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GLOBAL GREEN BOND REPORT 2016

EXECUTIVE SUMMARY

INTRODUCTION

Welcome to 'Global green bonds 2016', a brand new market report produced by Clean Energy Pipeline. This report contains a wealth of data and insight on the global green bond market. It includes profiles of the most active issuers and arrangers, detailed league tables that rank issuers, arrangers, legal advisors and second party opinion (SPO) providers, and a comprehensive list of all green bond issuances in 2015 and 1Q16. If that wasn't enough this report also includes detailed analysis of issuance trends.

We would like to thank the individuals (listed below) that gave up their time to be interviewed for this report. We hope you enjoy reading this report. As ever, we welcome all feedback.

INTERVIEWEES:

ARRANGERS

- **KEVIN SMITH**
Vice President, Environmental Markets Group, Goldman Sachs
- **MARILYN CECI**
Managing Director, Head of Green Bonds, JPMorgan
- **NAVINDU KATUGAMPOLA**
Head of Sovereign, Supranational, Agency Origination & Head of Green & Sustainability Bonds, Morgan Stanley
- **HANS BIEMANS**
Head of Sustainability, Rabobank
- **MATS OLAUSSON**
Senior Advisor, Sustainable Products and Product Development, Fixed Income and DCM, Global, SEB
- **JONATHAN WEINBERGER**
Managing Director, Debt Capital Markets, Société Générale
- **ANTONIO KEGLEVICH**
Head of Green Bond Origination, UniCredit

ISSUERS

- **BODO WINKLER**
Head of Investor Relations/Credit Treasury, Berlin Hyp
- **ARTHUR LEIJGRAAFF**
Senior Treasury Officer, FMO
- **ESHOE DENISE ODARO**
Investor Relations, IFC Treasury, IFC
- **LEONIE SCHREVE**
Head of Sustainable Finance, ING
- **OTTO WEYHAUSEN-BRINKMANN**
Head of New Issues, KfW
- **BJORN BERGSTRAND**
Senior IR Manager & Head of Sustainability, Kommuninvest
- **JANIS IRBE**
Group Treasurer, Latvenergo
- **ANTTI KONTIO**
Funding Manager, MuniFin
- **LARS EIBEHOLM**
Head of Treasury, NIB
- **JEROEN DICKER**
Group Treasurer, TenneT
- **LAURA TLAIYE**
Sustainability Adviser, Capital Markets, World Bank

INVESTORS/SPOs

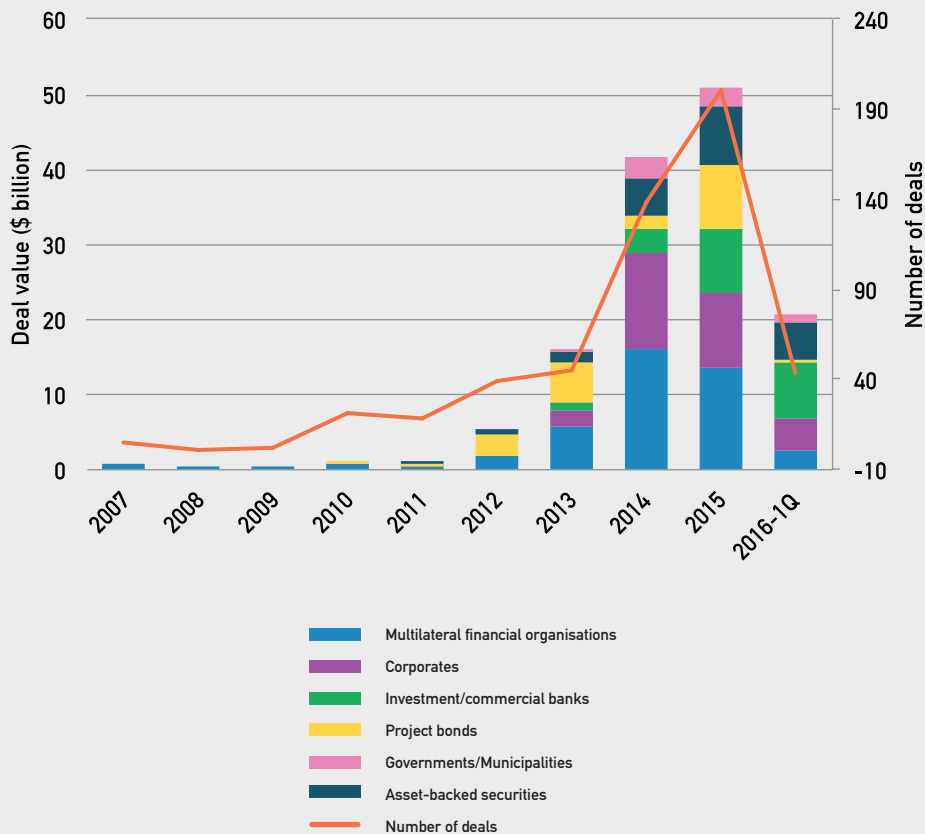
- **OLIVIER VIETTI**
Fixed Income Fund Manager, AXA Investment Management
- **ANDRE SEVERINO**
Head of Fixed Income for the US and Europe, Nikko Asset Management
- **MARTINA MACPHERSON**
Managing Partner, SI Partners – oekom research UK
- **VIKRAM PUPPALA**
Associate Director, Advisory Services, Sustainalytics

CRUNCHING THE NUMBERS – A RECORD YEAR FOR GREEN BOND ISSUANCES

An overview of investment trends is a good place to start. Green bond issuances totalled a record \$48.0 billion in 2015, a 15% increase on the \$41.8 billion of issuances in 2014. The surge was caused by a significant increase in issuances by investment/commercial banks (158% annual increase in value) and government/municipal organisations (67% annual increase) and a rise in the number of project bonds (300% increase).

The number and value of green bond issuances has now increased for a fifth consecutive year. That said, the 15% annual increase in issuances was less than market participants anticipated at the beginning of 2015.

GREEN BOND ISSUANCES (2007 - 1Q16)



Although the dollar value of corporate green bond issuances decreased 30% annually to \$8.9 billion in 2015, the number of corporate issuances notched up 9% to 38 placements. This represents a huge increase on the three corporate issuances totalling \$2.2 billion in 2013.

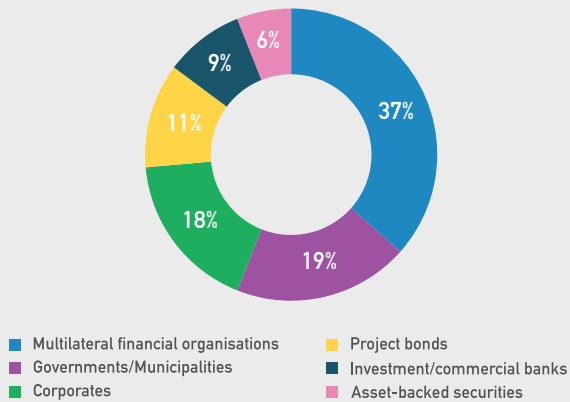
"We've gone from zero corporate issuances five years ago to corporates taking a significant share of the market," confirmed Andre Severino, Head of Fixed Income for the US and Europe, Nikko Asset Management. "For example Apple launched their green bond this year and some blue chip corporates are following suit. As an investor in green bonds we are excited about expanding into the investment grade corporate space."

A full list of issuances in 2015 (and 1Q16) is provided on page 72 of this report. Of the 216 green bonds placed last year, eight were above \$1 billion. Already, six billion dollar bonds have been placed 1Q16.

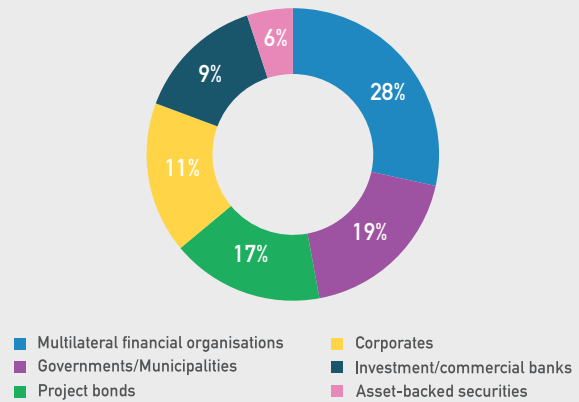
Some 138 organisations issued at least one green bond last year a 64% increase on the 84 organisations that issued in 2014. Some 37% of issuers were multilateral financial organisations, 19% were governments and municipalities and 18% were corporates. The remainder were investment or commercial banks or were project bonds or asset-backed securities.

The majority (54%) of issuers in 2015 were located in North America. 37% were located in Europe and 7% were in the Asia-Pacific region.

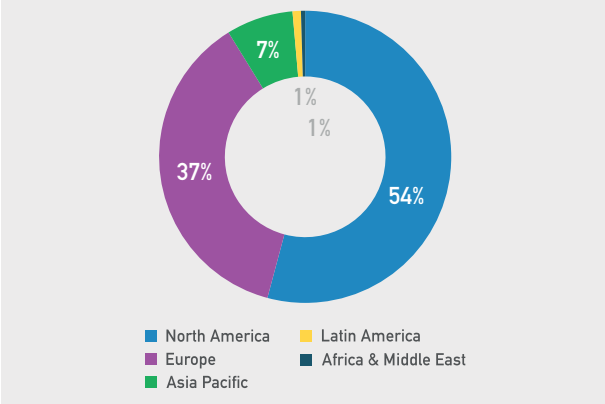
Green bond issuances by issuer type as a percentage of number of deals (2015)



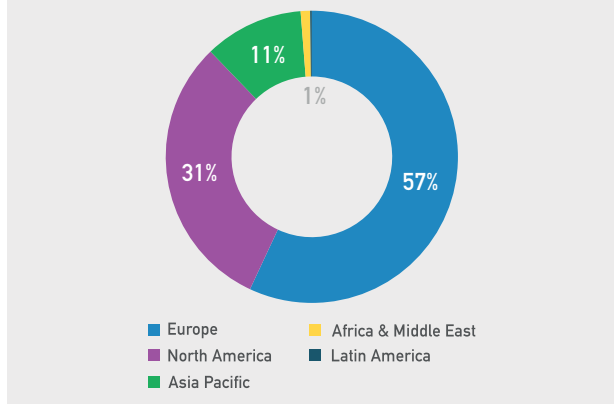
Green bond issuances by issuer type as a percentage of deal value (2015)



Green bond issuances by region as a percentage of number of deals (2015)



Green bond issuances by region as a percentage of deal value (2015)



FREQUENT FLYERS

Of the 138 organisations that issued a green bond in 2015, 21 issued more than once. Thirteen issuers placed two bonds in 2015 and six issued between three and ten. The International Finance Corp issued 23 bonds and The World Bank issued a staggering 32 times (World Bank issuances do not include IFC placements).

Eleven organisations issued more than \$1 billion of green bonds in 2015. These placements totalled \$18.2 billion and accounted for 44% of the total value of green bonds issued in 2015.

A full set of league tables ranking issuers by the number and value of issuances is provided on page 10 of this report. Profiles of the most active issuers can also be found pages 18-42.

Some 95 organisations arranged green bonds in 2015, although only twelve arranged more than ten bonds. Furthermore only three arrangers-JP Morgan, Bank of America Merrill Lynch and Credit Agricole-arranged 30 or more bonds.

A full set of league tables ranking arrangers by the number and value of issuances is provided on page 12 of this report. Profiles of the most active arrangers can also be found pages 72-89.

2016 STARTS WITH A BANG AS CHINESE ISSUANCES IGNITE

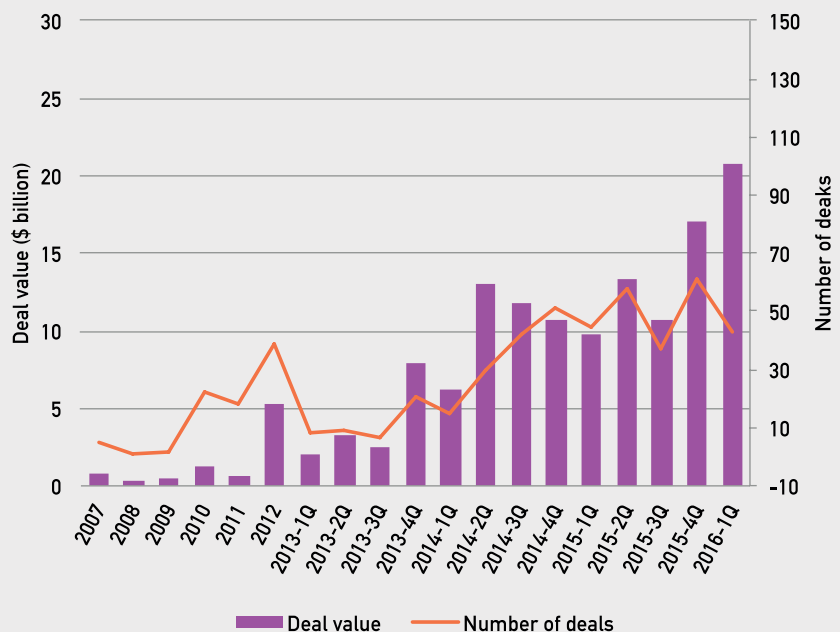
2016 has started at breakneck speed. Some \$22.1 billion of green bonds were issued in 1Q16, more than in any other quarter. The green bond market will hit a record \$88.4 billion this year if issuances continue at this pace.

The significant increase is a direct result of a surge of issuances in China. Chinese organisations issued \$8.5 billion of green bonds in 1Q16, accounting for 38% of all issuances. Chinese organisations only issued \$1.4 billion in 2015 and \$478 million in 2014.

Notably a quarter of the value of issuances in 1Q16 were by one organisation, Shanghai Pudong Development Bank. The bank issued a CNY20 billion (\$3 billion) green bond in January and a CNY15 billion (\$2.3 billion) green bond in March. The second most notable Chinese issuer was China Industrial Bank, which raised CNY10 billion (\$1.5 billion) in January.

Why have issuances ignited in China? The main reason is that the Chinese government has implemented a legal framework that allows organisations to issue green bonds. A green bond pilot was also launched on the Shanghai Stock Exchange. These initiatives stem from the country's five-year plan which includes measures to expand the green bond market. Mr Ma Jun, a leading economist at the Research Bureau of the People's Bank of China estimates that Chinese green bonds issuances will total a staggering CNY300 billion (\$46 billion) in 2016.

GREEN BOND ISSUANCES (2007 - 1Q16)



WEIGHING UP THE COSTS AND BENEFITS

Why have issuances ignited? It's not, as some may think, because green bonds represent a cheaper source of debt than conventional bonds. Indeed nearly every issuer and arranger interviewed for this report stated no such premium currently exists.

If anything, issuing green bonds comes at a monetary price due to the costs associated with reporting and in some cases securing a second party opinion. For large multilateral finance organisations this cost is almost negligible due to their existing reporting requirements. But for some issuers the additional reporting costs are a real obstacle.

"Potential issuers can be hesitant to absorb the additional transaction costs associated with pre-issuance and post-issuance reporting," explained Vikram Puppala, Associate Director, Advisory Services at Sustainalytics. "We try to educate people that the initial cost is not that significant compared with the benefits of issuing a green bond. Most issuers are able to absorb these costs. If you

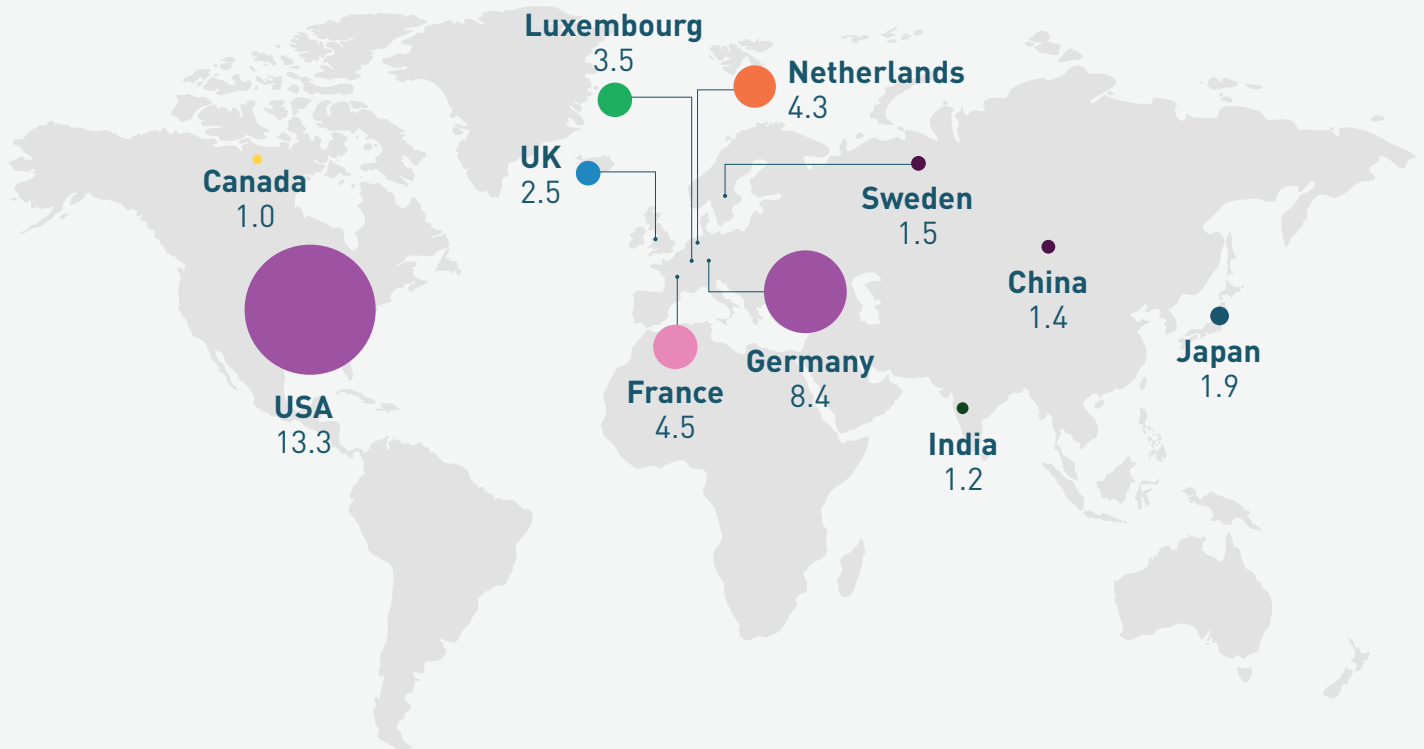
are a multilateral development bank you will already have good reporting systems. But other issuers don't have the internal tracking capabilities which creates a transaction cost. It is definitely a hurdle to overcome."

Despite the absence of a green bond premium issuances have surged for two main reasons—it helps organisations meet their sustainability and environmental objectives and it also attracts a much wider range of investors beyond those that might invest in a non-green bond.

That's not to say that a green bond premium won't materialise in the future. Indeed a number of market participants interviewed for this report stated that there is no green bond premium at the moment simply because yields are generally so low. Indeed a large number of green bonds issued in the last 18 months have been oversubscribed by many orders of magnitude. This indicates there might be scope for a pricing premium once yields rise generally.

"There has been some reported commentary that investor diversification from green bonds has resulted in a pricing

GREEN BOND DEALS PER COUNTRY IN 2015 (\$BILLION)



advantage, but at the moment I don't think there is enough data to support a clear advantage on the pricing side," explained Kevin Smith, Vice President, Environmental Markets Group at Goldman Sachs. "That being said, many believe it's a future benefit which the market will get to over time."

RISE OF THE SPOS

Issuing green bonds is attractive partly because it enables organisations to demonstrate their Environmental, Social and Governance credentials. An increasingly popular way of doing this is to appoint a second party opinion (SPO) provider to validate just how 'green' a green bond is. This is not just being driven by the issuers, but also the investors in green bonds.

According to deals tracked by Clean Energy Pipeline, 100 of the 216 green bonds issued in 2015 had a SPO rating. The majority (66%) of SPO ratings were provided by CICERO. A league table ranking SPO providers by the number and value of issuances can be found on page 10 of this report.

"SPOs have increased to the point that now over 50% of green bond issuances have gained SPOs in the past three years," confirmed Martina Macpherson Managing Partner, SI Partners – oekom research UK. "In 2013, before the corporate issuers entered the market, only a very small fraction of SPOs were undertaken. There is a debate at the minute as to whether issuers should be forced to gain an SPO when issuing, in particular if they aim to get their green bond listed. However, due to the multitude of different green bond taxonomies and standards, challenges and confusion around defining 'green' remain in place."

That said, some investors believe SPOs are merely a starting point in assessing the credentials of a green bond. "We look at SPOs but they are not enough for us," explained Olivier Vietti, Fixed Income Fund Manager at AXA Investment Management. "Someone at the EIB said they employ 200 people to analyse and report on green bonds. I question the capacity of the SPOs because what they have to cover is so large. So it is good to get an SPO it but it is not enough."