



Financing the Green Transition: Financial Innovation to Mobilize Capital

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Overview

Framing and scene-setting

- Lots of \$\$ needed, lots of \$\$ available, challenges remain

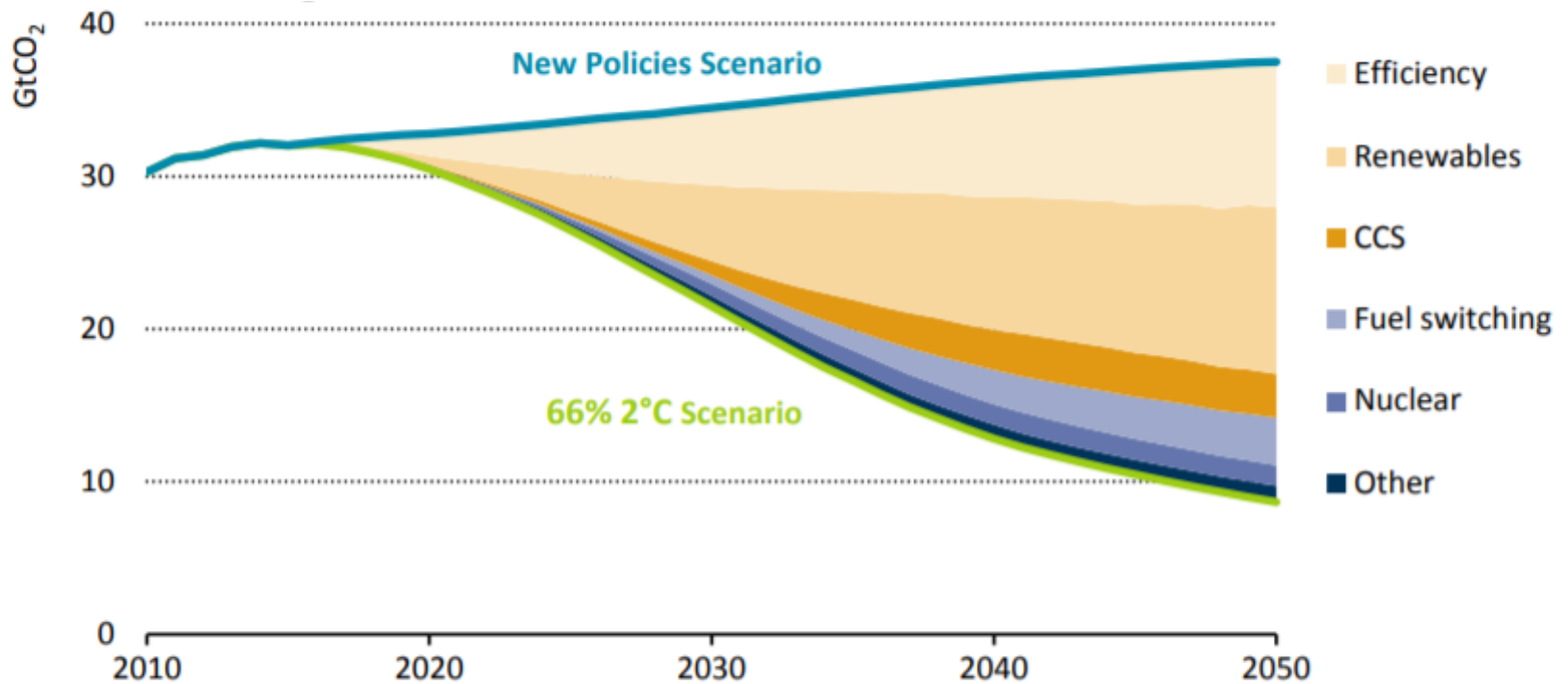
Accessible assets: focus on green bonds

- Part of the green finance portfolio – more required

Enabling the project pipeline

- Early-stage funding (PPFs)
- De-risking (co-lending)
- Scaling (aggregation & securitization)

Massive capital needs for a massive energy transition



\$2.4 trillion/year through 2035 to limit climate change to 1.5° C (IPCC)

\$3.5 trillion per year to achieve 2DS (IEA)

Source: [IEA/IRENA](#)

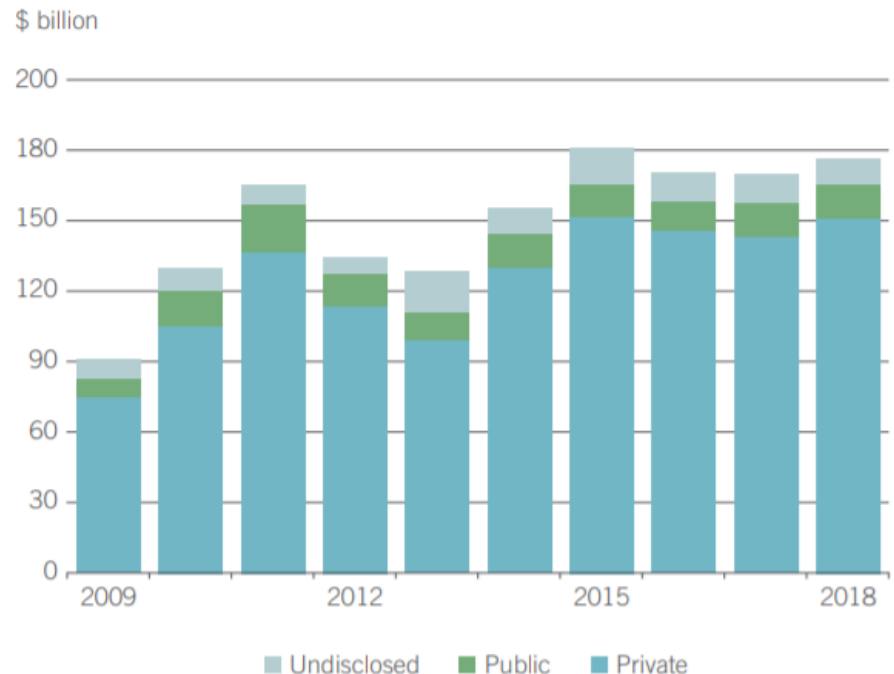
Massive capital needs for a massive energy transition

Public funds are expected to meet only a small portion of those needs

“Sustainability themed investing” totaled just \$1 trillion in 2018 (Global Sustainable Investment Alliance)

Global clean energy investment ~\$350 billion in 2018 (BNEF)

Global clean energy asset finance (excluding China) by public and private investors⁵⁰



Source: BNEF. Note: Excludes deals smaller than \$1 million. Analysis done on \$1.5 trillion in asset finance.

The good news is that investor appetite is strong...

That \$1 trillion of sustainability-themed investments in 2018 was 4x the 2016 level.

Institutional investors, e.g. pension funds are directing large scale funds to ESG.

ESG ratings are proliferating in traditional asset classes as are “exclusionary” investment strategies that preclude certain investments based on ESG criteria, ~\$19.8 trillion AUM in 2018. That capital will have to be deployed in alternative ways.

... But challenges remain

Early-stage financing is inherently risky. New green energy technologies still need to demonstrate proof of concept and pre-construction funding can be difficult to access.

There are considerable investment opportunities in **new, higher risk markets**, in which investors may not be confident that projects will be completed successfully.

Disaggregated and heterogeneous projects face **limited liquidity**. Investors looking to deploy large amounts of capital often don't have the appetite for due diligence on small-scale investments.

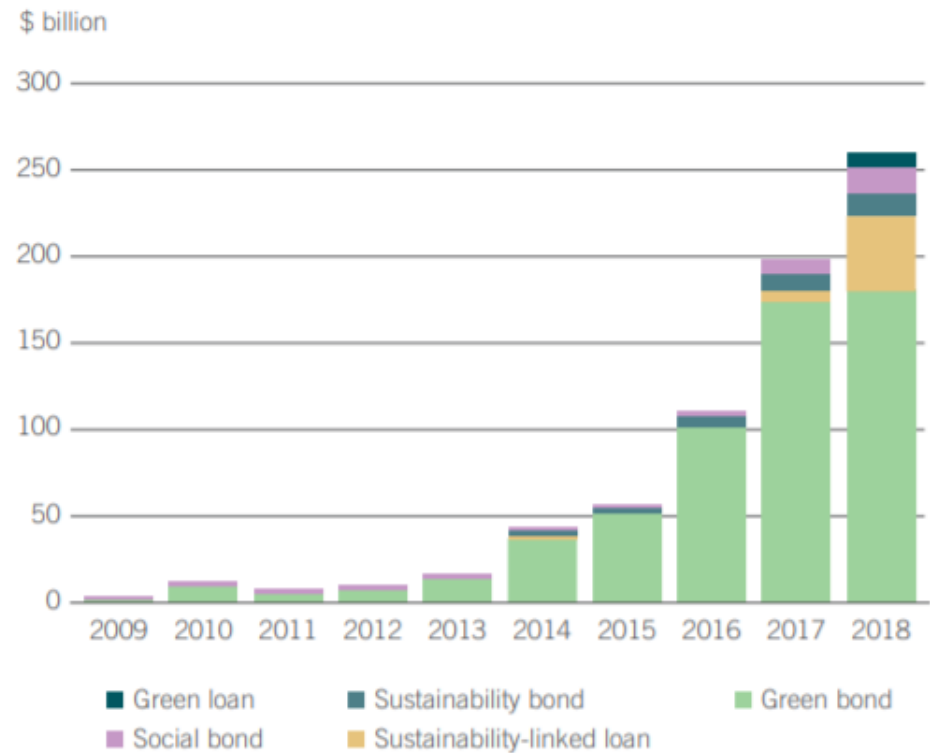
Green bonds

Since first green bond issuance in 2009, cumulative issuance = 1/2 trillion dollars; 2018 issuance = \$182 billion.

Green bonds are familiar and accessible.

Growing the issuance pie, not investor appetite, is what limits growth of this asset class

Global Issuance of Sustainable Debt Finance



Source: [BNEF via CFLI](#)

Green bonds

...effectively a refinancing tool, and generally not useful for **early-stage financing**.

...often too small for large **institutional investors**, who prefer to direct capital towards even bigger investments

...attract new investors and encourage transparency, but may or may not result in **additional new projects** that would not have happened anyway.

...still represent only **<0.5% of the total bond market** (Institute of International Finance)

Growing the Project Pipeline

Green energy projects can be perceived as inherently **risky** because they employ new technologies, rely on unconventional revenue streams, or exist in emerging markets

Concessional (public or philanthropic) capital can move projects forward by allowing them to **demonstrate viability** and leverage private capital

Two ways that concessional capital does this:

- De-risking early stage activities
- Co-investing with private funders

De-risking early stage activities

The Challenge:

Clean energy development needs **pre-construction funds** to conceive of the project and conduct R&D.

These funds are needed well before the project can be collateralized or generate revenue – i.e. **before the project is “bankable.”**

Market conditions can exacerbate **early-stage risk**, especially in emerging markets – unstable regulatory regimes, poor local resources, etc.

De-risking early stage activities

The Solution:

As the asset class matures, investors may become more comfortable with early-stage risk.

Until then, **project preparation facilities** (PPFs) bridge the gap.

- Grants
- Equity
- Low-cost loans
- Technical assistance
- Guarantees
- Co-funding

Co-Investment to leverage private capital

The Challenge:

It can be difficult to attract private finance for a commercially-viable project in **new or higher-risk markets**.

Investors may be hesitant to place capital in profitable projects when such projects involve relatively **new or unproven technologies**.

Co-Investment to leverage private capital

The Solution:

Concessional capital – alongside private investment - in unproven projects can demonstrate proof of concept and commercial viability.

In co-investment scenarios, public or concessional entities offer **credit enhancements, or accept first-loss risk or other credit subordination**, giving private investors the confidence to invest in multiples of the public sector contribution.

In the future, public entities might then sell down their project stakes to the private sector, though this sort of refinancing is not yet common.

Scaling investment via aggregation & securitization

The Challenge:

Institutional investors will be an increasingly critical source of capital for green projects. They deploy capital in large tranches - \$100 - \$300 million+

Many green projects are **heterogeneous and disaggregated** – e.g. distributed power generation, residential EE, or EV charging infrastructure.

While individual projects may in fact be profitable, the **transaction costs** associated with sourcing, negotiating, and de-risking them individually is untenable to large investors.

Scaling investment via aggregation & securitization

The Solution:

Aggregating a large number of small projects allows big investors to efficiently deploy large amounts of capital without uneconomic **transaction costs**.

Bundling projects can also **mitigate risk** – due to lack of historical data, lack of market maturity, or unproven credit worthiness – by creating a portfolio of diversified assets.

Would-be investors can also be “bundled” with the creation of a fund.

Scaling investment via aggregation & securitization

Another Solution:

Securitization creates a **tradable security** based on an underlying asset of bundled projects.

Investors can buy or sell stakes in the underlying portfolio, which is a **more liquid** way to access clean energy projects than direct investment.

Yieldcos are one successful example: they are publicly traded shares of vehicles that hold a portfolio of operational clean energy generation assets. Shareholders in yieldcos receive dividends funded by the cash flows from the wind or solar projects owned by the yieldco.

Key conclusions:

The capital requirements of an energy transition are massive, but so is theoretical investor appetite

The trick is to match that investor appetite to appropriate, climate-impactful projects, and effectively scale deployment

Green bonds are necessary, but not sufficient

Leveraging a relatively small public spend into much more sizable private-sector investment is also key to growing the green project pipeline

Private sector mechanisms such as ABS and yieldcos address scale

Thank You

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