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MAPPING THE GAP: *The Road from Paris*

Finance Paths for a 2-Degree
Future



Ceres

Ethan Zindler and
Ken Locklin

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NEW ENERGY FINANCE

- ***Clean energy investment is poised for rapid growth. Even under a business-as-usual scenario, investment in new renewable electric power generation over the next 25 years is projected to reach \$6.9 trillion.***
- ***A world working to achieve the goals of the Paris Climate Agreement – to limit temperature change to 2°C or below – will see investment in new renewable power generation increase 75% above business-as-usual.***
- ***Total clean electric power generation infrastructure capex over the next 25 years under a “2°C scenario” presents a \$12.1 trillion investment opportunity in total.***
- ***While the scale of this new investment opportunity is massive, it is dwarfed by the the capacity of global financial markets to unleash the needed investment capital, creating extensive new opportunities for commercial financiers, institutional investors and others.***
- ***Expanding clean energy investment opportunities are available now, under existing policy frameworks and market conditions, yet investors are not likely to mobilize sufficient funds to fully close the divide between what will happen under a business-as-usual scenario and what should happen (temperature increase <2°C) unilaterally. Policy makers need to “mind the gap” to ensure that investment grows at the speed and scale required. This highlights the critical role of the “ratcheting” mechanism in the Paris Climate Agreement, among other tools.***



EXECUTIVE SUMMARY

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Bloomberg New Energy Finance, Ceres and Ken Locklin have collaborated to examine more closely total volumes of capital that will be required to fund clean energy power project development in the electric sector over the next 2.5 decades.

The project's goals:

- To examine total volumes of capital required in electricity generation under both a “business-as-usual” (BAU) scenario and under a “two-degree C” scenario (2°C) in which sufficient steps are taken to increase clean energy build to ensure global temperatures rise no more than 2°C. Thus the project name *Mapping the Gap*, as it aims to better understand the funding “gap” between BAU and 2°C scenarios.
- To estimate clean electric power infrastructure investment flows via various investment subsectors, such as traditional project finance, asset-backed securities, green bonds, and others.

Key findings regarding total capital required under New Energy Outlook (“NEO”) 2°C:

- BNEF anticipates a sharp ramp up in overall investment into lower-carbon technologies over the next decade, assuming the world seeks to “lock in” CO₂ reduction benefits earlier that will pay dividends in critically needed carbon pollution reductions over the longer term.
- The 2°C scenario represents a \$12.1 trillion investment opportunity for new renewable electric power* generation over 25 years, or \$485bn/yr on average, BNEF estimates. Under BNEF’s BAU view, that opportunity is \$6.9 trillion, or \$277bn/yr. Thus the “gap” is \$5.2 trillion or \$208bn/yr.
- While these sums may appear daunting, they are dwarfed by global financial markets. In the US alone, consumers borrowed \$542bn over the past year to purchase cars, and assumed \$1.4 trillion in new mortgage debt. Clearly, the financial markets have the capacity to absorb the financing “gap” between BAU and 2°C.

*Wind, solar, geothermal, and other of the most modern clean technologies – not large hydro or nuclear.

- Key findings regarding total capital required under NEO 2°C (cont'd):
 - A majority of anticipated investment in new renewable power generation is likely to go toward emerging markets. Under BNEF's BAU, non-OECD countries are expected to attract \$4.3 trillion for new renewables generation through 2040. The BNEF 2°C forecast is focused on aggregate global investment without drawing national or regional distinctions. Were the same regional investment ratio applied to the 2°C forecast as is used for BAU, non-OECD nations would see \$7.9 trillion in new renewable generation investment.*
- Key findings regarding future finance pathways:
 - To date, the majority of clean energy power generation has been financed through direct loans. But other industries raise similar volumes in more diverse ways, often at lower cost. As clean energy continues to scale, the industry will expand the variety of equity and debt sources it taps.
 - On the equity side, falling costs could make system "hosts" (in the case of distributed solar) and corporates such as utilities (in the case of big projects) more inclined to retain direct equity. As the low-risk / reliable-return opportunity becomes more apparent, investment via public-market vehicles exemplified by US "yieldcos", master limited partnerships (MLPs), and real estates investment trusts (REITs) could spread. As clean energy becomes a *de facto* infrastructure play, it should find a far more expansive home in large institutional infrastructure investors' portfolios.
 - On the debt side, typical project finance loans have been vital for clean energy to date, but their share of overall debt could decline to 33% by 2040. Institutional infrastructure investors could provide up to 15% of overall debt financing as pension funds and others take a greater interest. On-balance sheet financing is also poised to rise substantially as utilities develop more projects. Finally, the opportunity to refinance portfolios through asset-backed securities could rise.
 - Against this general picture of substantial resource availability to fund the 2°C scenario, navigating the transition already underway from predominantly OECD-led growth to non-OECD driven market expansion will create new needs and opportunities for investment support and risk mitigation. Multilateral development banks and other public funding resources will have an expanding role to play in arbitraging risks and facilitating capital flows.

*Not a BNEF forecast but an overlay of BAU assumptions onto the NEO forecast



METHODOLOGY

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- The New Energy Outlook (NEO) is BNEF's official long-term forecast of how the global power sector will evolve over the next 25 years. NEO projects energy asset deployment using a number of dynamic models driven by BNEF's proprietary understanding of current and future costs of power generation technologies and system characteristics.
- Released in June 2015, one of the report's key outputs is the total dollar investment requirements, split by technology (wind, solar, etc.).
- NEO took a novel approach to projecting energy demand that incorporates BNEF's projections on energy efficiency. Unlike some other forecasts, which assume a static relationship between electricity consumption and economic growth, NEO recognized that this relationship is actually dynamic and changes over time. As countries' power sectors become more mature their demand profiles flatten or even turn negative, in part due to extensive energy efficiency gains.
- NEO also sought to take into account the need for expansion of so-called flexible capacity such as power storage to accommodate high penetration of new clean energy power generation.
- What NEO did not originally do:
 - Consider how much *additional* investment would be needed in new renewable power generation to limit global temperature rise to no more than 2 degrees Celsius
 - Analyze projected investment by *asset class* to consider specifically how much of each type of capital would be required.

- To consider a 2-degree scenario (2°C), the NEO model was re-run on the assumption that clean energy build would “crowd out” fossil power plant construction as quickly as needed to allow the power sector to contribute its share to reducing emissions growth. The Intergovernmental Panel on Climate Change’s “carbon budget” was used for guidance. Inherent assumptions include:
 - Some new policies would be implemented to more accurately internalize relevant costs, making new fossil fuel generation less economic.
 - These policies would be undertaken globally, meaning increases in renewable energy deployment would be seen worldwide. NEO 2°C made no assumptions about what policy steps individual nations would take or how that would impact their specific adoption rates of clean energy. It is rather a more “top down” view on needed global shifts in clean energy production.
 - The clean energy technologies employed today at scale will be the ones primarily used tomorrow as their costs continue to decline. “Black swan” technology breakthroughs were not forecasted.
- Regarding terminology, this report employs the following two key definitions:
 - “Lower-carbon technologies,” which includes large hydro, nuclear, and renewables (including wind, solar, geothermal, and other zero-emission sources of power)
 - “New renewable energy technologies” which includes only wind, solar, geothermal, and other zero-emission power sources.

METHODOLOGY (CONT'D)

- To consider potential trajectories or "pathways" of asset class growth, BNEF, Ceres, and Ken Locklin of Impax Asset Management LLC (the "Mapping the Gap" or "MTG" team) took into consideration:
 - Historical literature on how other mainstream infrastructure sectors have seen financing evolve.
 - The opinions of 26 finance community experts on the front lines of funding the clean energy evolution. Individuals from the following institutions were consulted: Advance Capital, Al Tassar Energy, Birch Tree Capital, BlackRock, Chadbourne & Parke, Citigroup, Columbia University Center on Sustainable Investment, Emerging Energy & Environment, Climate Bonds Initiative, Energy Infrastructure Advocates, European Investment Bank, GE Capital, Greentech Capital Advisors, Hannon Armstrong, Impax Asset Management, International Finance Corporation, Kilpatrick Townsend, Macquarie, Marathon Capital, Princeton Development, National Renewable Energy Laboratory, US Overseas Private Investment Corporation, Power for All, Rabobank, and Wells Fargo. *[Note, however, that opinions expressed herein are solely those of the MTG team.]*
- The MTG team examined the basic models of funding both large- and small-scale clean energy projects employed to date. This included a range of strategies from those that have historically been widely used (e.g., traditional project finance) to those with thus far only limited application (green bonds for new projects). They reviewed both investment vehicles used for new financings and those used in re-financings.
- The MTG team then plotted plausible market development pathways for each of these strategies. Key questions that drove the discussions with experts:

- *How will overall leverage levels evolve over time? As clean energy becomes more mainstream, will such projects be able to take on higher levels of lower cost debt, increasing cost effectiveness?*
- *How prevalent will the currently standard project finance models prove to be in the future as clean energy scales up?*
- The MTG team then created a list of exemplars of principal asset classes covering these strategies. The roles of these components and their likely relative market penetration were discussed with the finance experts in interviews to solicit qualitative input.
- Based on those expert conversations, the MTG team plotted potential market penetration of each asset class on a percentage basis over time. They then applied these metrics to the BNEF long-term NEO BAU forecast to determine potential \$ demands per asset class under current market assumptions. Specifically, financing for wind and both utility-scale and distributed solar were examined in detail, as these three technologies represent the vast majority of potential future investments in new renewable energy projects.
- The same approach was then taken with the BNEF NEO 2°C scenario which envisions substantial additional clean energy capacity deployment. While the higher deployment volumes envisioned in the 2°C case were projected to further accelerate future LCOE declines, the team concluded that the underlying financing structures employed were not likely to vary materially from those projected in the BAU case.
- Note that all charts, figures and totals are provided in 2015 “real” dollars.

Ceres

Ceres is a nonprofit organization mobilizing business leadership on climate change, water scarcity and other global sustainability challenges. Ceres directs the Investor Network on Climate Risk (INCR), a network of more than 110 institutional investors with collective assets totaling more than \$13 trillion. Ceres also directs BICEP, an advocacy coalition of 38 businesses committed to working with policy makers to pass meaningful energy and climate legislation. For more information, visit www.ceres.org or follow on Twitter: @CeresNews

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Bloomberg New Energy Finance (BNEF) provides unique analysis, tools and data for decision makers driving change in the energy system. With unrivalled depth and breadth, BNEF helps clients stay on top of developments across the energy spectrum with 200 staff in 14 global offices. BNEF's products provide financial, economic and policy analysis, as well as news and the world's most comprehensive database of assets, investments, companies and equipment in the clean energy space. For more information, see about.bnef.com, or contact sales.bnef@bloomberg.net.

Acknowledgements

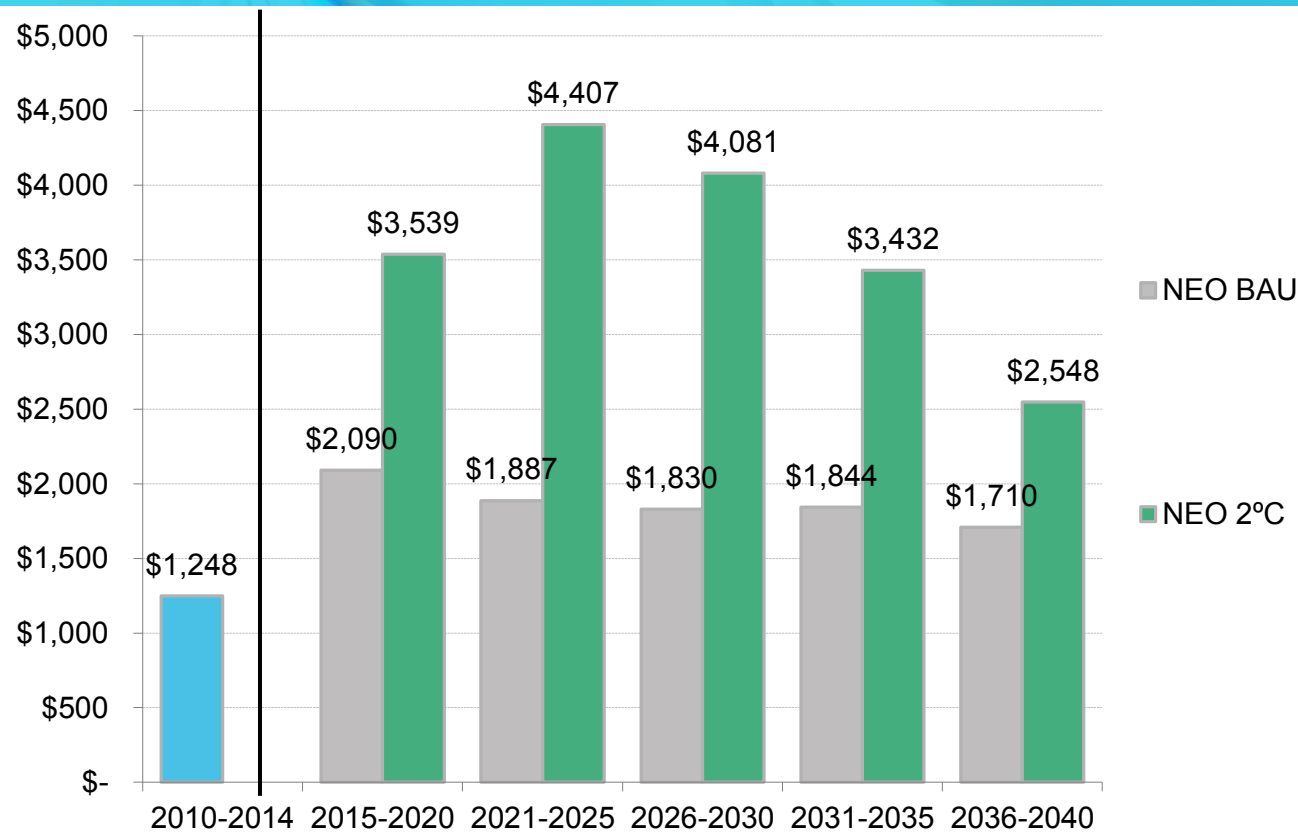
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LOWER-CARBON POWER GENERATION CAPITAL REQUIREMENTS

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BNEF FORECAST OF TOTAL INVESTMENT IN LOWER-CARBON POWER GENERATION (\$BN, REAL)

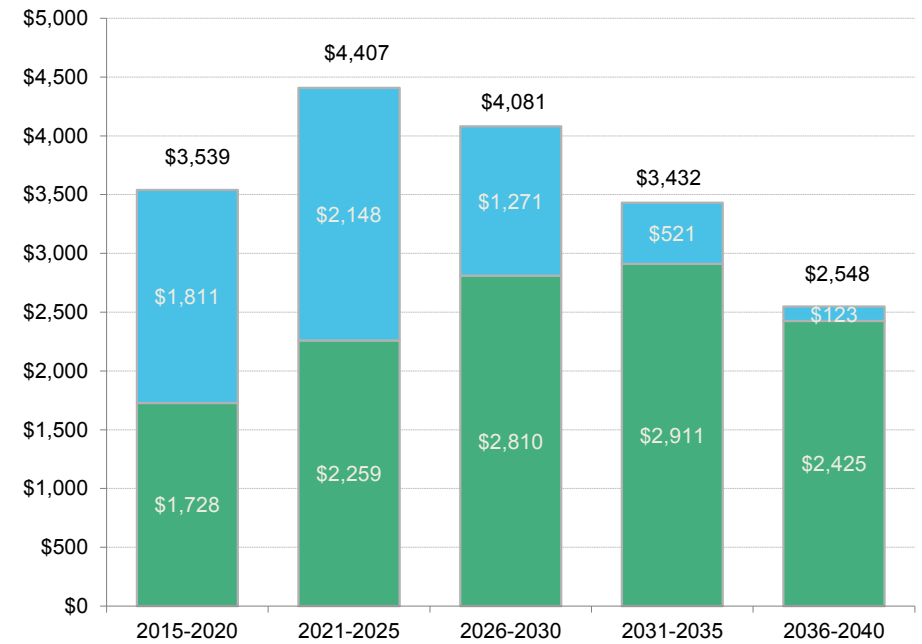
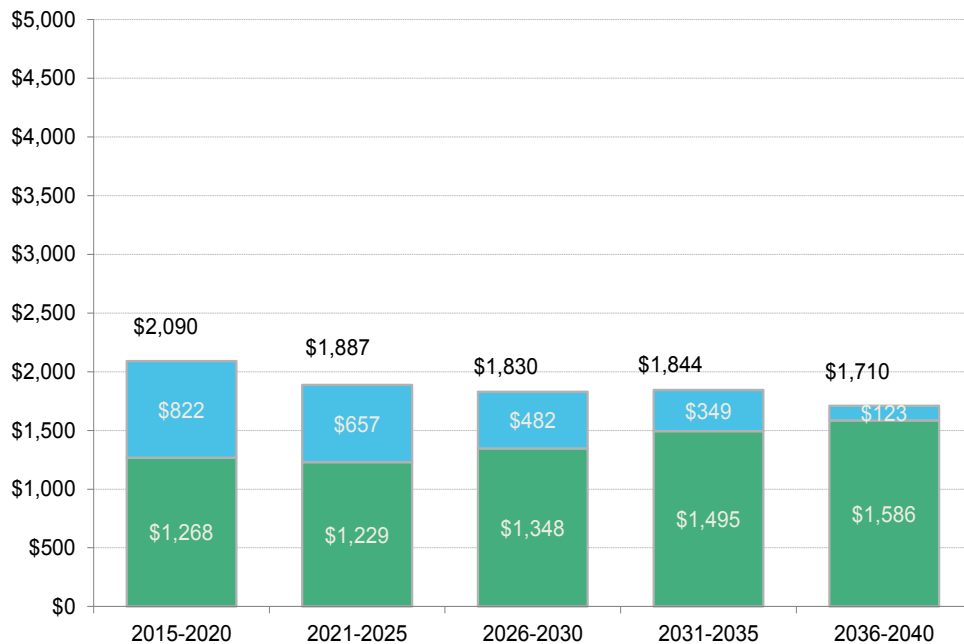


- Under the NEO 2°C scenario, BNEF anticipates a sharp ramp up of investment into lower- and zero-carbon sources will be required over the next decade. These early steps are necessary to cut CO₂ emissions sufficiently to allow for climate stability by 2040. Current climate models suggest that lags and inertia in climate systems require this early action.
- Even under a NEO BAU scenario, BNEF anticipates substantially higher commercially-driven investment in wind and solar than seen in the recent past.

FUTURE GROWTH FOR LOWER-CARBON POWER TECHNOLOGIES (\$BN, REAL)

NEO BAU

NEO 2°C SCENARIO



■ New Renewables ■ Legacy lower-carbon

- The NEO 2°C scenario assumes a sharp ramp up in investment in the most rapidly evolving clean energy technologies – wind, solar PV, and others – with existing lower-carbon technologies large-scale hydro and nuclear playing an important role as well in the near term.
- Ultimately, however, investment in the newest renewable technologies – wind and solar – predominates, as the costs associated with these drop further and they start to truly out-compete legacy lower-carbon sources.

Source: BNEF

Note: “Legacy lower-carbon” includes large hydro and nuclear



NEW RENEWABLE ENERGY CAPITAL REQUIREMENTS

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INVESTMENT IN NEW RENEWABLE POWER GENERATION BY TECHNOLOGY UNDER BNEF 2°C SCENARIO (\$BN, REAL)

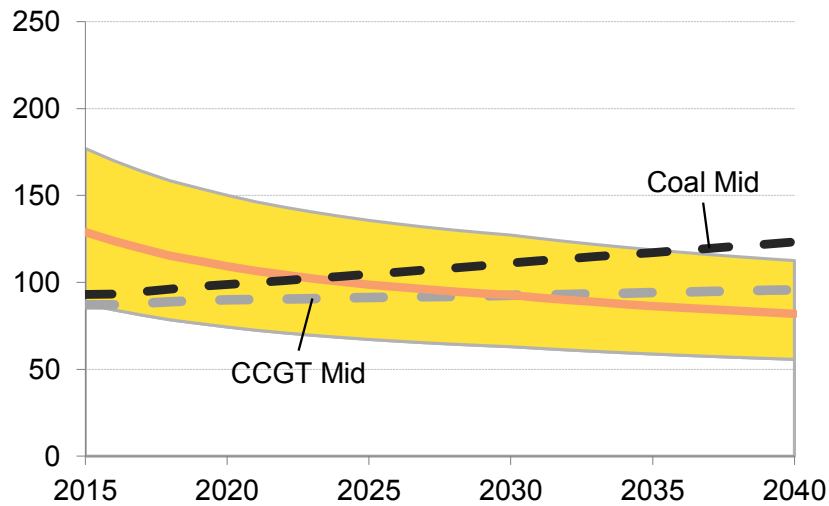
\$5.2 trillion more investment than under BAU



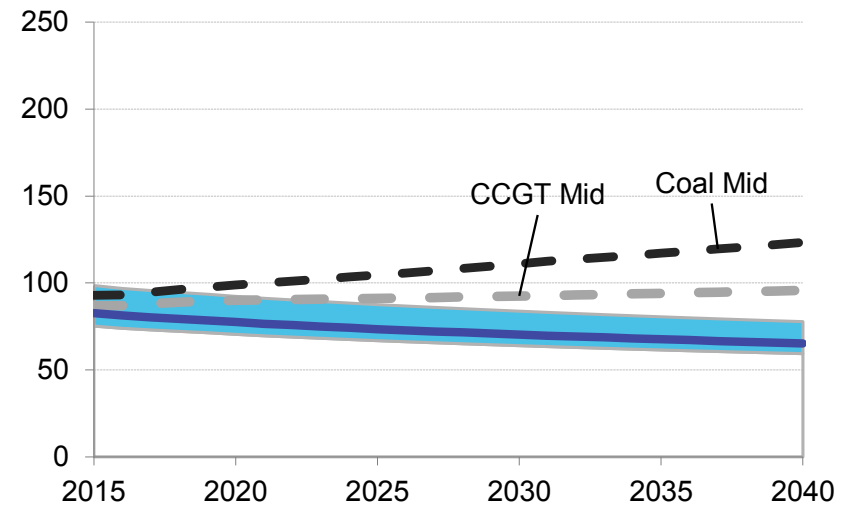
- Annual investment in new renewables (excluding large hydro) builds through the 2020s, then peaks in 2031-2035. Capacity build accelerates 2015-2035, then slows slightly 2036-2040 ultimately to total 12,500GW globally.
- Wind accounts for 46% of new-build investment in the first decade before shifting closer to 36% by 2036-2040. Solar's role grows from 43% of new-build investment 2015-2015, to 62% by the final five-year period.
- These changes in market penetration levels are due to anticipated cost shifts, augmented by the potential for distributed solar to be highly cost-competitive as it offsets power consumed at the retail level.
- Note that this projection of expanded market penetration does not take into account the further improvements in new renewable LCOEs over this period, resulting from the accelerated deployment above NEO BAU being modeled. This factor adds a further conservative element to the analysis.

POWER GENERATION ECONOMICS – MAJOR OECD COUNTRIES (\$/MWH)

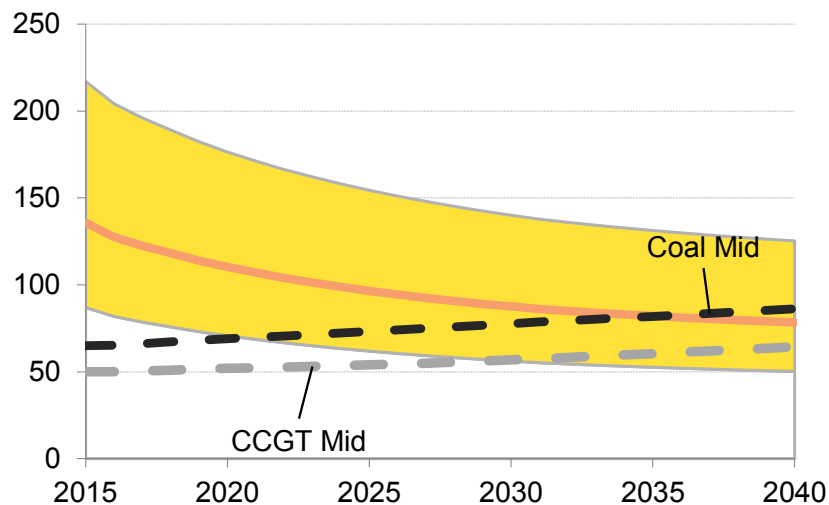
EU – SOLAR VS FF



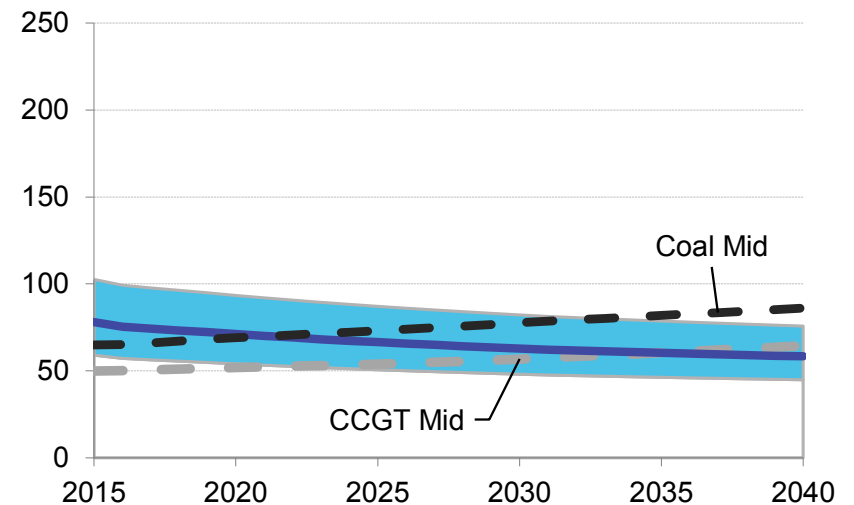
EU – ONSHORE WIND VS FF



US – SOLAR VS FF

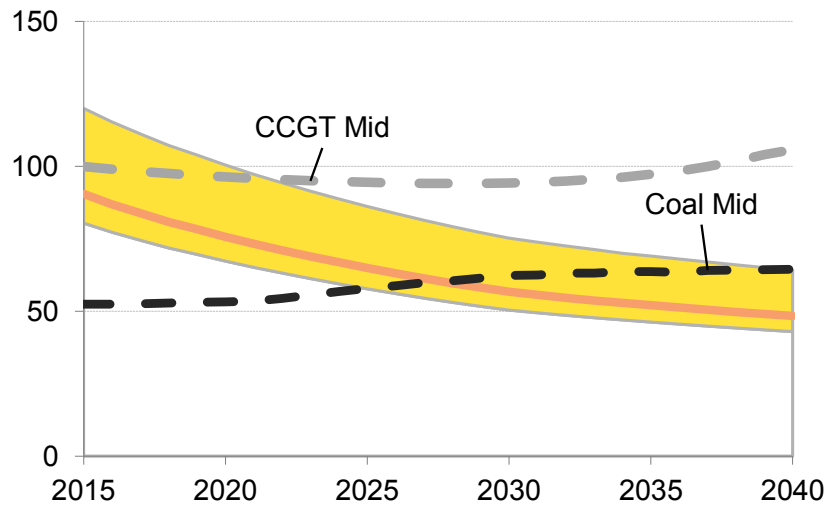


US – ONSHORE WIND VS FF

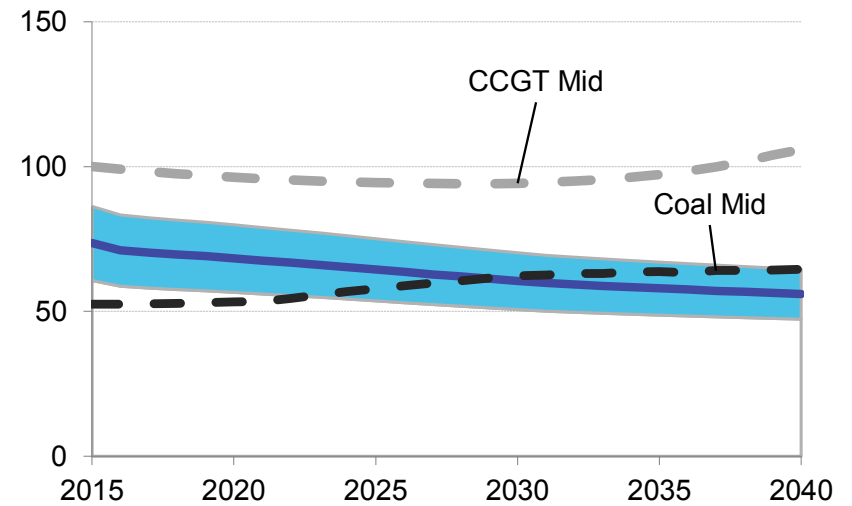


POWER GENERATION ECONOMICS – MAJOR NON-OECD COUNTRIES (\$/MWH)

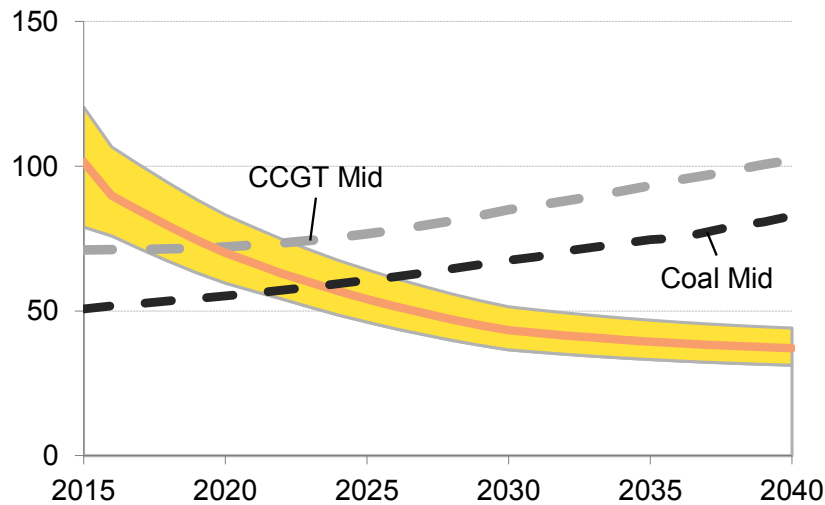
CHINA – SOLAR VS FF



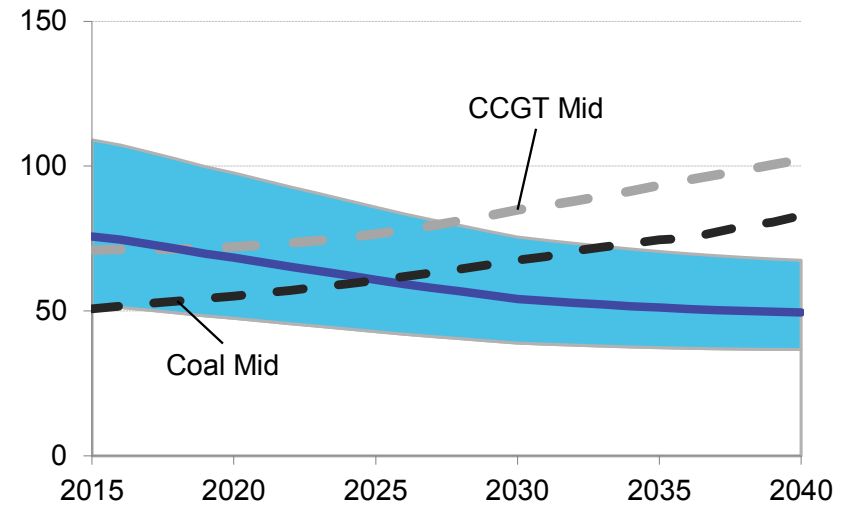
CHINA – ONSHORE WIND VS FF



INDIA – SOLAR VS FF

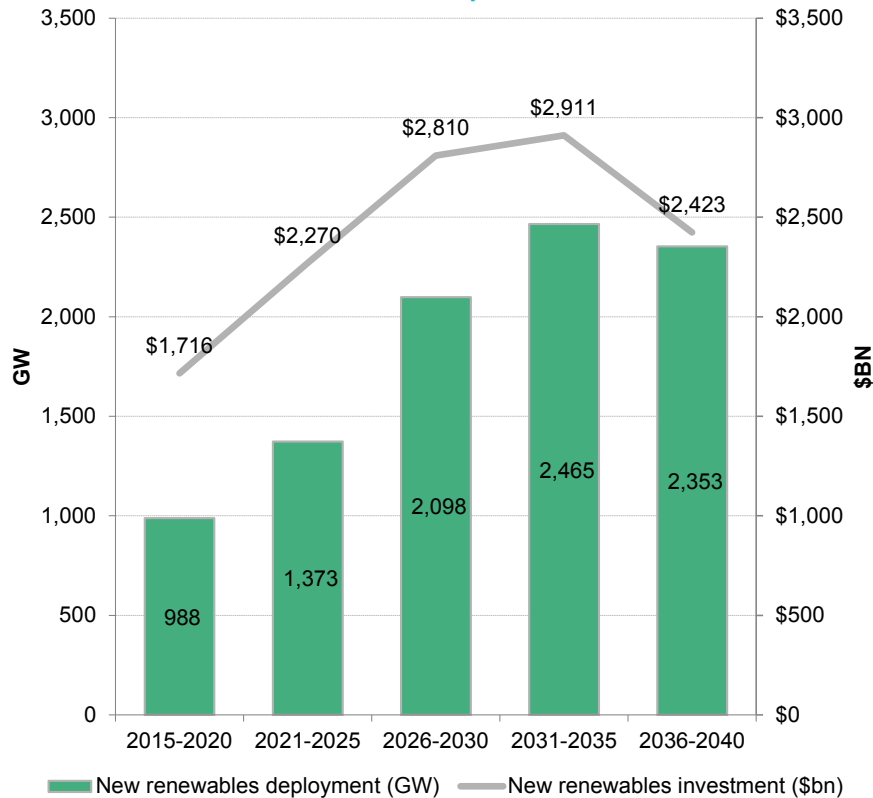


INDIA – ONSHORE WIND VS FF

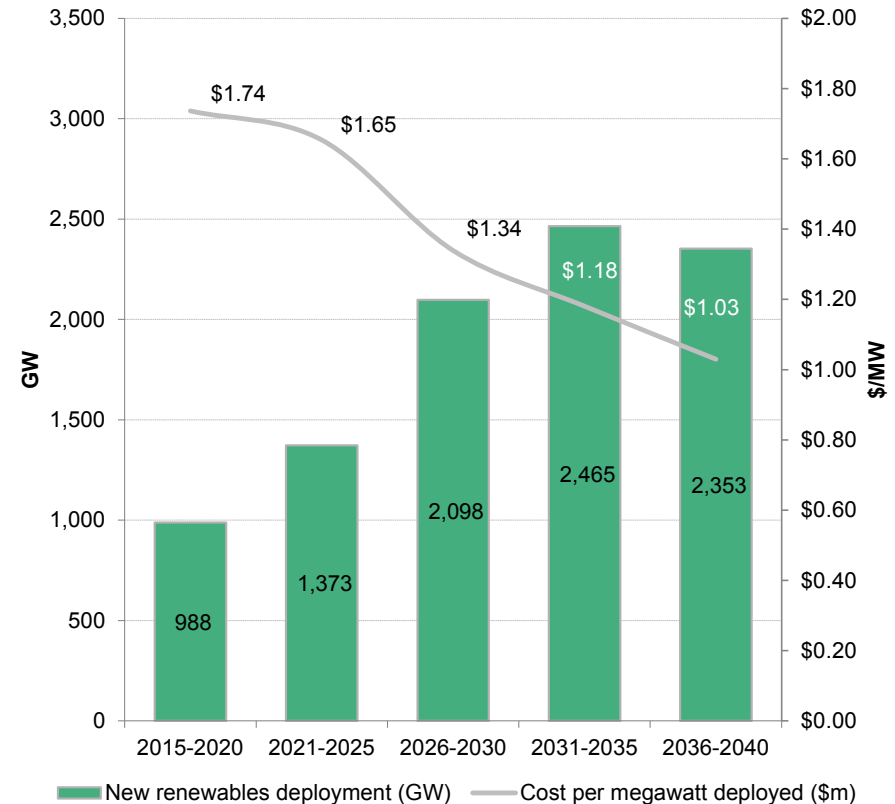


DEPLOYMENT VS COST (GW, \$BN REAL, \$/MW)

2°C NEW RENEWABLES BUILD VS TOTAL \$ COST

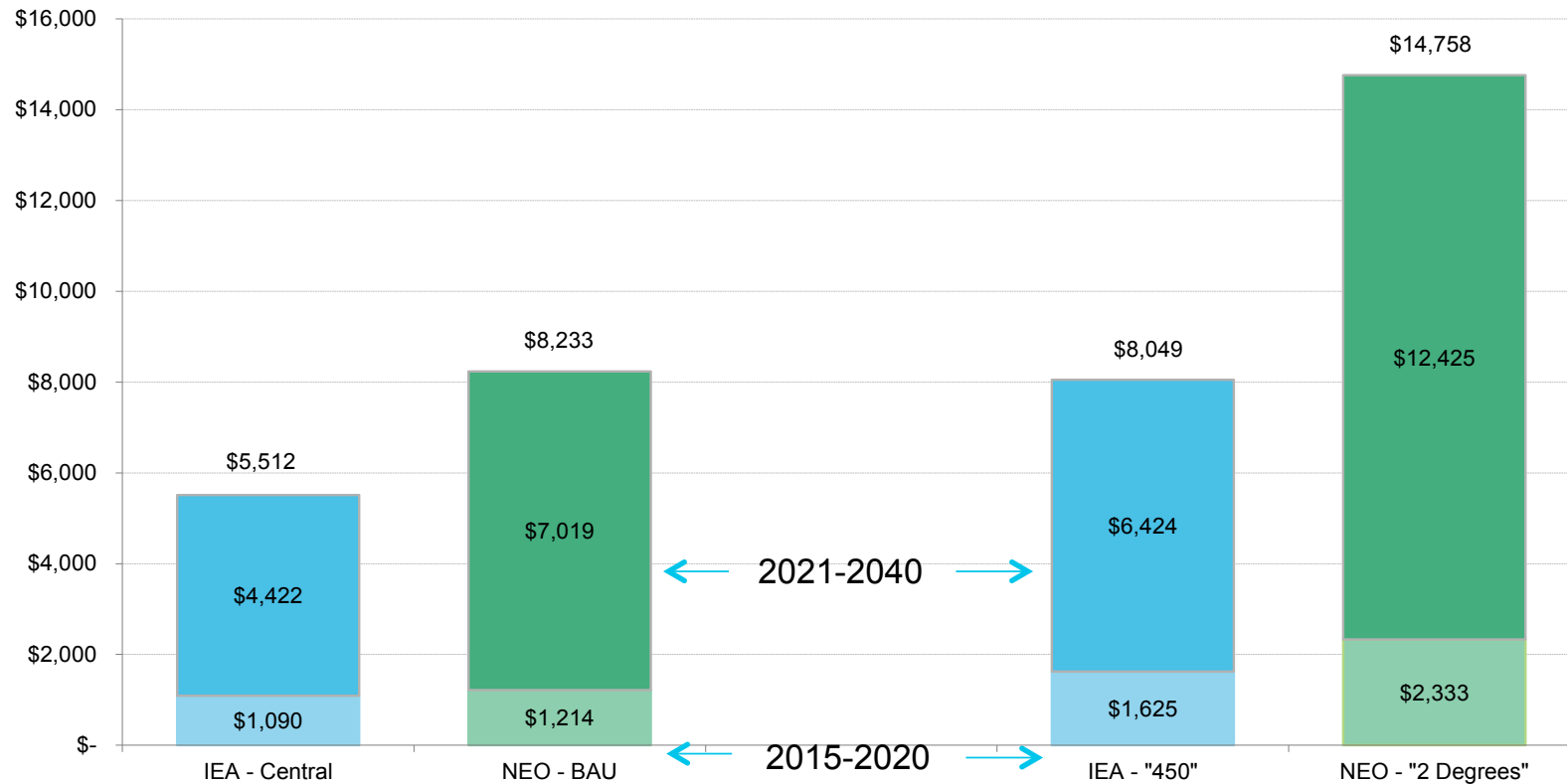


2°C NEW RENEWABLES BUILD VS \$/ MEGAWATT CAPEX COST



- Both new renewable capacity deployment and investment (as shown in chart on left) are due to rise significantly under a 2°C Scenario, with activity peaking in the 2031-2035 time period.
- Meanwhile, the cost per unit of clean energy (the \$ per megawatt of capacity added cost) is due to decline consistently through the full 25 years, sinking from an average of \$1.74/MW in the 2015-2020 period to \$1.03/MW by the 2036-2040 period.

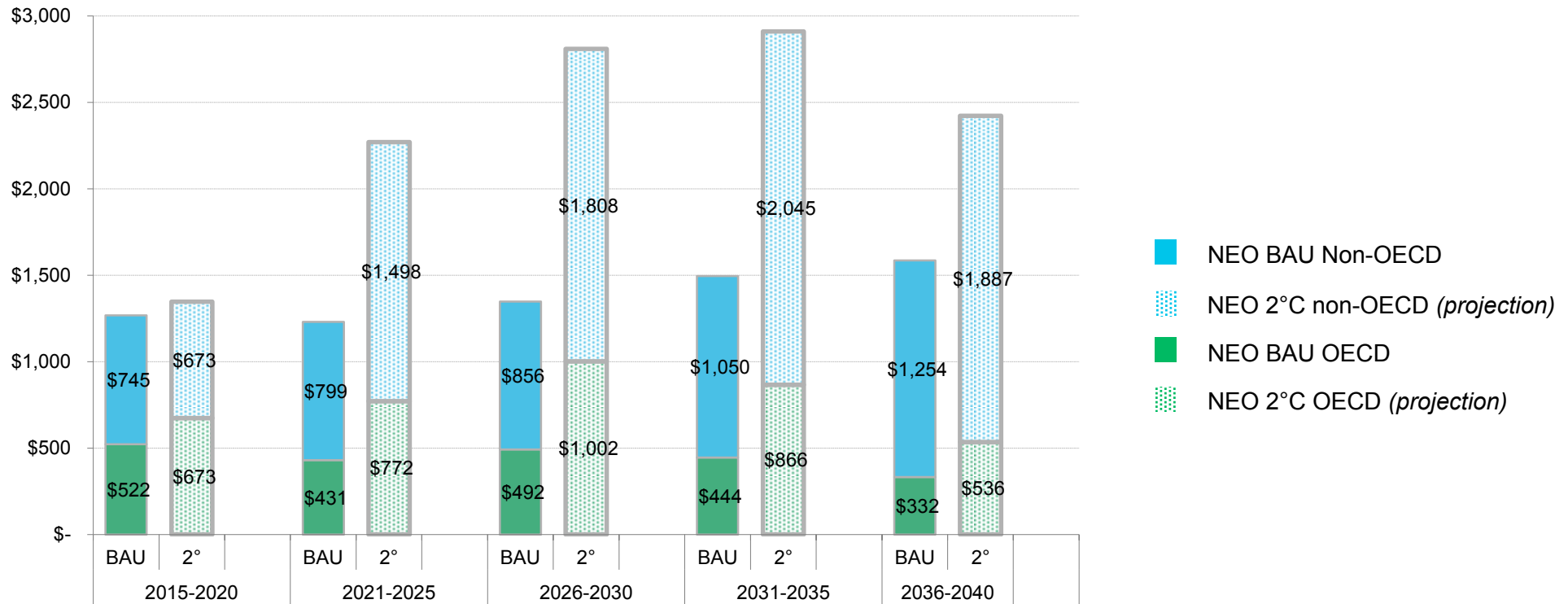
BNEF, IEA CENTRAL AND 2°C FORECASTS FOR NEW RENEWABLE BUILD TO 2040 (\$BN REAL)



- Both BNEF and IEA have long-term forecasts for non-hydro renewables investment. BNEF is significantly more bullish on new renewables due to more aggressive expected LCOE declines for wind and solar, in particular.
- IEA's "450" forecast, which also seeks to address a world where significant changes occur to address the climate crisis, assumes much higher build rates for nuclear, large hydro, and for coal equipped with carbon capture & sequestration ("CCS") than does the BNEF forecast. BNEF modelling does not support CCS attaining the levels of cost competitiveness anticipated by IEA.
- Interestingly, BNEF's BAU forecast expects slightly greater investment in new renewables than under IEA's more aggressive 450 forecast, and BNEF's 2°C forecast expects \$6.7 trillion in additional new renewable investment over IEA 450.

Note: IEA forecast is 2014-2040 while BNEF's is 2015-2040. IEA's forecast uses 2013 USD while BNEF uses 2014 USD. Sources: BNEF, IEA

OECD VS NON-OECD INVESTMENT: BAU AND 2°C WITH BAU ASSUMPTIONS APPLIED (\$BN, REAL)



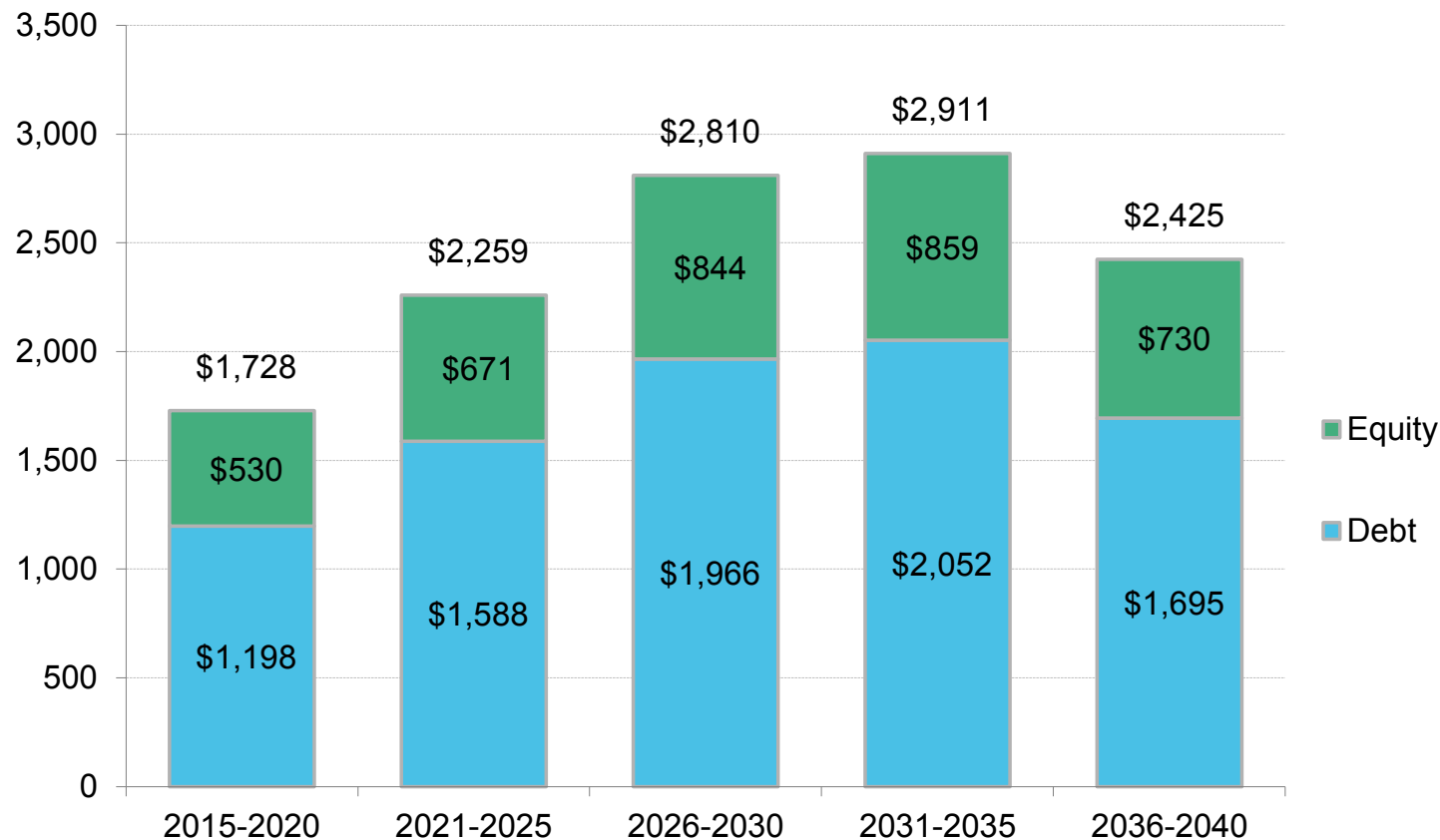
- NEO BAU forecasts deployment of new renewables in individual markets around the world and specifically anticipates that the majority of new capital deployed for new renewables will go into more rapidly expanding non-OECD energy markets. In fact, in 2015, total clean energy investment was already roughly equal between OECD and non-OECD countries.
- NEO 2°C is geographically agnostic, and makes no specific forecasts on emerging market activity. However, if the BAU ratio of OECD/non-OECD deployment is applied to the 2°C scenario, non-OECD countries would again attract the large majority of new funds.
- Changes in rates of non-OECD market expansion suggested here will be challenging for less mature financial markets. While global capital *availability* for new renewables seems unlikely to pose significant market development hurdles, investment *appetite* for exposure in many of these more recently developing markets may lag demand.
- Bridging the resulting shortfall has traditionally been the purview of multilateral development banks, development finance agencies and other public funders. An expanded role for these organizations seems likely to be required to adequately mitigate non-OECD market risk, and facilitate the accelerating new renewable buildout in these areas. An increased mobilization of local capital resources to support new renewable development may also play a significant role in meeting investment demand in certain markets.



**FINANCING THE
BUILD-OUT FOR NEW
RENEWABLE POWER**

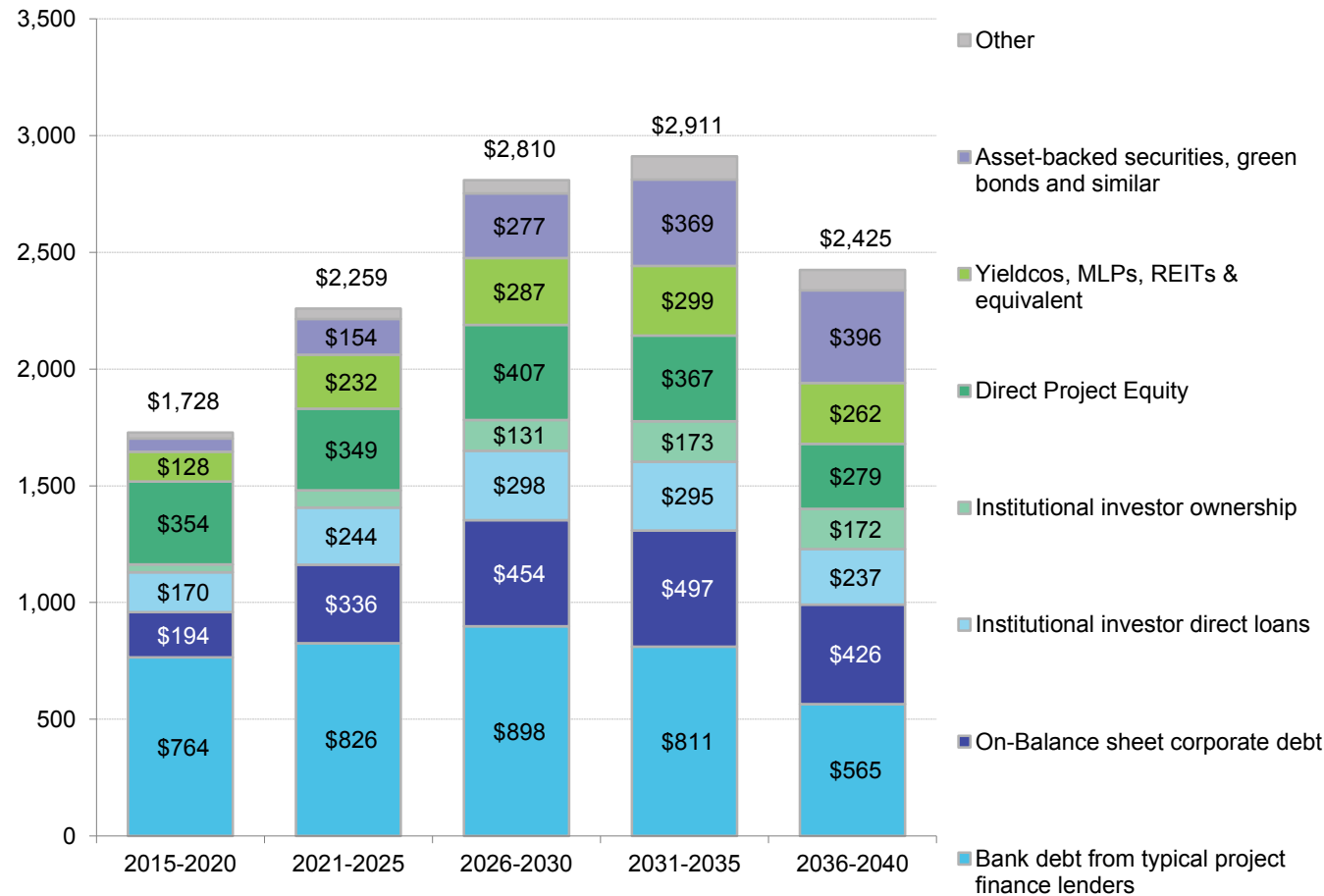
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POTENTIAL DEBT/EQUITY RATIO FOR RENEWABLES FINANCINGS UNDER NEO 2°C (\$BN, REAL)



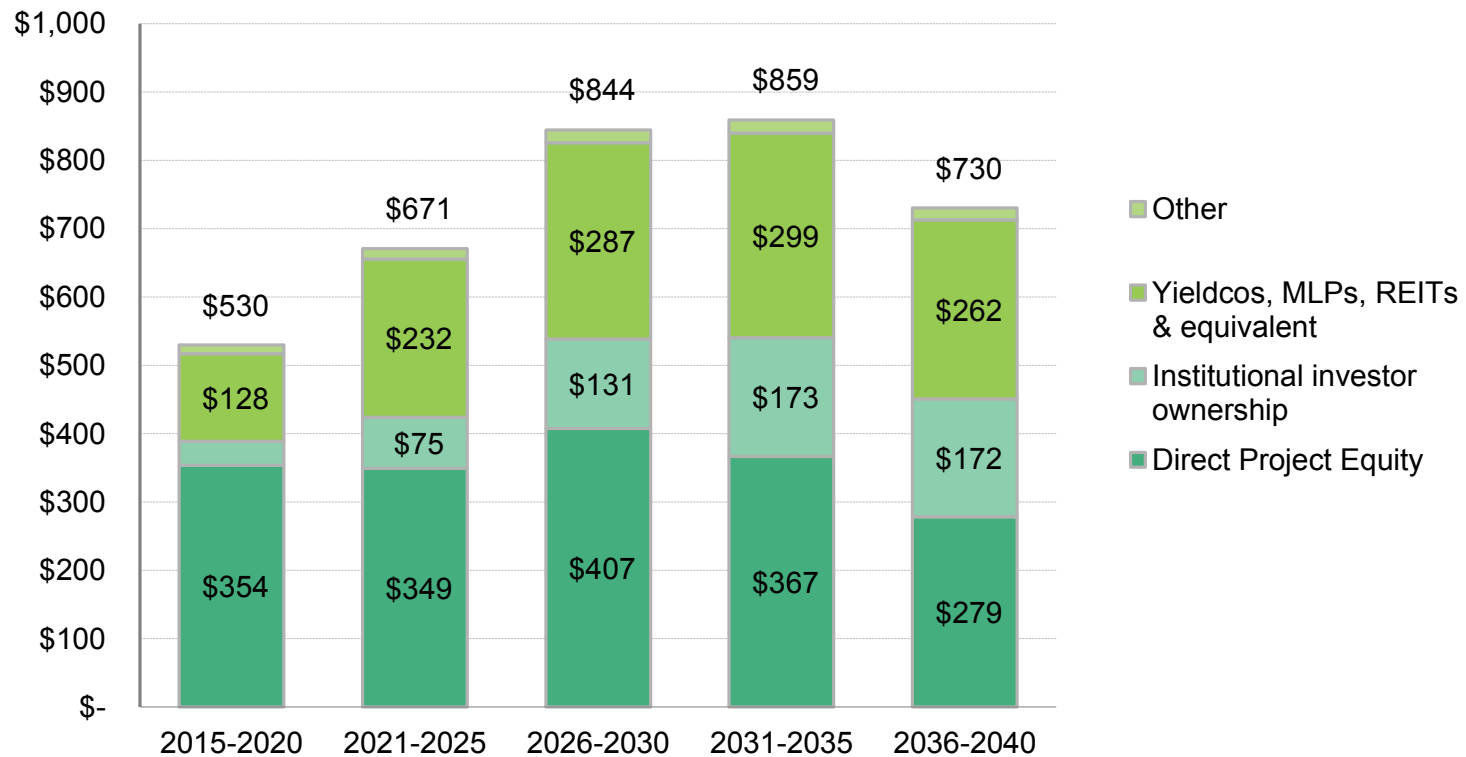
- The current global average debt:equity ratio for energy infrastructure stands at approximately 70%:30%. Overall, this relationship is not expected to change dramatically over the period
- Offsetting dynamic factors combine to yield this potential stability: maturing RE investment sectors in OECD countries will allow for higher leverage overall in these countries. However, non-OECD countries will account for expanding and ultimately larger overall share of RE investment. These markets, by definition in earlier stages of investment development, will generally require higher levels of equity commitments.

POTENTIAL INVESTMENT IN NEW RENEWABLES BY ASSET CLASS, NEO 2°C SCENARIO (\$BN, REAL)



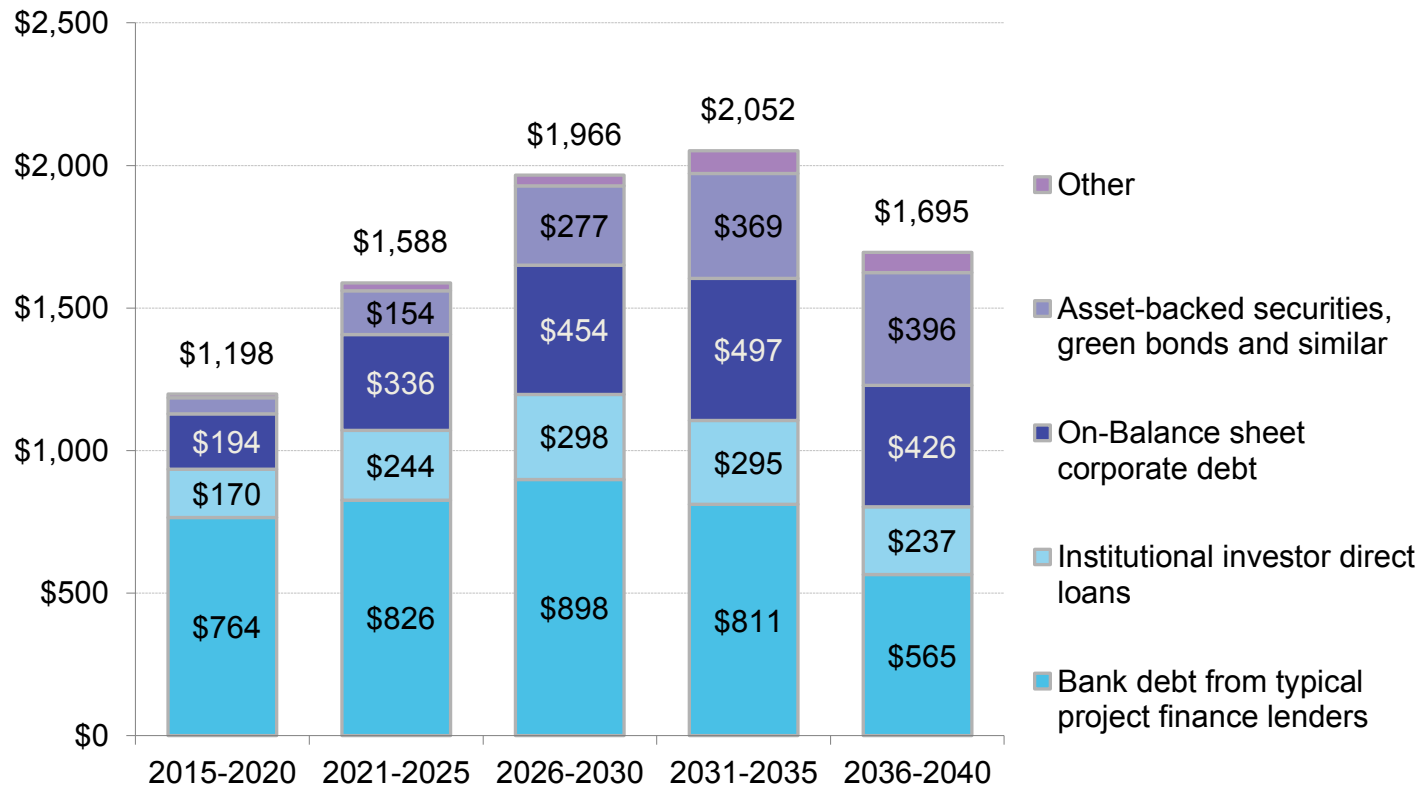
- To date, the vast majority of clean energy power generation debt has been financed through direct loans from project finance institutions, such as major banks.
- However, other industries raise similar or much larger volumes of capital in a wider diversity of ways. As perceptions of risk mature, similar results can be expected for new renewables.
- As clean energy continues to scale, the industry will expand the variety of sources of capital it taps to grow, with expanding investment opportunities in virtually every new renewable asset class.

POTENTIAL EQUITY INVESTMENT PATHWAYS FOR NEW RENEWABLES, 2°C SCENARIO (\$BN, REAL)



- Several trends are poised to influence the equity side of the clean energy project finance equation.
- Falling costs for clean energy could make system “hosts” (in the case of distributed solar) and corporates (in the case of commercial and utility-scale renewables) more inclined to hold direct project equity.
- As the low-risk / reliable-return opportunity of these assets becomes more apparent, investment via public-market vehicles exemplified by US “yieldcos”, master limited partnerships (MLPs) and real estate investment trusts (REITs) appears likely to spread.
- Finally, as clean energy becomes increasingly mainstream, it could find a home in the portfolios of the largest institutional infrastructure investors, such as pension funds and others, via direct investment.

POTENTIAL DEBT PATHWAYS FOR NEW RENEWABLES, NEO 2°C SCENARIO (\$BN, REAL)



- Bank debt from typical project finance lenders (and in the case of the US, “tax equity providers”) has been vital for clean energy to date and will continue to be. Still, its share of overall debt could decline from 64% in the next five years to 33% by 2036-2040, as the sector matures and seeks alternative debt sources.
- Direct debt from institutional infrastructure investors could provide up to 15% of all debt as pension funds and others take a greater interest. On-balance sheet financing is poised to rise substantially, particularly as major utilities take a more active stance in developing projects and then refinancing them through corporate debt offerings.
- Finally, as more capacity gets built, particularly aggregated small distributed-scale solar capacity, the opportunity to refinance such portfolios through asset-backed securities offerings appears poised to rise.

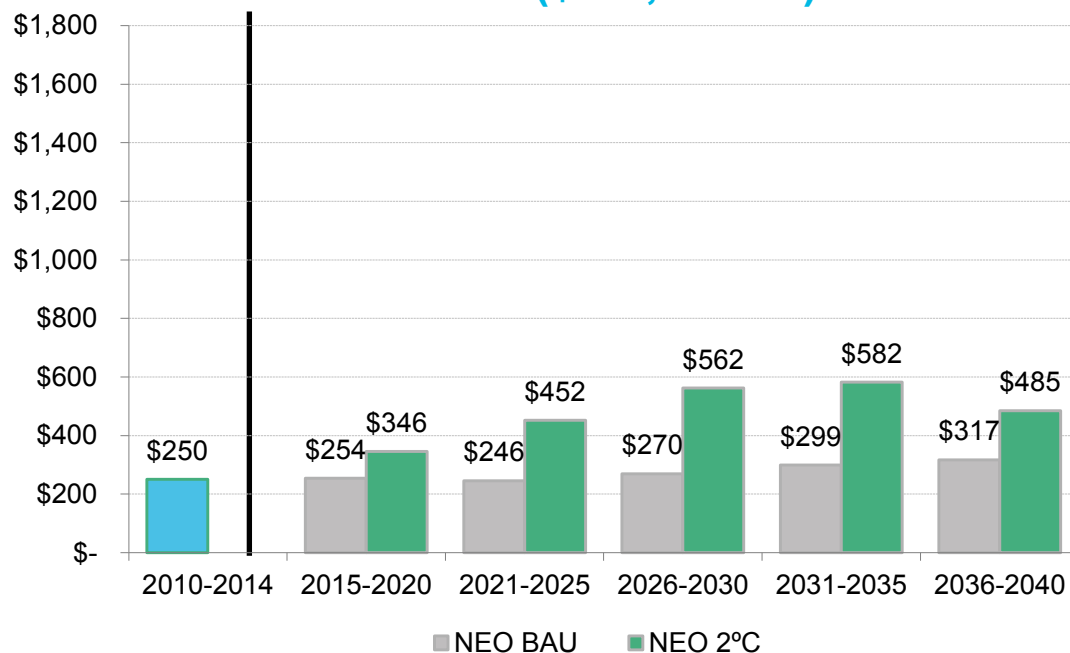


CONTEXTUALIZING THE OPPORTUNITY

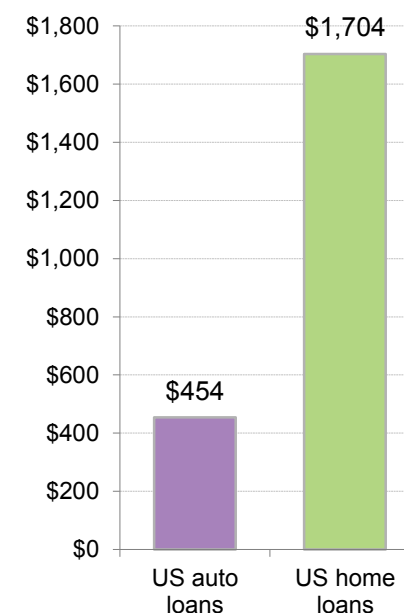
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HOW BIG IS THE LIFT?

AVERAGE ANNUAL INVESTMENT NEEDS FOR GLOBAL NEW RENEWABLE POWER GENERATION (\$BN, REAL)



ANNUAL ORIGINATIONS FOR US AUTO LOANS, US MORTGAGES (\$BN)

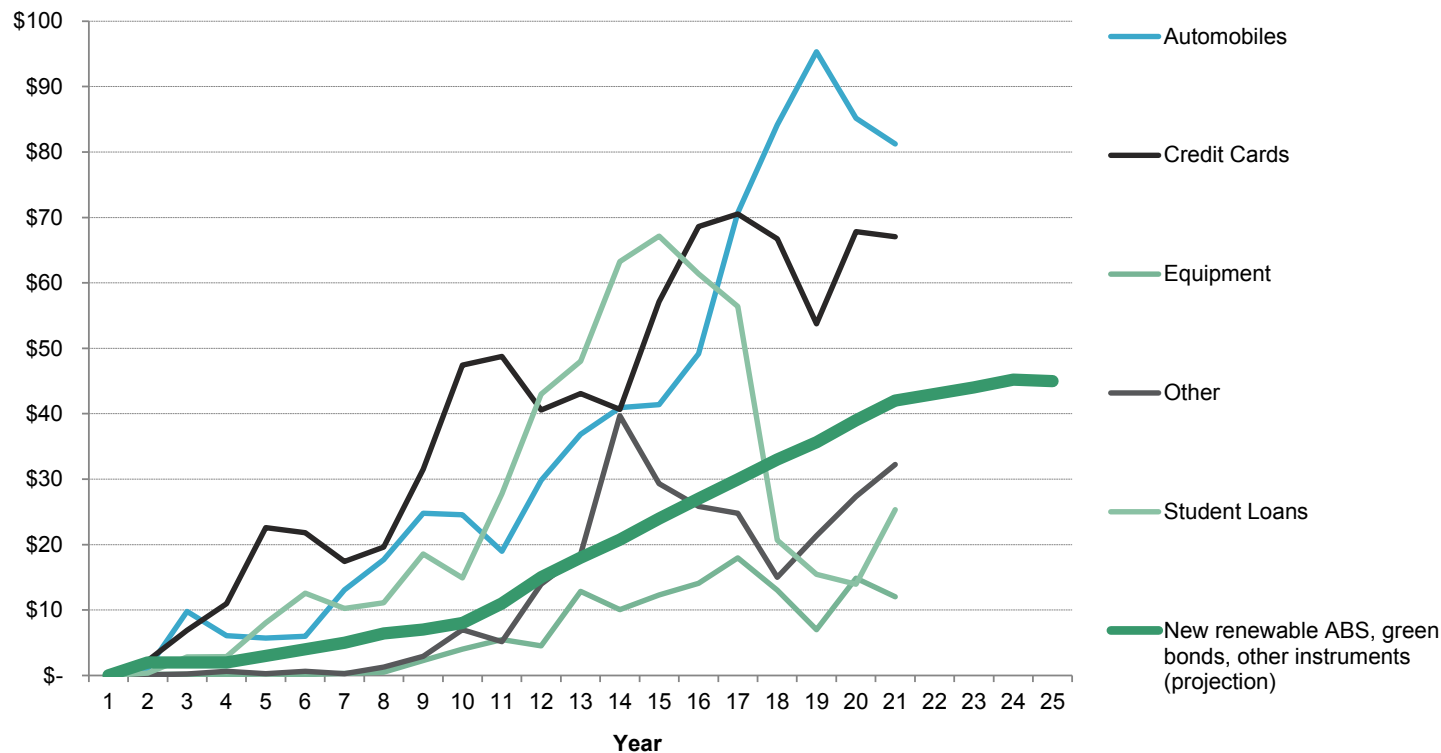


- From 2000-2014, an average of \$250bn/year was invested in new renewable power generation (utility-scale projects and small, distributed capacity). In 2015, that figure hit \$266bn. Under the 2°C scenario, up to \$582bn/year will be required for this purpose by 2021-2035. At its widest, the gap between BAU and 2°C will hit \$292bn/year.
- While this is no small sum, it is far less than what Americans alone have historically borrowed to finance new cars per year and far, far below average annual US mortgage originations.
- Discussions with financial experts suggest that in no case is the projected growth in any specific new renewable finance subsector so large that it appears likely to disrupt normal commercial investment flows. One example can be seen in the following discussion of asset backed security markets.

Source: BNEF

Source: Federal Reserve Bank of New York Note: Based on five-year average 2011-Q3-2015

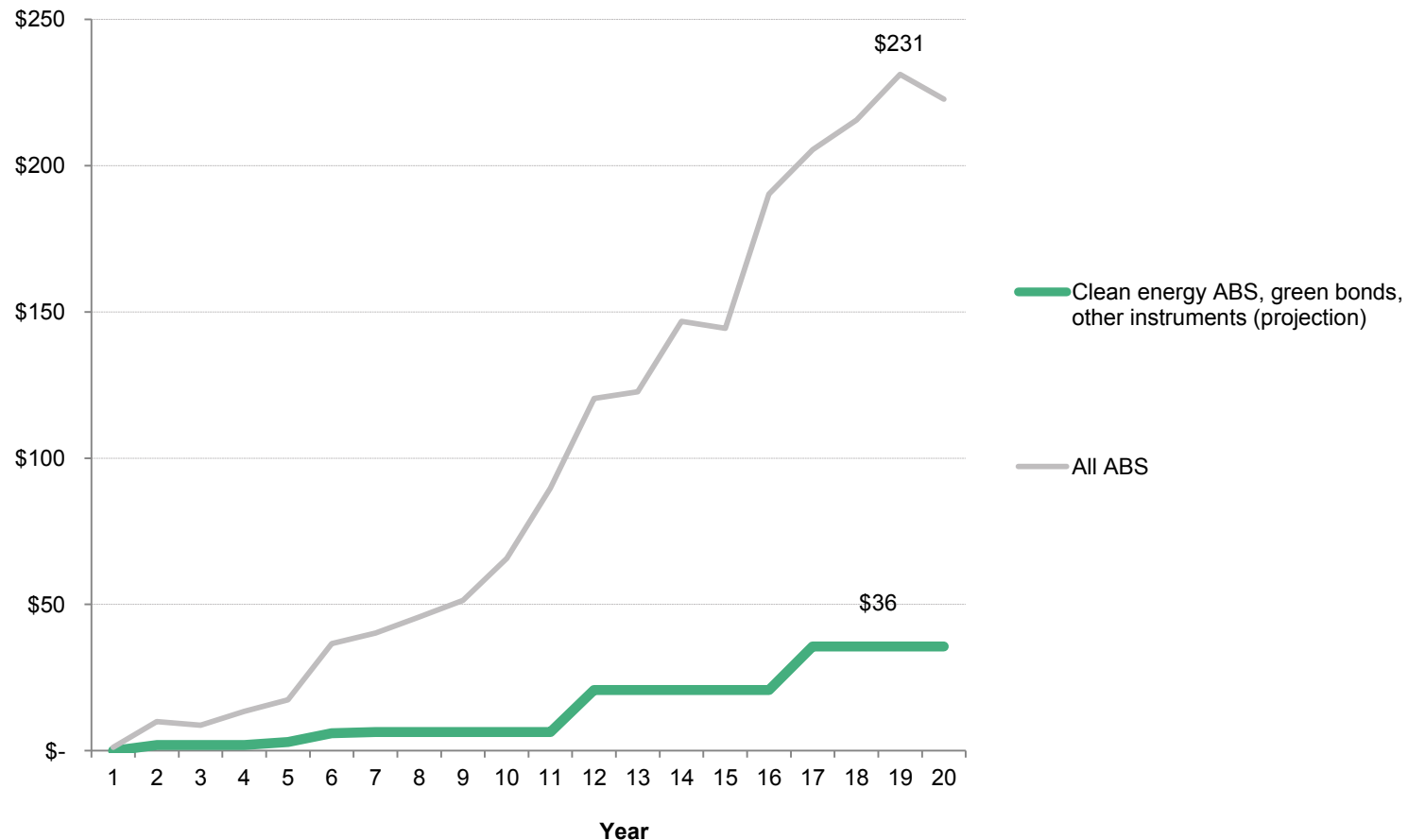
THE POTENTIAL LIFT: ASSET-BACKED SECURITY ISSUANCES VS. A PROJECTION FOR GLOBAL NEW RENEWABLES ABS (\$BN)



- The financial markets have employed asset-backed securities (ABS) for over two decades to securitize credit obligations. ABS have allowed investors to benefit from the cash flows generated from loans outstanding to consumers on cars, equipment, student loans and credit cards. ABS for each of these separate sectors were launched in different years. The figure above charts the rate at which investment poured into each sector from its initial year as an investable option.
- Under the MTG projection, ABS *and* green bonds fundraising for new renewables would rise from near zero \$ now to approximately \$45bn/year 25 years from now. This is not an unreasonable projected growth path, considering the rate at which ABS use has grown in the financing of other assets. Some recent projections of significantly higher future levels of ABS financing in the new renewables space, if achieved, would only serve to enhance the cost competitiveness of the sector.

Source: Sifma

THE LIFT: TOTAL ANNUAL ABS ISSUANCES VS POTENTIAL CLEAN ENERGY ABS + GREEN BONDS, ANNUAL (\$BN)



- Compared to the total amount raised each year in the ABS market (depicted above), the projected required annual ABS, green bonds, and other instruments would represent just a fraction of the historical investment recorded over the 20-year periods studied.
- Twenty years into its existence, the ABS market as a whole was raising \$231bn per year. The MTG outlook suggests total clean energy ABS and green bond volume would reach just \$36bn annually in 20 years.

Source: Sifma



**FROM BAU TO 2°C:
BASIC POLICY
BUILDING BLOCKS**

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A wide variety of policy solutions have been tested at local, national, and international levels to boost clean energy deployment and speed progress toward a 2°C world. Among those that have proven successful to date (listed in no order of priority):

- **Carbon taxes** that put a price on emitting harmful CO₂ to encourage alternative, zero-carbon sources of generation or demand reduction.
- **Carbon cap-and-trade systems** that price CO₂ emissions while giving market participants the opportunity to trade credits to meet overall emissions reduction goals.
- **Tax incentives** use the tax code to subsidize the development of clean energy. These include accelerated depreciation for investment in clean power-generating plants or manufacturing facilities. It also includes credits tied to a clean power project's output or overall capex. In addition, there is increasing interest in phasing out fossil fuel subsidies long deployed in support of high carbon resources.
- **Feed-in-tariffs** that enable clean power generators to sell their electricity at a premium above typical market rates.
- **Net energy metering programs** that allow distributed clean energy system owners, such as homeowners with photovoltaic systems, to “sell” their excess power back to the grid.
- **Clean energy targets** set by government that require utilities to produce or procure certain levels of zero-carbon power. Typically, these involve annual goals which rise over time.
- **Tenders for clean power contracts** create opportunities for renewable energy project developers to bid to provide zero-carbon electricity over a period of years.



CONCLUSIONS

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- Meeting the challenge of limiting global warming to 2°C or below presents a \$12.1 trillion investment opportunity in new renewable electric power generation over 25 years, or \$485bn/yr on average. The “gap” between meeting this challenge and investment already forecast to occur anyway is \$5.2 trillion, or \$208bn/yr over 25 years.
- While hardly insubstantial, these sums are dwarfed by activity underway in the world’s financial markets. Americans alone borrow more to buy cars in a single year than the annual capital required worldwide for clean energy power generation, to name but one example. In short, the commercial capital to reach this goal *can* be sourced.
- As the market grows, a wider variety of mainstream investment vehicles will be employed to exploit the opportunities and to provide lower-cost capital. In essence, clean energy financing, like the asset class it supports, is poised to “grow up” to more fully resemble other, better established infrastructure sectors such as transportation or real estate, from a financial structure perspective.
- These new finance vehicles will present massive new opportunities for capital deployment, not least for institutional investors who to date have actually been offered limited options in the developing clean energy arena. Indeed, it is safe to assume that as clean energy permanently sheds the “alternative” moniker and moves firmly into the mainstream, it will inevitably account for expanding and significant shares of infrastructure investors’ portfolios.

- The expected significant expansion of new renewable financing in non-OECD markets will offer corresponding opportunities for broadened international investment. Facilitating this transition demands continued market development support for these rapidly growing markets by public funders.
- Expanding clean energy investment opportunities are available now, under existing policy frameworks and market conditions, yet investors are not likely to mobilize sufficient funds to fully close the divide between what will happen under a business-as-usual scenario and what should happen (temperature increase $<2^{\circ}\text{C}$) unilaterally. Policy makers need to “mind the gap” to ensure that investment grows at the speed and scale required. This highlights the critical role of the “ratcheting” mechanism in the Paris Climate Agreement, among other tools.

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sales.bnef@bloomberg.net

Ethan Zindler

ezindler@bloomberg.net

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