BCG

ACETTNA Summary Findings

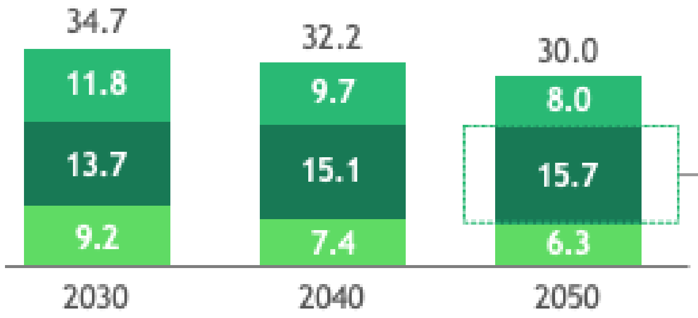
India and Southeast Asia focus

October 26th 2023

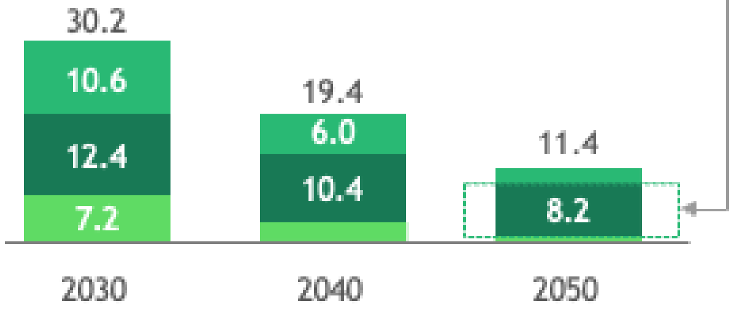
Atlantic Council

Accelerating emerging market decarbonization is key to reducing energy-related emissions

"Business as usual" forecast
(Gt CO_2[1] , IEA Stated Policies Scenario)



Announced pledges forecast
(Gt CO_2, IEA Announced Pledges Scenario)



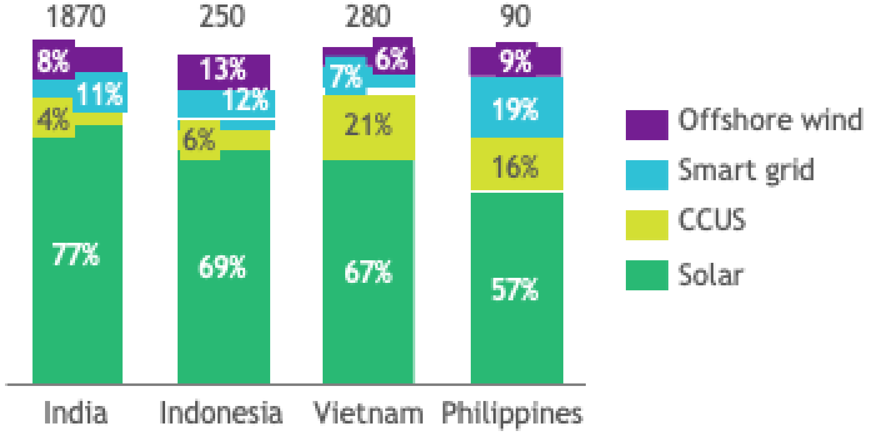
Meeting emerging market climate targets can reduce energy-related emissions ~7.5Gt, ~25% of 2020 global energy-related emissions

Advanced economies | Emerging market and developing economies | China

3 out of 4 countries have announced net zero pledges

Country	Net-zero climate pledges
Philippines	✗ No net-zero pledge
Vietnam	✓ Net-zero by 2050
Indonesia	✓ Net-zero by 2060
India	✓ Net-zero by 2070

Solar to provide 60-80% of emissions abatement[2]



1. Includes emissions from industrial processes, fossil fuel combustion, and flaring
2. Total CO_2 abatement ($MtCO_2e$/yr) for each market and relative abatement by technology in 2040
Source: IEA World Energy Outlook 2022

Similar challenges across multiple emerging markets which inhibit ability to deploy required levels of clean technologies

Lack of supporting policies & regulations

- Lack of clear regulations reduce investment certainty (e.g., CO_2 liability, offshore leases)
- Local content requirements limit supply and increase costs
- State monopolies limit participation of private clean energy developers

Lack of supporting infrastructure

- Limited energy access reduces prioritization of decarbonization
- Insufficient power grid infrastructure limits interconnections
- Lack of pipeline networks or depleted oil wells limits potential for CO_2 transport/storage

Lack of access to low-cost capital

- ~$750B gap to financing needs limits project development
- Lack of quality project pipelines limits financing deployment
- High cost of financing increases project cost, hurting economics

Green premium for clean technologies

- Limited incentives / penalties do not account for carbon externalities
- Continued subsidies for fossil fuels and legacy state-owned players reduces clean tech competitiveness

Source: BCG analysis

Combining technical expertise with low-cost financing to create an attractive "full-service package" for emerging economies is a potential for U.S. export

Technical expertise
Leverage U.S. leading expertise in technologies such as CCUS and smart grids to secure local partnerships

+

Blended finance
Use blended finance to attract private capital and offer compelling financing options for development projects

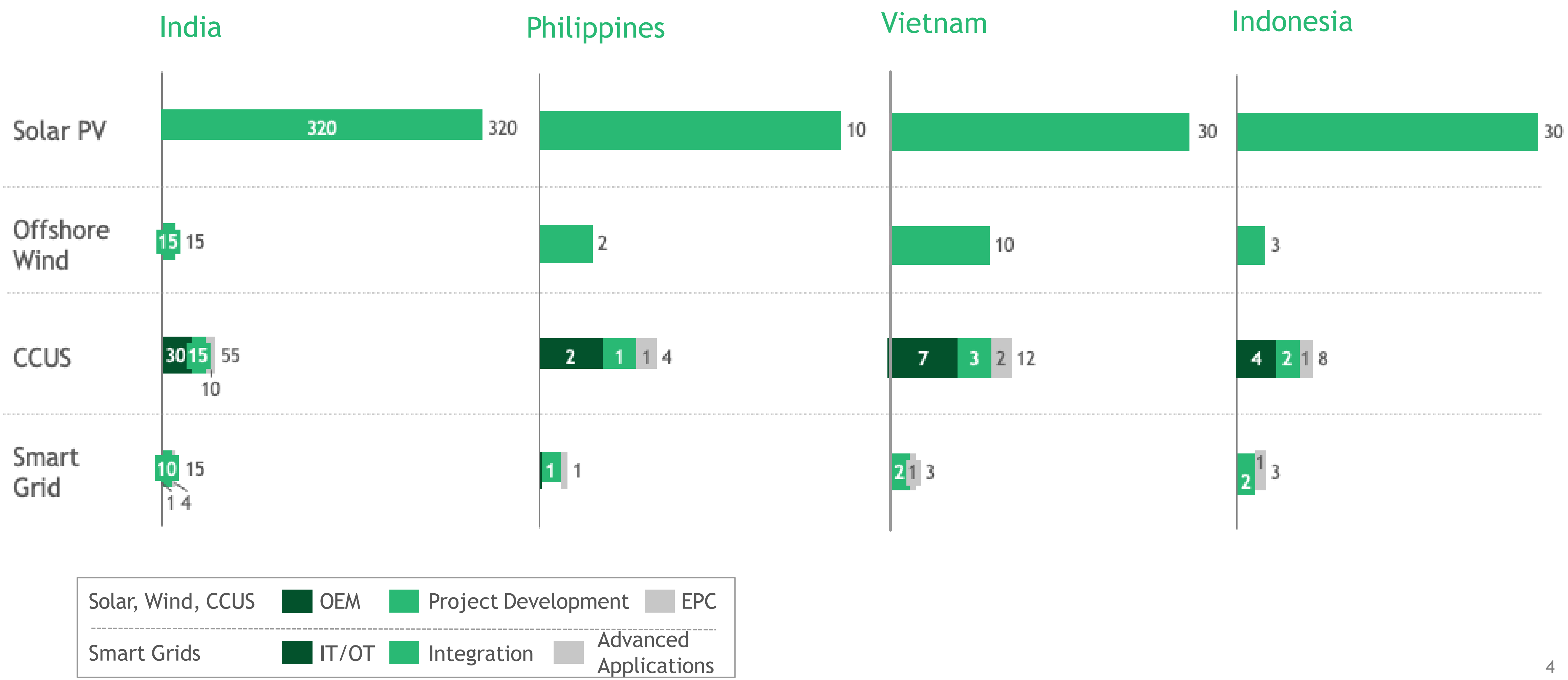
+

Local Partnerships
Partner with local players to leverage knowledge of local markets, regulations, and vendors

Full-service package

India dominates the export market potential, opportunities in SEA fragmented

Export Market Potential by Technology (2022 - 2040, $B)



India | India presents a sizable market opportunity, but domestic competitiveness and business complexity complicate exports

Clear clean energy targets

Opportunities

- To meet ambitious goals to deploy 500 GW of RE by 2030 and reach net zero by 2070, India must install ~45 GW of renewables yearly, creating a substantial opportunity
- Policy measures, such as reverse auctions, RECs, RPOs, tax exemptions, and subsidies, create competitive and attractive RE market[1]

Challenges

- Inaccurate reporting / data creates discrepancies between what has been accomplished on paper and what is reality

Competitiveness of domestic players

Opportunities

- India builds assets at scale faster than other markets, providing U.S. OEMs (e.g., GE, First Solar) opportunity to quickly deploy mfg. plants

Challenges

- Due to low labor and energy costs, domestic manufacturing is cheaper than imports (e.g., smart meter hardware is 2-3x cheaper than in the U.S.)
- Domestic manufacturing incentives (e.g., PLI[2] schemes) and basic customs duties further disadvantage foreign manufacturers, particularly in solar PV

Complex business environment

Opportunities

- India has lower policy restrictions on foreign entrants within development and financing, with no local presence requirements

Challenges

- Since each state acts as its own regulatory and investment entity with varying languages, customs, and regulations, local players are better-positioned to navigate the complex environment
- Land acquisition requires local negotiations and presence due to fragmented holdings and poor land records

Capital needs and infrastructure

Opportunities

- India is among the most attractive emerging markets for foreign investors, with opportunity for the U.S. to support India's investment needs (~$223B in investment needed to meet 2030 targets)

Challenges

- Low financial health of DISCOMs[3] and low utility tariffs on RE have led to PPA renegotiation requests and payment delays, exposing renewable energy assets to high risk

1. REC = renewable energy certificate, RPO = renewable purchase option, 2. PLI = production linked incentive, 3. DISCOMs = distribution companies (electricity)
Source: BCG Analysis, Financing India's 2030 Renewables Ambition

Southeast Asia[1] | Despite clean-energy potential, insufficient capital, trading barriers, and monopolies create challenges for U.S. exports

Large potential but limited focus and ambition

Opportunities
- Large solar and wind potential across the region creates opportunity for multinational cooperation to seize potential that countries can't capture alone

Challenges
- Loose climate targets hinder prioritization of clean tech
- Oil, gas, and coal impose powerful influence slowing down other energy sources
- Energy security and geopolitical concerns cause reemphasis on coal

Cost sensitivity and insufficient infrastructure

Opportunities
- Capital needs may open doors for U.S. project financing, including through multilateral agencies

Challenges
- Limited grid capacity has stymied renewable growth as some grids cannot easily support additional input from renewables
- Financing remains a limitation due to unattractive government incentives

Relationship with Asia and other trading barriers

Opportunities
- Among non-Asian countries, the U.S. leads commerce relationship with the region

Challenges
- Strong Chinese presence
- High tariffs and preferential treatment to regional partners (e.g., Japan and Korea) complicates U.S. imports
- Lack of policies to incentivize green energy and/or penalize fossil-fuel
- Local content, low cost labor and manufacturing expertise

Strong presence of state-owned monopolies

Opportunities
- Virtual monopolies on energy allow the U.S. to make focused bets to win the markets

Challenges
- Concentrated markets create dependency on partnerships with dominant players
- Power asymmetry may hinder U.S. potential
- Population needs put pressure on Governments to prioritize development

Note: 1. Indonesia, Philippines, Vietnam

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