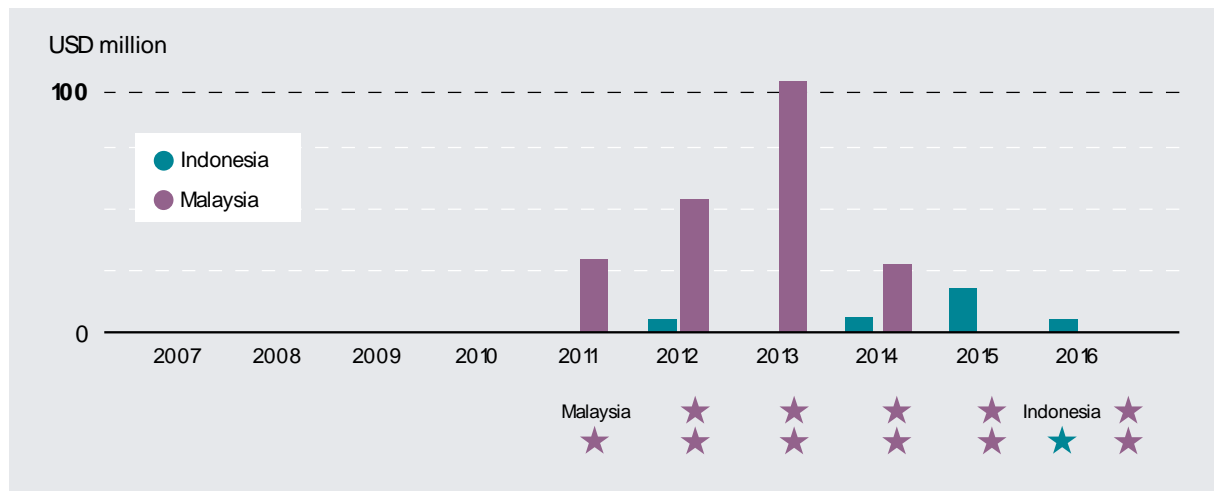
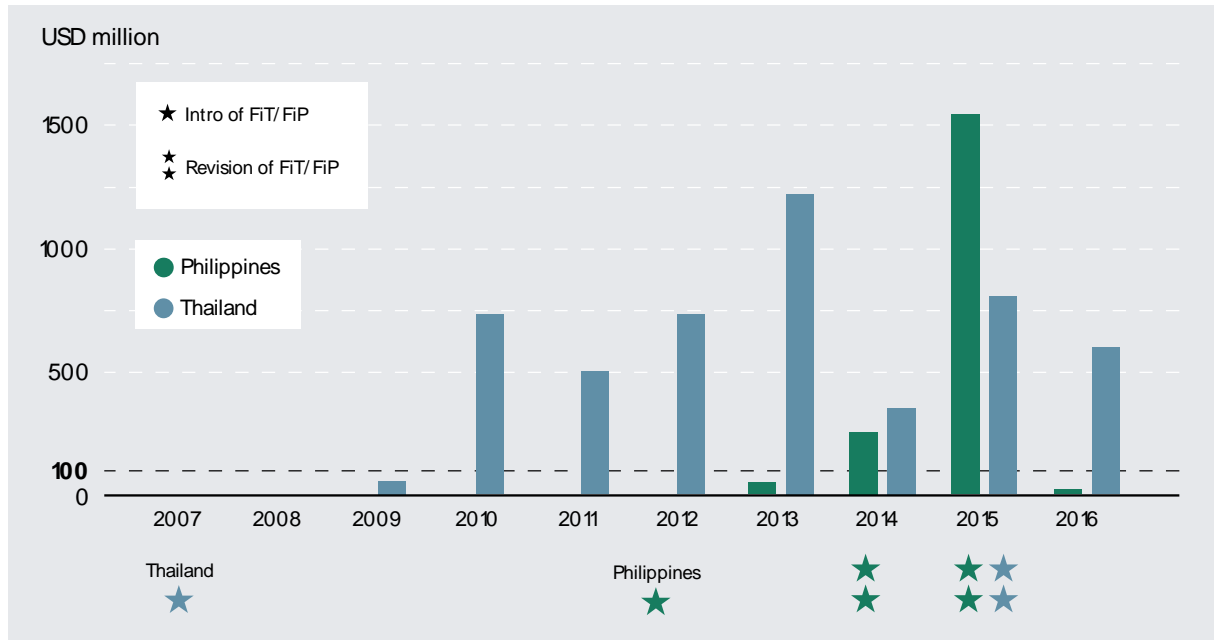
Figure ES.4 Renewable electricity generation in Southeast Asia, 2000–2015 (TWh)



Source: Based on IRENA, 2017f

Note: CLMV comprises Cambodia, Lao PDR, Myanmar and Viet Nam; IMPT comprises Indonesia, Malaysia, the Philippines and Thailand.

Figure 4.1 Investments in solar PV in the Philippines, Thailand, Indonesia and Malaysia, as a result of FITs, 2007-17



Subsidies in ASEAN via Feed-in Tariffs saw growth in PV investments from 2010 onwards

Source: Investment data from BNEF, 2017.
Note: FIT=feed-in tariff ; FIP=feed-in premium.

Figure 3.3 Investment costs of selected renewable energy technologies

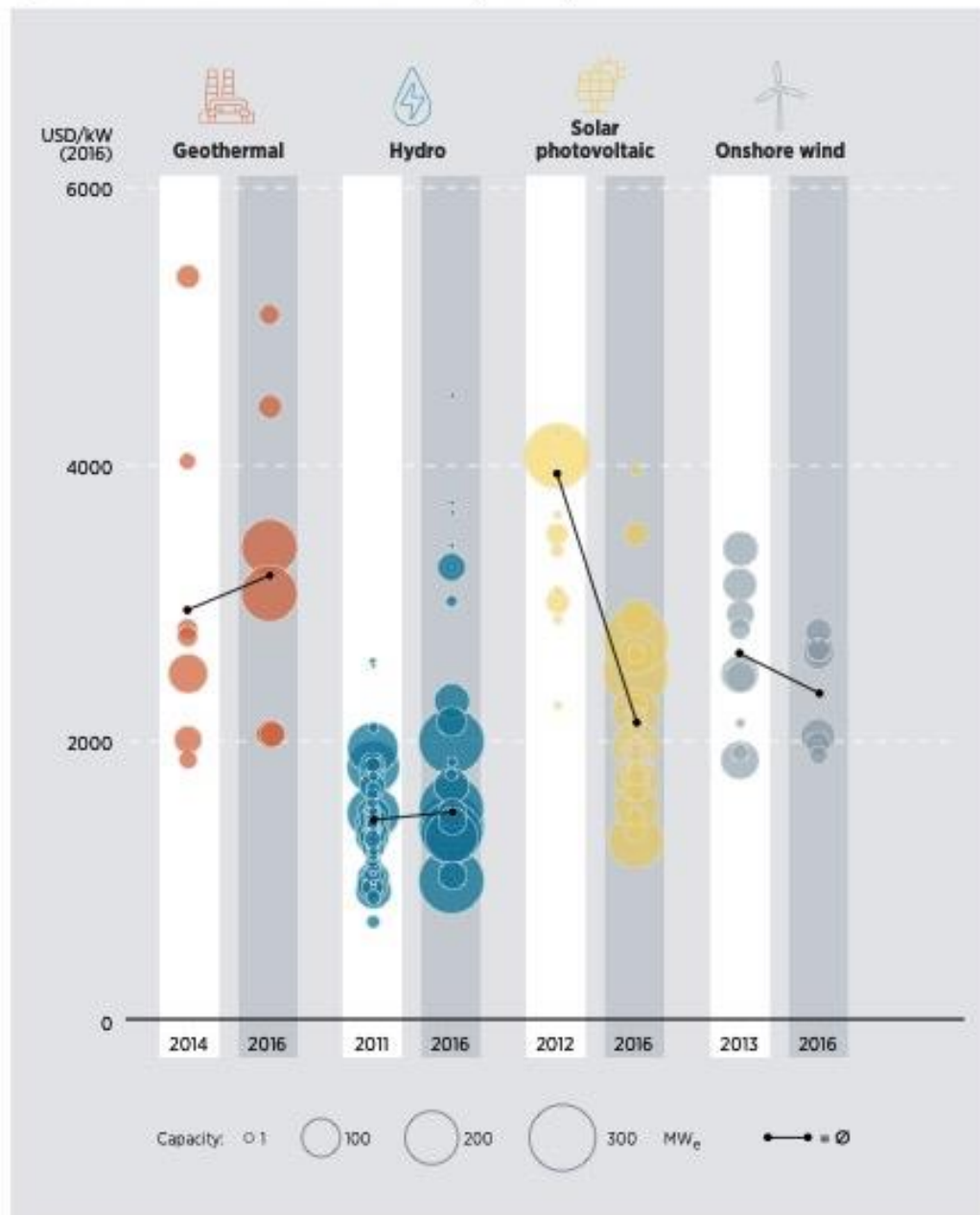
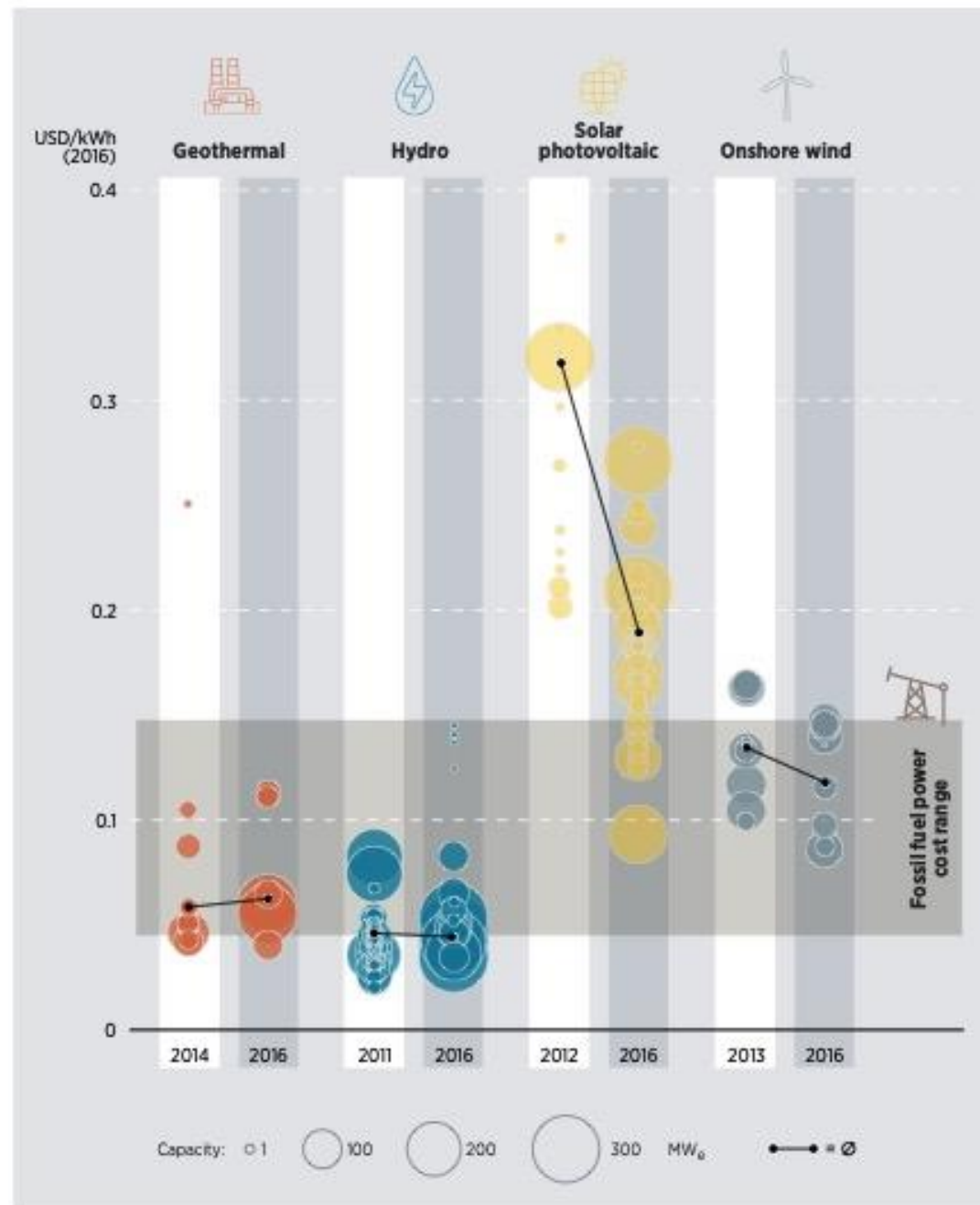
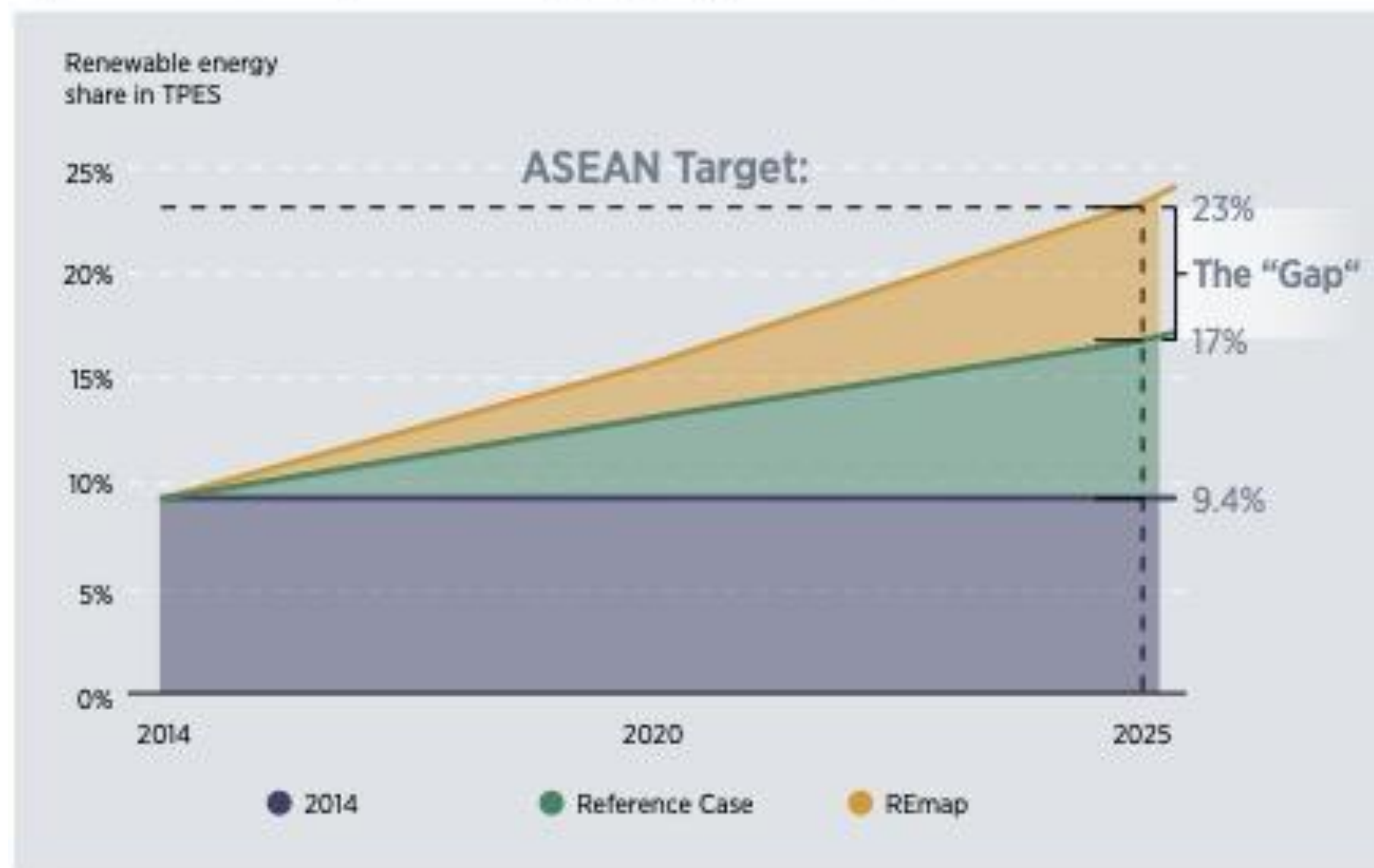


Figure 3.4 LCOE of selected renewable energy technologies



Note: kW = kilowatts; MW_e = megawatts (electric).

Figure 3.10 Renewable energy share in ASEAN primary energy mix in 2025 and 2030



Source: IRENA and ACE, 2016

INT'L PUBLIC FINANCE INSTITUTIONS

- International public finance institutions
 - Bilateral and multilateral
 - Most active in early phases of RE development until PVC and Wind were mainstreamed
 - Still active in Mekong region and Indonesia
 - capacity and awareness building, technology transfer programmes, feasibility studies, as well as technical co-operation with other donor-funded public agencies,
 - Technical cooperation


Figure 5.5 Cumulative investment of selected development finance institutions in Southeast Asia, 2009–16 (USD billion)



Source: IRENA, 2017h.

Domestic public finance institutions

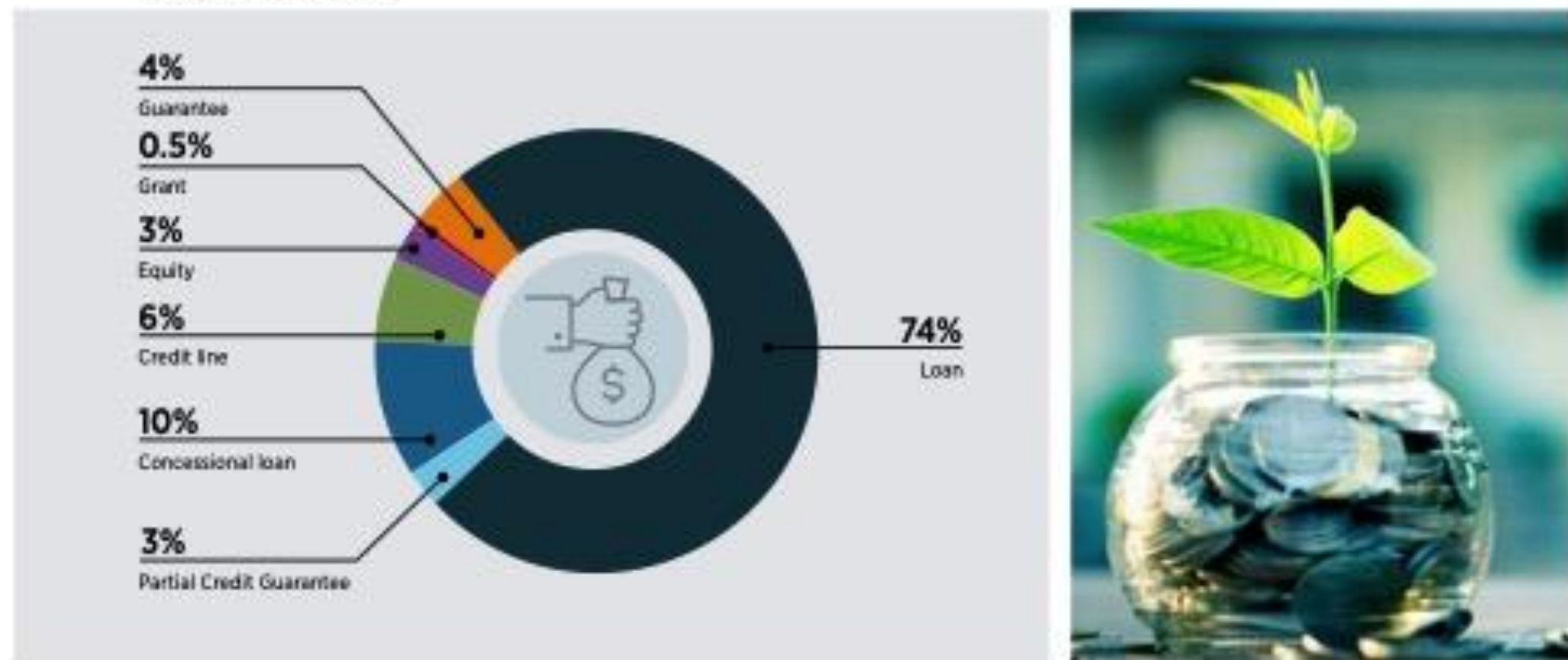
Table 5.2 Examples of renewable energy national financing vehicles in Southeast Asia

Country	Name of agency
 Thailand	Office of Natural Resource and Environmental Policy and Planning (ONEP)
 Indonesia	PT Sarana Multi Infrastruktur (SMI) and Indonesia Climate Change Trust Fund (ICCTF)
 Lao PDR	Laos Energy Promotion Fund (LEPF) and Energy Access Solar-Home-Systems (SHS) Fund Environment Protection Fund (EPF)
 Malaysia	The Malaysia Green Technology Corporation (GreenTech Malaysia)
 Cambodia	National Council for Sustainable Development (NCSD)
 Viet Nam	Vietnam Development Bank (VDB)

Source: ONEP, n.d.; ICCTF, n.d.; VDB, n.d.; GreenTech Malaysia, n.d.; NCSD, n.d.; Mayer Brown JSM, 2017; GIZ, 2014.

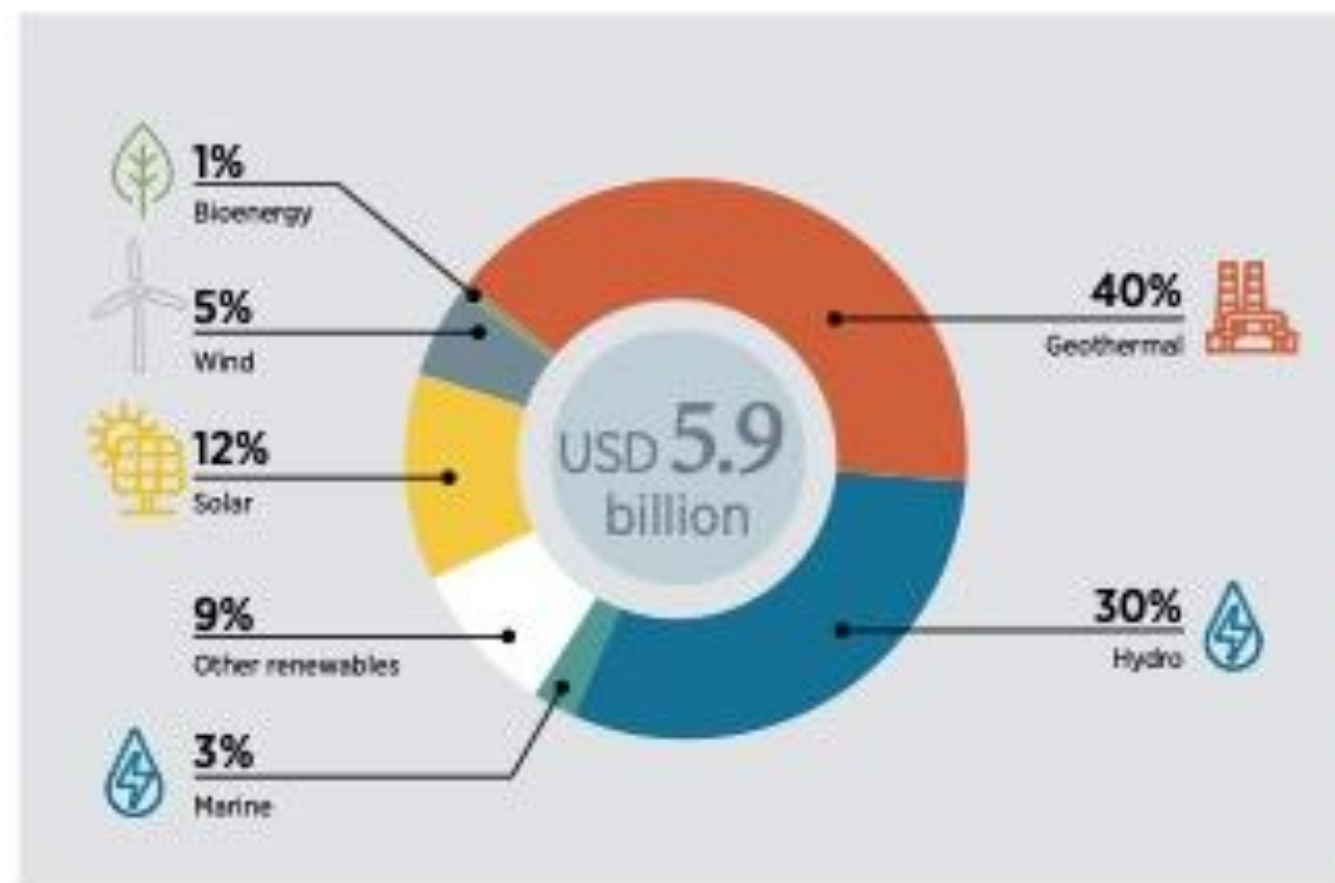
Philippines Development Bank of the Phil.

Figure 5.6 Development banks' cumulative investments in renewable energy in Southeast Asia by type of financial instrument, 2009–16



Source: IRENA, 2017h.

Figure 5.7 Development banks' investments in renewable energy by technology, 2009-16



Source: IRENA, 2017h.

Private equity

Figure 5.4 Total stock market capitalisation and levels of GDP in Southeast Asian countries



Source: World Bank, 2016b and 2016c.
GDP = gross domestic product.

Private Equity & Capital Markets

Table 5.4 Selected renewable energy developers listed on stock markets in Southeast Asia

Country/ stock exchange	Listed renewable energy firms
 Thailand	Superblock Public Company Limited (PCL), Better World Green PCL, Thai Solar Energy PCL, Global Power Synergy PCL, B. Grimm PCL, SPCG PCL, Gunkul Engineering PCL, Energy Absolute PCL, BCPG PCL and Banpu PCL
 Indonesia	PT Terregra Asia Energy
 Philippines	Greenergy Holdings Inc., Pure Energy Holdings Corp Aboitiz, ALSONS, EDC, FirstGen, TransAsia, Ayala, SM
 Malaysia	Future NRG Sdn Bhd
 Singapore	Anwell Technologies Ltd, Renewable Energy Asia Group Ltd, Sunpower Group Ltd

Source: SET, n.d.; IDX, n.d.; PSE, n.d.; Bursa Malaysia, n.d.; SGX, n.d.

DEBT FINANCING BY PRIVATE FINANCE INSTITUTIONS (Foreign)

Table 5.3 Examples of commercial banks active in renewable energy in Southeast Asia (**continued**)

Renewable energy investment profile and benchmark transactions	
INTERNATIONAL BANKS	
Standard Chartered Bank	Standard Chartered Bank and a Malaysian company sponsored by SunEdison, together with the Malaysia-based Sun Energy Ventures, provided loan facilities amounting to MYR 134 million (USD 41 million) for two utility-scale solar projects (10 MW and 5 MW) in Malaysia in 2013.
Rabobank	Rabobank's asset management arm, Robeco, is one of the founders of Asia Climate Partners (ACP), together with ORIX and the ADB. ACP is a specialist renewable energy investment fund with an Asia mandate.
Macquarie Capital	Macquarie has advised, managed and invested in 2.5 GW of renewable energy in Asia. STEAG Energy Services GmbH and Macquarie recently founded a joint development and investment platform, which is intended to design, construct and operate energy projects in Southeast Asia, predominantly in Indonesia, the Philippines, Malaysia and Thailand.
Australia and New Zealand Banking Group (ANZ)	ANZ, together with lead managers Nord LB, DZ Bank, and ING Bank acted as mandated lead arranger for a syndicate of banks providing a USD 315 million debt portion of funding for the Philippines' largest wind farm, the Burgos Wind Farm project. The funding consists of three 15-year tranches: a Philippine peso (PHP) tranche (provided by domestic bank syndicate members), making up 40% of the total debt portion, and two USD tranches that combine to make up the remaining 60%.

Source: Kasikornbank, 2016; Pande, 2013; Private Equity Wire, 2014; Rappler, 2015; STEAG GmbH, 2016; SCB, 2012; Das, 2011; Bank Mandiri, 2014; Reuters, 2017.

Note: MYR = Malaysian ringgit; PHP = Philippine peso.

DEBT FINANCING BY PRIVATE FINANCE INSTITUTIONS (local)

Table 5.3 Examples of commercial banks active in renewable energy in Southeast Asia

Renewable energy investment profile and benchmark transactions	
DOMESTIC BANKS	
Kasikorn Bank (Thailand)	This is the first commercial bank in the ASEAN to be selected as a member of the Dow Jones Sustainability Indices (DJSI) World Index and DJSI Emerging Markets Index. In its recent deal in late 2016, the bank provided financial support of USD 50 million to Sermuang Power Corporation involving Thailand's 40 MW solar power plant partly owned by the company.
Siam Commercial Bank (SCB) (Thailand)	In 2012, SCB acted as financial adviser and lead arranger for the construction of three large-scale solar power plants with a total capacity of 270 MW, helping Thailand to secure its position as a solar energy leader in Southeast Asia. SCB has financed the majority of the wind capacity in Thailand with the 450 MW project by the Wind Energy Holding under construction.
BDO Unibank (Philippines)	The bank has an exposure of over USD 500 million to the renewable energy sector in the Philippines. San Carlos Sun Power Incorporated partnered with BDO Unibank for PHP 3.7 billion (USD 78.25 million) to finance its solar power project in Negros Occidental.
The Bank of the Philippine Islands (Philippines)	The first in the Philippines, this bank works in close partnership with the International Finance Corporation (IFC) in renewable energy investments. The bank financed the renewables project of Raslag Corp. to expand its existing 10 MW solar power plant (RASLAG 1) to 23.14 MW in the Pampanga area. BPI also participated in the issue of climate bond to fund the Tiwi-MakBan geothermal project in the Philippines.
United Overseas Bank (UOB) (Singapore)	The bank selected an investment approach in the lower-income Mekong countries. It has supported hydropower developer Bitexco Power in Viet Nam and a lighting programme in the Mawlamyine township of Southern Myanmar. In 2017, UOB lent USD 15 million to Sunseap Group for a series of solar projects in Singapore. The projects include the 9.5 MW solar systems at Jurong Port, and 2.4 MW solar systems at the consumer electronics company Panasonic.
Maybank (Malaysia)	The bank has been actively financing renewable energy projects including solar, biomass and hydropower over the past decade, especially in Malaysia and Indonesia. In 2016, it invested in and advised infrastructure projects worth several billions. In 2016, Maybank, together with Middle East & Asia Capital Partners, ADB, IFC and OPIC, launched a ten-year private equity fund investing in projects in the Asia-Pacific region.
Bank Mandiri (Indonesia)	The largest bank in Indonesia in terms of assets, loans and deposits. The bank has played an important role in channeling Agence Française de Développement and ADB-sponsored long-term loan facilities to clean energy projects in Indonesia. In 2013, AFD signed a USD 100 million financial commitment with Bank Mandiri to finance clean and renewable energies in Indonesia. It was the second environmental credit line allocated to the bank following an initial operation in 2010. The first financed power generation capacity of over 90 MW, included hydro and biomass power.

Blended Finance

- Private sector capital development
 - Private Financing Advisory Network – USD 700 M for clean energy projects
 - Leading Private Infrastructure Fund est. by ADB – USD 1.5 B from JICA
 - Technical Assistance Grants by USAID Clean Power Asia
- Credit enhancements
 - GuarantCo – USD 13.5M guarantee for Thai Biogas Energy Co., waste to energy projects
 - Viability Gap Funding grant to expand to Mekong
- Bank Mandiri - credit line to finance 90 MW biomass in Indonesia
- Agence Francaise de Developpement – USD 100 M credit for NRE (2016)
- Maybank, ADB, IFC, OPIC et al launched 10-year private equity fund for NRE

Examples of Public-Private Partnerships

- UNESCAP's "Leveraging Pro-Poor Public-Private-Partnerships" for rural electrification in LAO PDR
- Sunseap, entered a 20-year solar PPA with Electricite Du Cambodge (Cambodia's state-run utility), to which the ADB agreed to lend USD 9.2 million to build a 10 MW solar facility.
- Sustainable Development Investment Partnership (SDIP), a collaborative initiative managed by the OECD and the World Economic Forum, to mobilize USD 100 Billion

Green Bonds

- ASEAN Capital Markets Forum of Regulators announced green bond guidelines
- Singapore green bond grant scheme to offset costs up to USD \$74 K,
- USD 74 M bond issued by City Developments Limited Ltd. for energy efficiency,
- Malaysia “green sukuk” worth 250 M MYR
- USD 225 Million peso bond issued by AP Renewables for Geothermal project with partial guarantee from ADB was well received and oversubscribed



Green Bonds

Source: Amatong (2019)

Highlights

- Indonesia, Singapore and Malaysia are the top three countries for labelled green bond issuance
- 81% of ASEAN green bonds, by volume, have an external review, which demonstrates best practice
- Buildings is the largest category financed by green bonds (43% of the market by volume), followed by energy at 32%
- Philippine firms have raised \$1.32 billion USD equivalent across 7 transactions. Notably, 45% of was denominated or linked to pesos.
- A high proportion of the Philippine-related green bonds have been Climate Bonds certified – therefore automatically eligible for ASEAN GBS - but only one, to date, has sought the ASEAN label (RCBC)

Sovereign sukuk and loans fuelling 2018 ASEAN green bond market growth

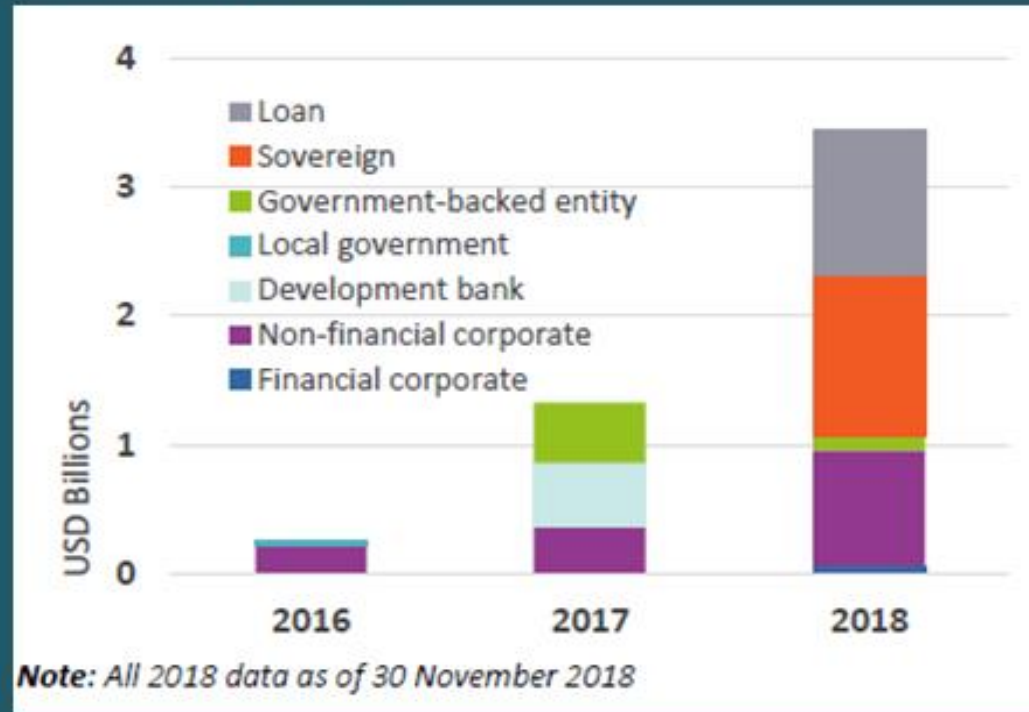
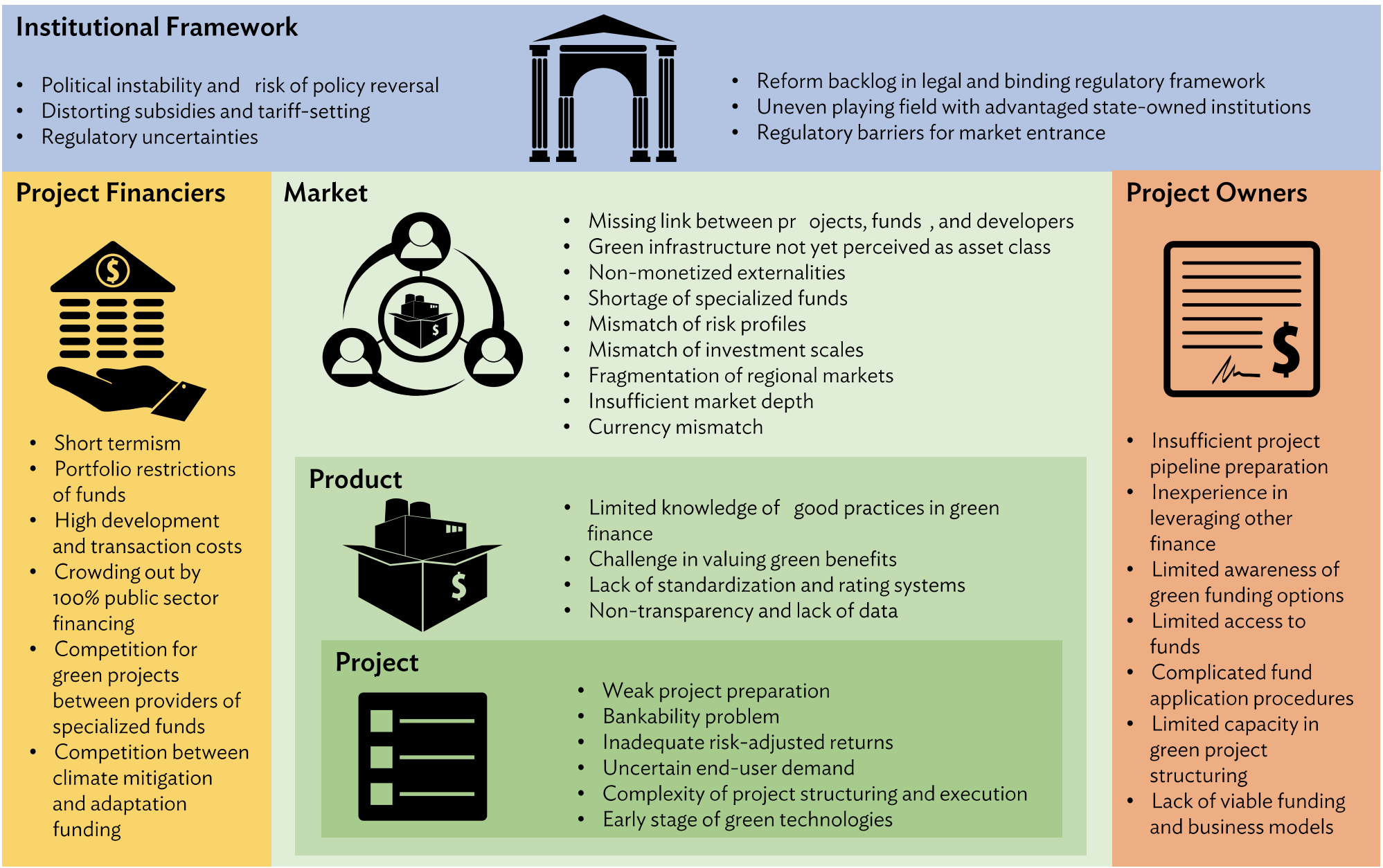


Figure 18: Green Finance Challenges and Constraints



Source: ADB 2017, Catalyzing Green Finance

Conclusions

- Increasing climate finance flows esp. in NRE
- Growing investments in East Asia (ASEAN)
- Flows from OECD into non-OECD
- Role of regulatory policy e.g. FIT, Auctions
- Growing interest in blended finance, Green Bonds
- Challenges and constraints to climate finance