Unlocking Capital for Sustainability

Increasing flows, but sizeable headroom
Main report

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SEA’s Green Economy 2021 Report: Opportunities on the Road to Net Zero

Deep-dive sections

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Defining the Road to Net Zero

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Unlocking Capital Flows

This report

Country insights

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Key messages

Southeast Asian (SEA) investors and financiers are accelerating the integration of sustainability into their investing strategies.

• SEA investor sentiment is shifting along the sustainability adoption spectrum; SEA investors have caught up to the rest of Asia-Pacific in just the last 2 years in terms of integrating sustainability into their investing strategy.

• Private investors and financiers are facing pressure from clients (especially high-net-worth individuals and families) and other stakeholders, and government-linked funds are mobilizing to influence ecosystem-wide change.

As a result, green capital has begun to flow in the region, but there is still much headroom to grow.

• Green fundraising has been on a strong upward trajectory since activity began ~3-5 years ago, but there is big headroom to grow.
  - In 2020: strong growth across debt (~$12B, 151% growth p.a. since 2016), IPOs (~$1.4B, 45% growth p.a. since 2016), private equity (~$0.5B, 53% growth p.a. since 2017), and public funds (~$0.6B, 40% growth p.a. since 2018).
  - A growing proportion of capital is being deployed into green businesses or assets, though growth is less consistent.
  - In 2020: ~11% corporate (~$4.9B, 22% growth p.a. since 2016), ~19% PE/VC (~$1.9B, 50% growth p.a. since 2016), and ~36% infrastructure capital (~$1.9B, -18% decline p.a. since 2016) were deployed into green assets.

There are promises of the road ahead to full potential.

• While a promising start, much more is needed to address the scale of capital required for transition: ~$2T needed to develop sustainable infrastructure from 2021 to 2030.

• There is much room to grow. SEA green debt levels lag global GDP contribution (~2% vs. ~4% respectively), and public funds’ assets under management (AUM) is a sliver of global’s (~0.1%).

• Further, development and nongovernmental players are stepping up climate financing in SEA, utilizing creative instruments such as blended financing to catalyze more capital, including from the private sector.

• Energy transition, sustainable buildings and construction, and waste and water are the key sectors attracting capital today, while nature-based solutions and sustainable agri-food are nascent but promising areas, with regional developments supportive of the investment thesis.

• Several barriers exist today that impede growth in sustainable capital flow: macro challenges, an immature ecosystem, low quality and high risk of investments, and organizational hurdles.

• Critical enablers are required to scale up green finance in the region: strong government policies and incentives, digital/data innovation to reduce frictions, blended financing, established ecosystem fundamentals, and fit-for-purpose fund allocation and operating principles.
Investors are moving along the sustainability spectrum

SEA investors have caught up with the rest of Asia-Pacific in terms of sustainability integration into their investment strategies in just the last 2 years.

Notes: 1. Total does not add up to 100% as funds may adopt multiple strategies; 2. Asia-Pacific countries include Greater China, India, Japan, Australia, New Zealand, and South Korea

Sources: Bain Asia-Pacific PE Survey 2019, Bain Asia-Pacific PE Survey 2021
UNLOCKING CAPITAL

Shifting investment strategies and ethos

Multiple sources of pressure to adopt sustainable investing

**Clients/LPs**

62% SEA PE/VC Funds have adopted sustainability practices in response to LP pressures

"The new generation of SEA high-net-worth individuals is driving demand for sustainability"  
SEA Strategy Head, International Banking Group

A lot of this is driven by LPs... who are increasingly asking for 'green' fund-level investments and co-investments

SEA Senior VP, International PE Fund

**Regulators**

~4.5x increase in SEA companies supporting TCFD since 2019 (20 vs. 90 today)

~1.7x increase in UN PRI signatories in SEA since 2019 (40 vs. 67 today)

"G7 has made climate risk disclosures mandatory... similar conversations are starting to happen around SEA"

Head of Sustainability, SEA Exchange

**Reputational risks**

71% SEA PE/VC Funds have adopted sustainability practices to mitigate reputational risk

"Investee companies... (with negative environmental impact) could pose reputational risk to asset managers, and this in turn, is a business risk"

Temasek aims to halve portfolio GHG emissions by 2030 in support of Singapore's Green Plan

INA to invest in renewable energy sector in line with Indonesia’s clean energy ambitions

Employee’s Provident Fund (Malaysia’s national pension fund) aims to be Net Zero by 2050

Notes: 1. Limited partners; 2. Investors surveyed (in 2021) include portfolio managers, CFOs, CEOs, ESG specialists, and investment specialists working in global financial services firms, commercial banks, asset and wealth management funds, insurance companies; 3. Task Force on Climate-Related Financial Disclosures; 4. United Nations Principles for Responsible Investment; 5. Group of Seven; 6. Greenhouse gases

Sources: Eco-Business; CNBC; Company websites; Bain Asia-Pacific Private Equity Survey 2021; Bursa; Fund Selector Asia; EIU; TCFD; UN PRI; Business Times; S&P Global; MAS; Industry interviews
Growing recognition that sustainability is associated with improved financial returns

Upside potential driven by value creation from efficiencies, differentiated products, business models, and value preservation from risk mitigation as externalities are priced in

Private markets:

Median gross IRR\(^1\) for buyout growth deals exited 2015-20

- **Upper quartile**: 47%
- **Lower quartile**: 24%
- **Median**: 21%

Public markets:

Excess returns (% pt.) of MSCI Socially Responsible Investing (SRI) index compared to MSCI All Country World Index (ACWI)\(^2\)

- **2016**: 0.3%
- **2017**: 0.6%
- **2018**: 2.3%
- **2019**: 1.9%
- **2020**: 4.6%

Notes:
1. Internal rate of return;
2. MSCI ACWI captures large and mid-cap representation across 23 Developed Markets (DM) and 27 Emerging Markets (EM) countries. MSCI SRI includes top 25% ESG performers across sectors.

Sources: CNBC; INEA; ESG Today; The Edge; MSCI
New opportunities are arising from increasing regulatory support

State machinery mobilizing capital support...

<table>
<thead>
<tr>
<th>Investments</th>
<th>Green and Sustainability-Linked Loan Grant Scheme by MAS¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>(grants, co-investments)</td>
<td>World’s first grant scheme to support green and sustainability-linked loans (launched in 2020), which enhances the Sustainable Bond Grant Scheme (SBGS)</td>
</tr>
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...spurring investors and businesses to act

<table>
<thead>
<tr>
<th>Investments</th>
<th>Bio-Circular-Green (BCG) economy model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Government tax exemptions and other incentives for green investments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Investments</th>
<th>Feed-in-tariff (FiT) for Solar Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20-year purchase price guaranteed by government for solar power sold to national electricity grid</td>
</tr>
</tbody>
</table>

| Notes: 1. Monetary Authority of Singapore | Sources: ADB, ASEAN, Business Times, CF, Bangkok Post, WEF; The Asset, The Straits Times, MAS |

<table>
<thead>
<tr>
<th>Investments</th>
<th>Green/sustainable bonds issued</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>As of 2020</td>
</tr>
<tr>
<td></td>
<td>$8 billion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Investments</th>
<th>Green/sustainable bonds issued</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In 2020</td>
</tr>
<tr>
<td></td>
<td>&gt;$1.7 billion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Investments</th>
<th>Increase in solar capacity (~9 GW installed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In 2020</td>
</tr>
<tr>
<td></td>
<td>~25x</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Investments</th>
<th>Increase in solar capacity (~9 GW installed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>From surge in solar investments to meet the FiT scheme’s deadline</td>
</tr>
</tbody>
</table>

Notes: 1. Monetary Authority of Singapore

Sources: ADB, ASEAN, Business Times, CF, Bangkok Post, WEF; The Asset, The Straits Times, MAS
Green capital is beginning to flow in SEA, though still at early stage

<table>
<thead>
<tr>
<th>Green fundraising has been on a strong upward trajectory over the last 3-5 years</th>
<th>While share of capital deployment into green assets is increasing, overall growth is less strong compared to fundraising</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capital raised</strong></td>
<td><strong>Annual growth</strong></td>
</tr>
<tr>
<td><strong>2020</strong></td>
<td><strong>2020</strong></td>
</tr>
<tr>
<td>Debt</td>
<td>$11.9 billion debt issued</td>
</tr>
<tr>
<td>IPO</td>
<td>$1.4 billion IPOs</td>
</tr>
<tr>
<td>PE/VC</td>
<td>$0.5 billion funds raised</td>
</tr>
<tr>
<td>Public funds²</td>
<td>$0.6 billion total AUM</td>
</tr>
</tbody>
</table>

Notes: 1. No green funds raised in 2016; 2. Includes funds raising capital for environmental and sustainability objectives; 3. Total value only includes SEA countries with available data for each asset category in SEA; 4. Excludes investments <$15 million; 5. Excludes deals <$10 million. Sources: Bain analysis
Green debt issuance at ~$11.9 billion in 2020, but SEA lags on relative terms

Annual issuance has accelerated since first issuance in 2016
Singapore leads in issuances, with majority allocated to green buildings and infrastructure

Green¹ debt issued in SEA (US$ billion)

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>0.3</td>
<td>1.2</td>
<td>4.1</td>
<td>11.4</td>
<td>11.9</td>
</tr>
</tbody>
</table>

CAGR:²
151%
(since 2016)

In 2020, $11.9 billion issued across:

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Bonds</th>
<th>Loans</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>SG</td>
<td>TH</td>
<td>ID</td>
</tr>
<tr>
<td>Sector</td>
<td>Buildings</td>
<td>Energy</td>
<td>Water</td>
</tr>
</tbody>
</table>

SEA contribution to global in 2020:

<table>
<thead>
<tr>
<th>GREEN DEBT ISSUANCE</th>
<th>2.6%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020 GDP</td>
<td>3.6%</td>
</tr>
</tbody>
</table>

Potential annual issuance in SEA if global GDP contribution levels reached $16B

Notes: 1. Green includes both green and sustainability debt, where sustainability debt refers to projects with combination of green and social impact; 2. Compounded annual growth rates; 3. Bonds include senior unsecured bonds, senior secured bonds, subordinated unsecured bonds, perpetual bonds, sukuk and medium-term notes. Loans include term loans and bridging loans. Others include private placements and project finance; 4. SG-Singapore; TH-Thailand; ID-Indonesia; PH-Philippines; MY-Malaysia; Others include Vietnam, Myanmar, Laos, Brunei, and Cambodia; 5. Others include waste, land use, industry, information and communications technology and unallocated.

Sources: Climate bonds (SEA and Global Reports)
**Strong growth in green IPOs since 2016**

Dip in 2018 due to macro factors, e.g., US-China trade tensions

Thailand pulls ahead in green IPOs, with renewable energy, infrastructure, and buildings as leading sector themes

**Capital raised for IPOs** of green companies in SEA (US$ billion)

<table>
<thead>
<tr>
<th>Year</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td># Sustainable IPOs</td>
<td>8</td>
<td>14</td>
<td>6</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Cumulative IPO value (since 2016)</td>
<td>0.3</td>
<td>2.4</td>
<td>2.5</td>
<td>4.3</td>
<td>5.6</td>
</tr>
</tbody>
</table>

**CAGR:** 45% (since 2016)

20% of total 2020 IPO value

**Cumulatively from 2016-2020,** $5.7 billion raised across:

- **Energy**
- **Buildings/Infrastructure**
- **Materials**
- **Others**

Notes:
1. IPOs in this analysis excludes special-purpose acquisition companies (SPACs) with insufficient information on target criteria; 2. Only includes countries with available data (Indonesia, Malaysia, Singapore, Thailand, the Philippines, and Vietnam); 3. Sources: Dealogic.
Green private equity fundraising has been on the rise since 2017, standing at $0.5 billion in 2020. Dip in 2020 potentially due to Covid-19 pandemic; funds raised lean toward VC stage (~57% total). Singapore is the base of choice for most green funds, driving 2 of the largest fund closes since 2017 (no green funds raised in 2016).

**Green private capital raised in SEA (US$ billion)**

**CAGR: 53% (since 2017)**

- **Cumulative funds raised**
  - 2017: 0.2
  - 2018: 1.1
  - 2019: 2.5
  - 2020: 3.0

- **% of total value of funds raised in 2020**: 9%

**Cumulatively from 2017-2020, $3.0 billion raised across:**

**FUND TYPE**
- VC
- PE

**COUNTRY**
- SG
- MY
- PH

<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th># Green funds</th>
<th>Largest closes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>0.2</td>
<td>1</td>
<td>Capsquare Asia Partners Fund II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$0.2 billion</td>
</tr>
<tr>
<td>2018</td>
<td>1.1</td>
<td>6</td>
<td>Makara Innovation fund</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$0.7 billion</td>
</tr>
<tr>
<td>2019</td>
<td>2.5</td>
<td>6</td>
<td>Petronas Corporate VC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$0.4 billion</td>
</tr>
<tr>
<td>2020</td>
<td>3.0</td>
<td>2</td>
<td>8F Aquaculture fund I</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$0.4 billion</td>
</tr>
</tbody>
</table>

**Notes:**
1. Funds in this analysis include PE/VC funds domiciled in SEA which have thematic focus on green economy sectors.
2. Only includes countries with available data (Indonesia, Malaysia, Singapore, Thailand, the Philippines, and Vietnam).

**Sources:** Pitchbook, Bain analysis.
~$7 billion in green funds raised across broader Asia-Pacific in 2020 – many with SEA mandate

Share of green fundraising of overall value is similar to SEA; most funds within PE stage and raised in Japan or China

Green private capital\(^1\) raised in Asia-Pacific, excluding SEA (US$ billion)

<table>
<thead>
<tr>
<th>CAGR: 22% (since 2016)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3% 9%</td>
</tr>
<tr>
<td>2016 2020</td>
</tr>
</tbody>
</table>

In 2020, $7.2 billion raised across:

<table>
<thead>
<tr>
<th>FUND TYPE</th>
<th>PE</th>
<th>VC</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>COUNTRY 2</td>
<td>JP</td>
<td>CN</td>
<td>AU</td>
</tr>
</tbody>
</table>

Notes: 1. Funds included in this analysis include PE/VC funds domiciled in Asia-Pacific which have thematic focus on green economy sectors; 2. JP-Japan; CN-China; AU-Australia

Sources: Pitchbook; Vision Fund; Agri Investor; Mandala Capital

Investment examples

- **2016**
  - # Green funds: 18
  - **MANDALA CAPITAL**: Focused on sustainable investments across the agri-food value chain
  - **$0.1B** raised in 2016

- **2020**
  - # Green funds: 14
  - **Vision Fund II**: Tech fund covering smart mobility and clean energy
  - **$5B** raised in 2020 (total fund size ~$30B)

- **$100M**
  - **Arcadia**: Biotech firm developing crops and agricultural products that benefit the environment, growers, and consumers
  - Tech firm enabling renewable energy to be stored and delivered for less than the cost of fossil fuels at any hour of the day
Increasing sustainability focus of SEA mutual funds and exchange-traded funds (ETFs), but still a small fraction of global activity

Malaysia leads the region. Globally, Europe dominates, accounting for >80% of assets value

Total AUM of SEA domiciled sustainable1 open-ended mutual funds and ETFs (in US$ billions)

<table>
<thead>
<tr>
<th>Country</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaysia</td>
<td>0.3</td>
<td>0.5</td>
<td>0.6</td>
</tr>
<tr>
<td>Indonesia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singapore</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thailand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAGR: 40% (since 2018)</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Select fund launches:

- **Global Sustainable Equity-I Fund** to invest in sustainable, Shariah-compliant equities
  - NAV3 (as of Jan 21): $90 million
- **United Equity Sustainable Global Fund** to invest in top sustainability performers
  - NAV (as of Jan 21): $8 million
- **Public e-Carbon efficient fund** to invest in companies with efficient carbon footprints
  - NAV (at launch): $80 million

Notes: 1. Universe of sustainable funds encompasses open-end funds and ETFs that have a sustainability objective and/or use binding ESG criteria for investment selection. Money market funds, feeder funds, and funds of funds are excluded; 2. Data only included from Q2 2018 onwards (Q1 2018 unavailable). AUM taken at end of each year. 2019 data used for Europe sustainable fund AUM as % of overall AUM; 3. Net asset value

2020 global AUM of sustainable funds

<table>
<thead>
<tr>
<th>Region</th>
<th>AUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td></td>
</tr>
<tr>
<td>SEA &lt;0.1%</td>
<td></td>
</tr>
<tr>
<td>Rest of Asia-Pacific</td>
<td></td>
</tr>
</tbody>
</table>

Sources: Asia Assets Domicile
Increasing share of green corporate investments, hitting $4.9 billion and 11% of overall value in 2020

Green investments have grown in value despite the overall market contracting between 2016 and 2020. Renewable energy, particularly solar, is the standout sector, with most activity taking place in Thailand.

Note: 1. Only includes countries with available data (Indonesia, Malaysia, Singapore, Thailand, the Philippines, and Vietnam) and excludes investments <$15 million; 2. Others include food, waste and water, industrial, transport, and building and infrastructure.

Sources: Capital IQ, ThinkGeoEnergy

Green corporate transactions\(^1\) across SEA in 2016 and 2020 (US$ billion)

- **CAGR:** 22% (since 2016)
- **2016:** $2.3 billion
- **2020:** $4.9 billion
- 11% of total fundraising

In 2020, $4.9 billion deployed across:

**TARGET COUNTRY**
- TH
- SG
- PH
- VN
- TW
- Others

**INVESTOR REGION**
- CN
- TH
- SG

**SECTOR\(^2\)**
- Solar
- Renewable (mixed)
- Food
- Other
- Other energy

**Largest deals**

**2016**

- **$755 million**
- **Description:** PT Barito Pacific Tbk (ID) acquired 67% stake in the geothermal power company with a total power generation capacity of 875 MW

**2020**

- **$2.8 billion**
- **Description:** Wenzhou Yihua Connector Co (CN) participated in an equity funding round for the Thai manufacturer of solar energy components and photovoltaic modules

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Notes:
- 1. Only includes countries with available data (Indonesia, Malaysia, Singapore, Thailand, the Philippines, and Vietnam) and excludes investments <$15 million.
- 2. Others include food, waste and water, industrial, transport, and building and infrastructure.

Sources: Capital IQ, ThinkGeoEnergy
After slow start, share of green deals in PE/VC rose sharply in 2020 to $1.9 billion, representing 19% of total deal value.

Singapore and Philippines lead in deal value; energy takes spotlight, followed by waste and water.

Notes: 1. Excludes deals <10 million. Green PE/VC deals involve companies/firms that improve or protect the environment; 2. Only includes countries with available data (Indonesia, Malaysia, Singapore, Thailand, the Philippines, and Vietnam); 3. Others include electronics, transport, water, information technology, services, agriculture and aquaculture, computer-related.

Sources: AVCJ, Bain analysis

### PE and VC green¹ capital deployed in SEA (US$ billion)

**CAGR:**
50% (since 2016)

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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Deal value</td>
<td>0.1</td>
<td>0.2</td>
<td>0.1</td>
<td>0.1</td>
<td>0.2</td>
<td>0.4</td>
<td>0.2</td>
<td>0.3</td>
<td>1.9</td>
<td>2.0</td>
</tr>
<tr>
<td># Deals p.a.</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>7</td>
<td>8</td>
<td>12</td>
</tr>
</tbody>
</table>

**Largest deals:**

- **2016**
  - **GREEN**
  - Citic Envirotech
  - **$285 million**
  - Membrane-based solutions provider for wastewater treatment and recycling

- **2017**
  - Energy Development Corp
  - **$1.3 billion**
  - Leading geothermal energy producer, with diversified renewable portfolio

- **2018**
  - Astroscale
  - **$100 million**
  - Waste and debris management of orbital satellites

- **2019**
  - Sun Electric
  - **$100 million**
  - Solar energy company with 13 MWp of solar installations to date

- **2020**
  - Equis Development
  - **$1.3 billion**
  - Infrastructure developer targeting bioenergy, renewables, and waste management

### Cumulatively from 2011-2020, $5.0 billion deployed:

**DEAL TYPE**
- PE
- VC

**TARGET COUNTRY²**
- SG
- PH
- TH
- Other

**INVESTOR REGION**
- APAC
- International
- SEA

**SECTOR³**
- Energy
- Waste & water
- Materials
- Food
Mixed renewables, geothermal, solar, waste, and materials are key subsectors

Most deals occurred in the expansion/growth stage

Cumulative green PE and VC deal value by primary and secondary industry, 2011–2020 (US$ billion)

Notes: 1. Late-stage includes buyout, mezzanine, private investment in public equity (PIPE) deals, and pre-IPO financing. 2. Others include IT, utilities, computer-related, electronics, manufacturing, consumer products, transportation and distribution, nonfinancial services, telecommunications, and retail

Sources: AVCJ

48 green deals between 2011 and 2020 across stages (# deals):

<table>
<thead>
<tr>
<th>Energy</th>
<th>Start-up/early stage</th>
<th>Expansion/growth</th>
<th>Late-stage¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>6</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Waste</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Plastics</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Food and Agri</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Others²</td>
<td>5</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

Total: $5.0 billion, 48 deals
Share of sustainable infrastructure investments rising despite dip in overall investments

Clean energy is the leading sector

Capital deployed to sustainable infrastructure assets\(^1\) in SEA (US$ billion)

<table>
<thead>
<tr>
<th>Year</th>
<th>Capital Deployed (US$ billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>4.2</td>
</tr>
<tr>
<td>2020</td>
<td>1.9</td>
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</tbody>
</table>

CAGR: -18% (since 2016)

36% of total infrastructure deal value

In 2020, $1.9 billion deployed across:

- **TARGET COUNTRY**: SG, VN, ID, TH, PH
- **INVESTOR REGION**: SEA, Asia-Pacific, EU/AM, int.
- **SECTOR**: Energy (Solar), Power utilities, Geo thermal, Other energy, Waste & water, Rail

Largest deals

- **2016**: Bangkok Mass Transit System Project (Red Line)
  - **Investment**: $900 million
  - **Description**: Construction of large-capacity railroad in the Bangkok Metropolitan Region, estimated to greatly alleviate traffic congestion and shift road transport to urban rail, reducing CO\(_2\) emissions by ~48 kt per year

- **2020**: Java geothermal energy project
  - **Investment**: $300 million
  - **Description**: Investment by state-owned company PT Geo Dipa Energi (GDE) to expand its geothermal energy portfolio by 110 MW. The project aims to reduce CO\(_2\) emissions by more than 700 kt per year

Notes: 1. Only completed deals included in analysis

Sources: Preqin, Global Infrastructure, Bain analysis
Key sectoral themes attracting capital today

Energy solutions, green buildings and construction, waste and water, and sustainable materials are currently center stage.

**Sectors attracting capital**

**Energy solutions**
Low-carbon energy (e.g., solar, hydropower, geothermal, wind), energy efficiency and grid solutions

- Debt: 31% | IPOs: 45% | Corp.: 89%
- PE/VC: 72% | Infra: 78%

**Green buildings and construction**
Smart buildings that optimize energy consumption, use sustainable materials, and embrace on-site renewable energy

- Debt: 49% | IPOs: 27%

**Waste and water management**
Waste and water management and treatment and innovative solutions to reduce waste

- Debt: 9% | IPOs: 2% PE/VC: 18% | Infra: 14%

**Sustainable materials**
Recyclable plastic alternatives, sustainably designed packaging, and low-carbon building materials

- IPOs: 23% | Corp: 2% | PE/VC: 3%

**Drivers**

**SEA energy transition agenda**
- ~33% renewable energy capacity target by 2025, vs. ~24% today
- Regional unconditional target to reduce emissions by 26% by 2030

**Green buildings and construction**
- Estimated ~$400 billion investments needed for sustainable buildings between 2021 and 2030

**Waste and water management**
- >90 WTE plants to be operational by 2022 in the region, with combined capacity of ~800 MW

**Opportunity thesis**

**Sustainable food systems**
Alternative proteins, aquaculture, controlled environment agriculture, and sustainable production

- Corp.: 7% | PE/VC: 3%

**Conservation and restoration of nature**
Nature-based solutions to conserve and restore ecosystems

- Limited private investments today but poised for change

**NASCENT BUT PROMISING**

**Share of sector of total green:**

Notes: 1. 2020 figures shown apart from IPOs (2016-2020 cumulative) and PE/VC (2011-2020 cumulative)

Sources: ADB; e-Conomy SEA; The Straits Times; Science Magazine; The ASEAN Post
While a promising start, a lot more is needed

There is plenty of **headroom to grow**

Globally, SEA contributes to
- **3.6%** of GDP
- **7.2%** of emissions

But only
- **2.6%** of green debt issuance
- **<0.1%** of sustainable¹ public fund AUM

The **scale of investment** required² to deliver SEA’s green transition is massive

~**$2 trillion** sustainable infrastructure investment required between 2021 and 2030, which can be seen as an **obstacle or an opportunity**

Clean energy

- **Renewable power generation** (solar, hydropower, wind, etc.)
- **Grids** (storage, delivery, and system flexibility)
- **Buildings** (on-site renewables and energy efficiency)
- **Transport** (EV,² EV infra, and fuel efficiency)
- **Industry (Renewables & efficiency)**
- **Biofuels**
- **Water**
- **Rail** (metro & high-speed rail)
- **Waste**

~**$50 billion** investments in nonrenewable energy

Everyone is needed

**40%** of infrastructure investments will need to come from the private sector, according to ADB⁴ forecasts

Notes: 1. Includes funds raising capital for environmental and social sustainability objectives;
2. Energy investments needed based on the Transforming Energy Scenario (compatible with well below 2°C, and toward 1.5°C Paris agreement targets) from the International Renewable Energy Agency (IRENA). Water estimated based on G20 Infrastructure Outlook (inclusive of investment needed to meet Sustainable Development Goals [SDGs]), includes wastewater, water collection, treatment and processing, transmission and distribution assets including desalination, excludes land purchases. Rail investments include Metro and high-speed rail investment needs only. Waste investments estimated for total waste management sector, inclusive of WTE, landfills, composters, recycling and other waste infrastructure;

Sources: Bain analysis; Global Infrastructure; IRENA; World Bank, IFC, ADB, DBS
UNLOCKING CAPITAL

DFIs, international governments, and NGOs are also stepping up climate financing in SEA

Energy transition and conservation are key focus

Significant DFI¹ capital deployed in 2020

~ $6 billion

To finance climate change and rural infrastructure projects (~1.5x increase from 2019)

~ $1 billion

To mitigate and adapt to climate change across energy, transport, agriculture, water, financing, and other sectors

International governments stepping up support

~ $10 billion

Asian Energy Transition Initiative

To aid SEA’s transition to cleaner energy (investment and loan facility established by Japan in 2021)

~ $1 billion pledged

Indonesia-Norway Partnership

Results-based funding scheme based on conservation outcomes, e.g., avoided deforestation (first $56 million paid out to Indonesia in 2019)

Global conservation NGOs² are investing in the region, with capital flow since 2017

>$100 million

across various projects

Numerous smaller-scale commitments for biodiversity conservation and circular economy projects

Notes: 1. Development Finance Institutes; 2. Nongovernmental organizations
Sources: AIIB; ADB; World Bank; Conservation; The Jakarta Post; WWF; CI; TNC; IEEFA

Non-exhaustive
Catalytic financial mechanisms are further mobilizing private capital

Increasing role of creative financial strategies and instruments (e.g., blended financing, take-out facilities (TOFs), outcomes-based funding)

**Blended financing**

- **$4 billion**

  - ACGF
  - Launched 2019
  - Aims to attract $3 of commercial capital per dollar of public capital for green infrastructure projects

- **$3 billion**

  - De-risk SDG-related infrastructure projects to mobilize private funds
  - Launched 2018

**TOFs**

- **$2 billion**

  - Clifford Capital
  - ADB
  - Launched 2018
  - Established Bayfront Infrastructure Capital, Asia’s 1st TOF, to mobilize private capital into infrastructure development

**Outcomes-based funding**

- **$1 billion**

  - RIMBA Collective
  - Nature Positive Supply Chains
  - Launched 2021
  - Private sector-led initiative to incentivize forest conservation through results-based funding

**Notes:**

1. ASEAN Infrastructure Fund
2. Sources: ADB, AIIB, ACGF, InfraCo, BBC
3. EDSA Greenways: Infrastructure development in the Philippines (2020)
4. AIF and ADB provided ~$140 million in financing, catalyzing ~$90 million in private sector investment
5. INFRACASIA
7. InfraCo provided ~$20 million in equity and loans, mobilizing ~$150 million in commercial capital
Several barriers impede green capital flows today

### Macro challenges

- **Inconsistent government policies**
  - (Clean energy) investments are heavily infrastructure-related, and lack of predictable policies and government support make investors hesitate to put capital in. **Director, Energy Investments SEA Government Investor Co**

- **Immature ecosystem**
  - The cost of environmental compliance in SEA today is too prohibitive. **Senior MD SEA, Global PE fund**

- **Low quality and high risk**
  - There is a surplus of interested capital chasing scarce quality assets in the region. **Sustainability Director SEA Government Investor Co**

### Immature ecosystem

- **High transaction and compliance costs**
  - Senior MD SEA, Global PE fund

### Low quality and high risk

- **Limited quality assets and project developers**
  - Sustainability Director SEA Government Investor Co

### Organizational hurdles

- **Lack of sponsorship from leadership and organization inertia**
  - Organizational change will not happen without alignment and focus from senior management. **Senior MD SEA, Global PE fund**

- **Complex and evolving standards and expectations**
  - Executive Director SG, Global Business Coalition

- **Long lead times and volatility associated with returns**
  - Investments in sustainable assets often have longer horizons and uncertain returns, which is inconsistent with the largely impatient capital in the private sector. **Director of AI, Global Development Org**

- **Unclear capital allocation principles with misaligned incentives**
  - We need a GAAP-style global standard to account for and price climate outcomes... only then will you see actual action. **Senior MD SEA, Global PE fund**

### Notes:

1. Generally Accepted Accounting Principles

### Sources:

- Industry interviews
Critical enablers required to unlock full potential

**Strong government support and consistent policies**
- Consistent government signals and policies to strengthen investor confidence and attract more capital into the green economy (e.g., corporate tax benefits and land use incentives, etc. for solar energy in Vietnam)
- Financing and incentives aligned with achieving national green goals, and initiatives to support the transition of impacted sectors

**Blended financing**
- Use of creative financial instruments through public-private partnerships such as blended financing and take-out facilities (TOFs) to align different stakeholder objectives and incentives, de-risk investments and attract more private capital
- Mobilization of private sector green infrastructure financing to reduce burden on pandemic-strained government budgets (e.g., ADB’s ASEAN Catalytic Green Finance Facility [ACGF] supports SEA governments to finance sustainable infrastructure)

**Digital platforms and data-enabled solutions**
- Digital infrastructure and automated, data-enabled processes to minimize friction, optimize processes, and scale sustainability measurement and reporting while reducing transaction costs and efforts (e.g., SGX and Temasek partnership to develop a blockchain-based digital asset infrastructure)

**Ecosystem fundamentals and infrastructure**
- Ecosystem-wide guidelines to define sustainability impact and materiality (e.g., ASEAN Taxonomy)
- Short-term debt instruments to mobilize working capital and trade facilities for green projects
- Buildout and scaling of liquid, regional sustainable asset markets (e.g., regional carbon markets)

**Fit-for-purpose fund allocation and operating principles**
- Recognized metrics to assign value to social and environmental factors, in addition to financial return, to enable systematic allocation of funds to achieve highest impact
- Established operating principles to mitigate misaligned incentives that underpin impatient capital
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