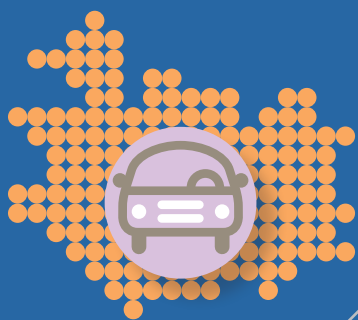


THE GREEN BOND MARKET IN THE NORDICS 2018



**A USD 19bn
Nordic Green
Bond Market**

Climate Bonds INITIATIVE

Handelsbanken

Prepared by the Climate Bonds Initiative

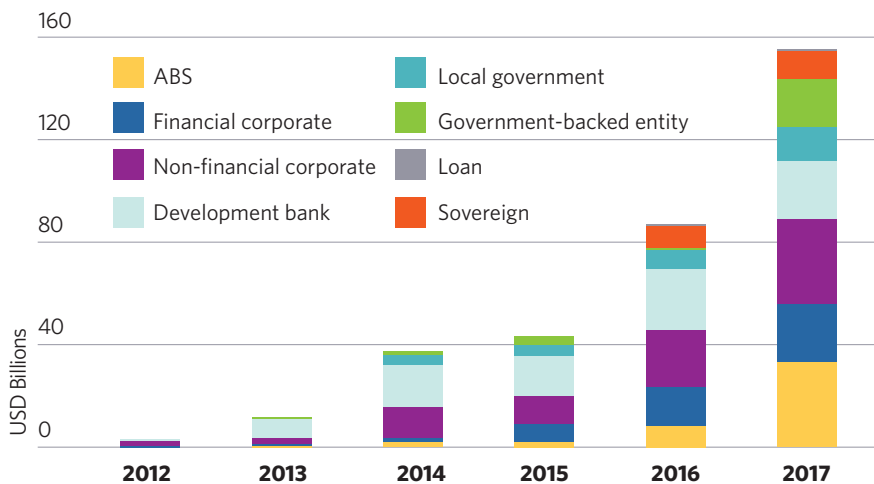
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Global Market Snapshot

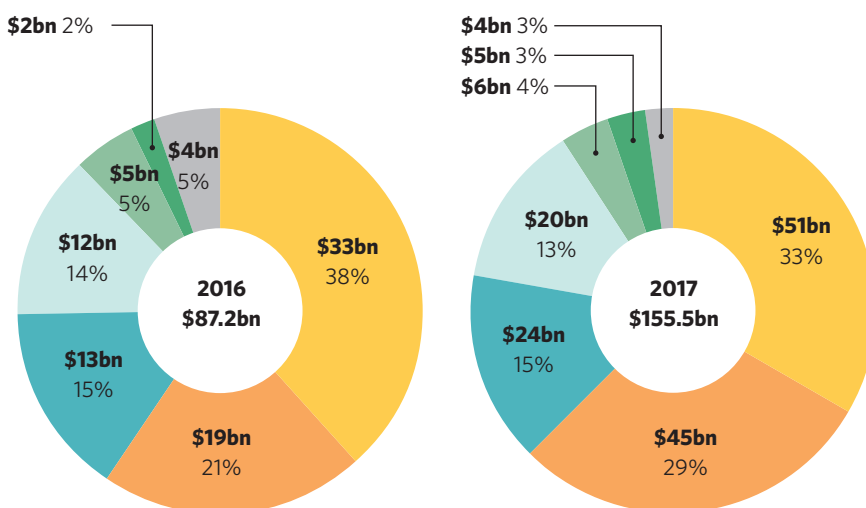
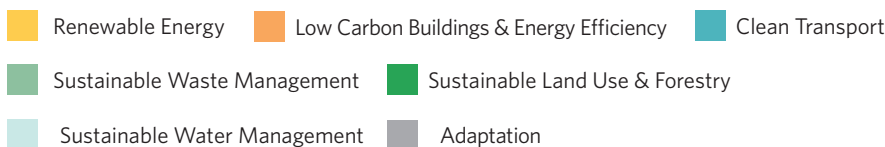
The labelled green bond market has been growing in leaps and bounds, roughly doubling in size in 2016 and 2017.

While 2017 was a positive year, for global finance and its actors to be making a substantial impact on climate targets, we estimate that the green bond market needs to reach USD1tn by 2020¹.

The labelled Green Bond market is growing rapidly



Renewable Energy going strong but Low Carbon Buildings/Energy Efficiency post record growth



Our forecast for 2018 is USD250-300bn

Key trends to watch include increased sovereign and sub-sovereign issuance across the world, progress on common international standards and definitions, pressure on the banking sector to embrace green lending and increased linkages between green bonds, green finance and Sustainable Development Goals² 6, 7, 9, 11, 13 and 15.

Understanding green and climate bonds

Green bonds

Green bonds are issued in order to raise finance for climate change solutions. They can be issued by governments, banks, municipalities or corporations. The green bond label can be applied to any bond format, including private placement, securitisation, covered bond, sukuk and others. The key is for the proceeds to be applied to "green" assets.

Green definitions

The concept of being *green* differs around the world. At the Climate Bonds Initiative, we approve green bonds according to a sectoral taxonomy.

Issuers can also certify their issuance according to the Climate Bonds Standards. The stringent verification process ensures that the use of proceeds comply with the objective of capping global warming at 2°C.

Inclusion in the Climate Bonds Initiative's database

Only bonds with at least 95% of proceeds dedicated to green projects that are aligned with the Climate Bonds taxonomy are included in our figures. For example, sustainability bonds with a wider use of proceeds or bonds which fund large amounts of working capital would be excluded.

If issuers do not provide sufficient information on the use of proceeds, the bonds are tagged as "pending". If and when satisfactory additional information becomes available, the Climate Bonds Initiative may include them in its database of labelled bonds.

Abbreviations used in the report:

LGFA - Local government funding agency

GBE - Government-backed entity. This includes municipally owned companies and state-owned enterprises. LGFAs are GBEs.

Nordics at the forefront of sustainability

Government focus on sustainability

The Nordic countries lead by example.

The Nordic Model of governance and public service delivery is all about sustainability and social cohesion. On the environmental side, 2009 was an important year:

- The Swedish Association of Local Authorities and Regions issued a position paper outlining their priorities for energy and climate policy.
- The Norwegian government implemented guidelines for addressing climate change at the local government level through an amendment to The Planning and Building Act.

From 2010, Norwegian municipalities and counties have been required to draw up energy and climate plans as part of their annual budgets. More recently, Norway adopted the 2017 building code which features even more stringent energy efficiency requirements for all building types and renovations.

In December, the Finnish Ministry of the Environment published a guide for low carbon public buildings and life cycle analysis, featuring measures to support sustainable construction³. On 1 January 2018, Sweden's Climate Act⁴ came into force. The focus on sustainability is pervasive.

Investor support

In another notable development, in November 2017, Norway's USD1tn sovereign wealth fund announced its intention to divest fossil fuel investments. The news reverberated across the asset management community as a rallying call to re-assess portfolios and align to the climate imperative. In a similar vein, earlier in the year, Swedish pension fund AP7 sold its investments in six energy companies it said violate the Paris climate agreement.

More broadly, pension funds from the region have largely integrated the sustainability agenda in their investment strategies. Most are now focusing on engagement and supporting the transition to a low carbon economy.

Proactive and engaged green bond issuers

Nordic issuers embraced the green bond market when it was still in its infancy. The Nordic Investment Bank, a multilateral institution owned by the Nordic and Baltic states, and Norwegian state bank KBN Kommunalbanken started issuing green bonds in 2010. The first corporate green bond and the first City bond were both issued in Sweden in 2013. In 2016, property company Fabege (Sweden) was the first to create and label a bespoke Green MTN corporate bond program.

The Nordics account for 6.7% of global issuance, including the supranational Nordic Investment Bank, and 18.5% of European issuance. Sweden is the sixth largest source of labelled green bond issuance; Norway, Denmark and Finland⁵ are in the Top 20, but Iceland has yet to record a green bond issue.





By and large, the story of the Nordic green bond market is about many small and many repeat issuers creating a big impact. The Nordic Investment Bank and Nordic Local Government Funding Agencies (LGFAs) have added significantly to issue volumes. The reality is, that even if not labelled, banks in the region fund many sustainable assets via loans. Bank issuance and/or green loan labelling can help showcase this.

Promoting market integrity

Nordic players are also at the forefront in promoting market integrity: demonstrating best practice in external reviews, pushing investor standards and leading the international dialogue.

This is our first report to focus on the Nordic market, covering Denmark, Finland, Iceland, Norway and Sweden. The report was commissioned by Handelsbanken.

Overview of the Nordic green bond market

Country	Global ranking, excluding supranational	Amount issued (Outstanding)	Issuers	Inaugural issuer Date of issuance	Largest issuer (Issued, bonds)	% green bonds with external review
 Sweden	6th	EUR10.2bn (EUR9.7bn)	36	City of Gothenburg October 2013	Kommuninvest (EUR1.5bn, 3)	>99%
 Norway	16th	EUR2.7bn (EUR2.2bn)	11	Kommunalbanken May 2010	Kommunalbanken (EUR1.6bn, 13) ⁶	95%
 Denmark	17th	EUR2.3bn (EUR2.3bn)	4	Vestas March 2015	Ørsted (EUR1.3bn, 2)	100%
 Finland	20th	EUR1.0bn (EUR1.01bn)	2	MuniFin October 2016	MuniFin (EUR0.9bn, 3)	100%

Nordic issues may be often small but ...
 Nordic institutions have made BIG contributions to the green bond market

Nordic green bond issuance has recorded many global and European firsts. With its 2010 debut green bond, state-owned municipality funding agency KBN Kommunalbanken became one of the pioneers in green bond issuance. The City of Gothenburg made history in 2013 when it became the first city issuer globally and has become a posterchild issuer for C40 cities engaged in sustainable urban development.

Global green bond firsts by Nordic issuers

Sector in which first	Green bond Issuer	Issuer domicile	First issue date	Size
European state-owned Bank	KBN Kommunalbanken AS	Norway	May-2010	two bonds in AUD and ZAR totalling EUR 85m
City	City of Gothenburg	Sweden	Oct-2013	SEK 500m (EUR 57m)
Corporate & Real Estate	Vasakronan AB	Sweden	Nov-2013	SEK 1.3bn (EUR 145m)
Forestry & Paper	Svenska Cellulosa AB	Sweden	Mar-2014	SEK 1.5bn (EUR 170m)
Wind Energy	Arise AB	Sweden	Apr-2014	SEK 1.1bn (EUR 121m)
Municipal Housing	Fastighets AB Förvaltaren	Sweden	Oct-2014	SEK 400m (EUR 43m)
European Municipal Energy	BKK AS	Norway	Oct-2014	NOK 1.1bn (EUR 131m)
Green MTN program	Fabege	Sweden	May-2016	SEK 600m (EUR 64m)

A notable runner-up is the Nordic Investment Bank, headquartered in Finland.

It entered the then nascent green bond market in February 2010 as the second European supranational bank after the European Investment Bank. It has since issued a total of EUR3bn in 16 issues.

LGFA's are also repeat issuers: three of the financial institutions with a specific mandate to provide funding to the public sector, namely KBN Kommunalbanken (Norway), Kommuninvest i Sverige (Sweden) and Municipality Finance (Finland). Together with KommuneKredit (Denmark), which issued its debut green bond in June 2017, these specialist lenders account for EUR4.5bn of green bond issuance to date or 23% of the Nordics total of EUR19.2bn. We expect to see continued issuance from LGFAs.

Local governments issue green bonds directly, notwithstanding the aggregation

benefits offered by LGFAs. In fact, Swedish local government deals totalling EUR2.3bn account for 41% of European local government green bond issuance, ranking it second after France.

The City of Gothenburg and Stockholms Läns Landsting have issued 13 green bonds between them, raising EUR1.3bn. Promisingly, the number of issuers keeps growing with clear prospects for repeat issuance, including internationally for the larger cities and municipalities. For instance, Swedish local government issuers have green bonds quoted on the London Stock Exchange's Green Bond List.

Another sector with prolific issuance is Low Carbon Buildings. As of year-end 2017, Vasakronan had placed 23 bonds totalling SEK11.4bn (EUR1.2bn). SFF – a funding platform for five related property companies – and one of its five owners, Fabege, have raised SEK8.3bn (EUR864m) from 21

green bonds. Housing company Rikshem has issued 10 bonds totalling SEK2.75bn (EUR289m). SBAB, a government-owned property lender, has also tapped the green bond market four times. A constant stream of new entrants and repeat issuance has propelled Sweden to third spot globally in the Low Carbon Buildings/Energy Efficiency sector, after the USA and France.

The Fabege Green MTN also introduced risk factors to the bond documentation to specifically highlight risks associated with climate change, building certification requirements and non-compliance with the provisions of their Green Bond Framework. These risk factors have been emulated in documentation by subsequent EMTN bond issuers. Standardisation of provisions across programs is key to investor understanding and acceptance of green bonds.

A full list of Nordic green bond issuers is provided in the Appendix.

Firsts, which aid green bond market growth, transparency and integrity

2015: Oslo Børs and Nasdaq Stockholm were the first stock exchanges to launch a green or sustainable bonds list.

2017: Local government issuers were the first to publish a multi-national public sector guide for Green Bond Impact Reporting.⁷

Throughout this report deal sizes are provided in the bond's denomination currency and EUR. Totals are in EUR. Currencies are converted to EUR at the Reuters rate on the 15th of the month of issue, or the closest business day.

Nordic contributions to green bond market development

Use of external reviews

- When the World Bank issued its first green bond in 2008, it was also the first to use a green bond external review. This was provided by Oslo-based CICERO.
- Nordic issuers are leaders in the use of external reviews. Practically all outstanding bonds benefit from a second party opinion (SPO) which confirms compliance with ICMA's Green Bond Principles and reviews the climate credentials of proposed investments. Only a handful of NIB's early issues prior to September 2014 do not.
- External review has gained in acceptance over the years. In 2017, 75% of global issuance received an external review. As an SPO provider, CICERO has been at the forefront in providing reviews and developing new methodology.

Best practice for green property bonds

In 2013 Vasakronan made history as the first corporate and the first real estate company to debut on the green bond market. It is the second largest green bond issuer in Sweden after LGFA Kommuninvest.

- More broadly, Swedish property companies have helped to push best practice by using high standards in LEED certification, providing a benchmark for other issuers.
- Sweden leads by example and en masse: a constant stream of new entrants and repeat issuers has propelled the country to third spot globally in the Low Carbon Buildings sector after the USA and France. The US leads thanks to multiple issues from agency Fannie Mae as well as bonds from universities, municipal housing, healthcare and for energy efficiency ABS.

See Financing Low Carbon Buildings, page 14.

Green bond impact reporting

In October 2017, Nordic public sector issuers⁸ published a Position Paper on Green Bond Impact Reporting. It is intended as a practical guide for public sector green bond issuers and is informed by the IFI Harmonized Framework for Impact Reporting⁹.

Contributing to market's foundation

When the World Bank developed the Green Bond¹⁰ concept in 2007/08 as *"an investment vehicle that integrates the fiduciary element of Fixed Income products with climate mitigation and adaptation awareness, giving mainstream investors access to climate-related investment opportunities"*¹¹, one of the key players in making this happen was Nordic bank SEB as lead underwriter on the initial deal. SEB has played an important role in the region and globally.

Poster child for city green bonds

Not only was the City of Gothenburg the first city issuer worldwide, it remains a prolific one. It provided early examples of the scope and range of projects that can be financed by local governments, paving the way for USA municipal issuers.

Swedish city and municipal bonds account for 41% of European local government issuance: no mean feat given Sweden's relative size!

See Public Sector Issuance, page 11.

Use of aggregation platforms

Nordic Local Government Funding Agencies have been instrumental in giving cities, municipalities and government-backed entities access to competitive funding rates from bond placements with a wide range of domestic and international investors. LGFAs fund a variety of projects which support their countries' climate priorities.

In the private sector, Sweden's SFF provides a similar example. The issuer is a financing vehicle for five property companies, allowing them access to the bond market even for smaller ticket sizes. SFF is a repeat green bond issuer.

See Financial Institutions Issuance, page 12.

Stock exchanges

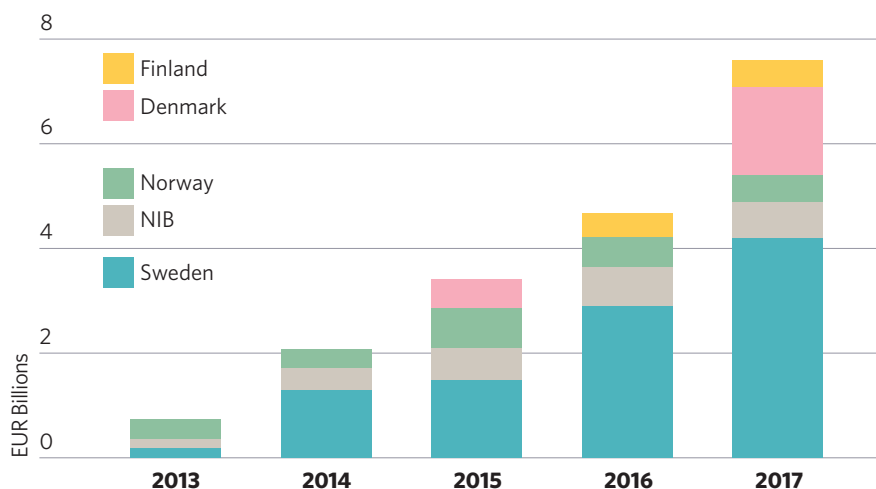
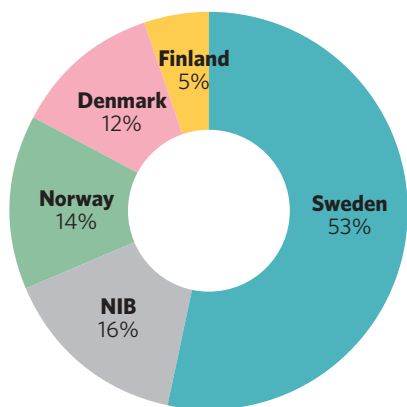
In January 2015, Oslo Børs became the first stock exchange in the world with a separate list for green bonds. In June 2015, Nasdaq Stockholm launched a sustainable bond segment.

Nasdaq First North Bond Market, an alternative marketplace which offers issuers more flexible admission requirements than the Regulated Markets, is well suited for smaller issuers, private placements and retail bonds. This enhances market access.

We hope to see green bond segments launched in Finland and Denmark, as well as on Nasdaq First North.

Market evolution

Sweden dominates overall but Denmark grew the most in 2017



Until 2013, issuance was dominated by the Nordic Investment Bank, a multilateral bank owned by Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway and Sweden, and state-owned bank KBN Kommunalbanken (Norway).

In 2013, the City of Gothenburg and Swedish corporates entered the market and have not looked back. Neither have local government funding agencies which followed KBN's lead.

There has been a steady growth in the Nordic green bond markets since 2014. 2017 was another record-breaking year with issuance 64% higher than in 2016 and 10.5 times the 2013 total.

NIB is the biggest issuer in the region with EUR3bn of green bonds issued as of year-end 2017. The bank funds the public and private sector in the Nordics and Baltics. Country statistics throughout this report exclude supranational NIB.



Sweden has dominated the green bond regional country rankings since 2014. It retains its top spot for yet another year, a position in line with the relative size of its overall bond market.

Among the Nordic countries Sweden has the largest corporate bond market and by far the largest local government market.

Repeat green bond issuers are also active vanilla bond issuers. As green bonds represent only a small part of their overall issuance, there is further green bond market growth potential.



In 2017, Denmark pulled ahead in the green bond rankings significantly when Ørsted (previously DONG Energy) issued EUR1.25bn in November to fund wind energy investments. The green bond represents 20% of the company's outstanding bonds. It marks a new chapter in the newly listed and rebranded entity's evolution as it establishes itself as a renewable energy and grid company.

Denmark's bond market ranks second after Sweden, for corporate and sovereign issuers, but has very little municipal issuance. It remains to be seen if green bond issuance will dovetail with the size of its bond market.

Ørsted is providing impetus in the corporate space. KommuneKredit's debut in the green bond market is also highly significant as the LGFA provides 98% of funding to the Danish public sector, and is in prime position to channel their funding needs.



Among Nordic countries, Norway took the first step in 2010, but has seen muted green bond issuance in recent years. Issuance from KBN also declined in 2017.

The local vanilla bond market is dominated by mortgage companies. Municipalities and cities are also active domestic issuers. This is not yet feeding through in the green bond

market. There has been but one green bond issue from local government: the City of Oslo.

Also absent from the green bond roster are vanilla bond issuers such as large energy companies and NSB, the railway operator.



Finland saw its first green bond issuance only in 2016. MuniFin's bond, listed on the London Stock Exchange, was followed by two more bonds from the LGFA in 2017.

The only other green bond issuer so far is Fingrid, which debuted in 2017. The deal will fund the connection of renewable energy generation to the grid and grid efficiency improvements.

FSC forestry, banking, property, cities have all yet to issue green bonds.



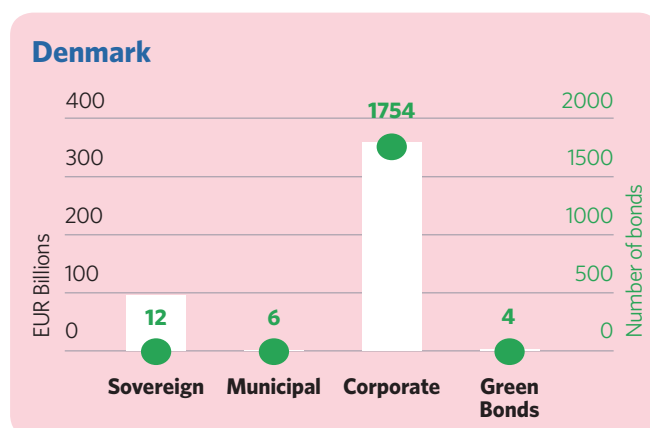
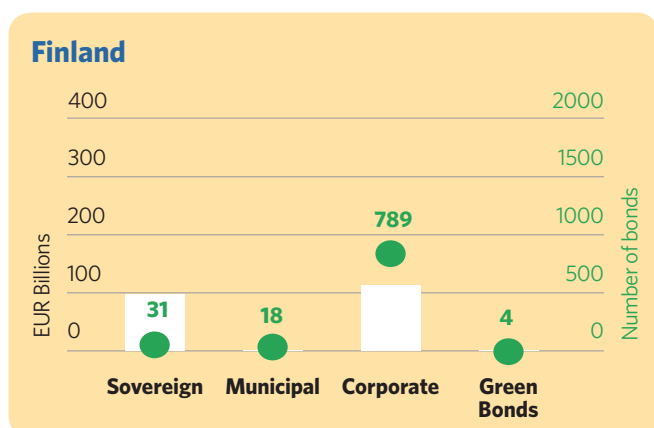
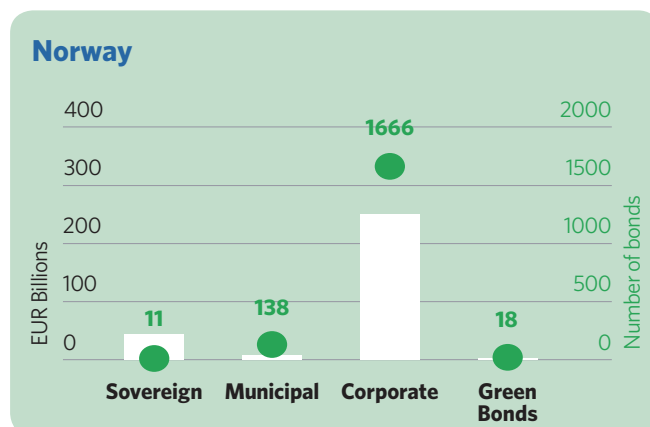
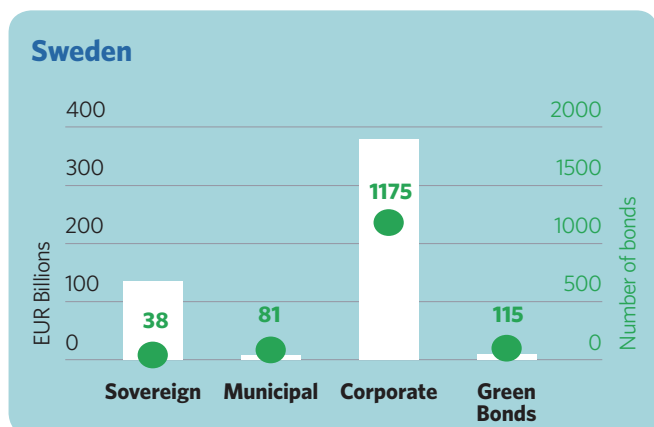
Iceland has not issued a green bond yet.

Corporate bond issuance is dominant in Iceland. The largest issuer is the Housing Finance Fund, which issues domestically. The national power company, Landsvirkjun, issues primarily internationally and is a green bond candidate for geothermal power. Municipality Credit Iceland, an LGFA, has issued five bonds and is well placed as an aggregator to become a green bond issuer.

Growth to date is great, but there is still plenty of headroom: green bond issuance remains a small part of each country's bond market, both in terms of number of bonds and issuance volume.

Plenty of growth potential for green bonds across the Nordics

□ Outstanding Amount (LHS) ● Outstanding Bonds (RHS)



Source - bond issuance: cbonds.com, as of 4 January 2018. Corporate and Municipal adjusted down to account for Green bonds tally.
Source - green bonds: Climate Bond Initiative, as of 31 December 2017

2018 has started off well. First out are the 24th green bond from Swedish property company Vasakronan and yet another Nordic first: the first residential green covered bond. The EUR1bn deal from Norway's SpareBank 1 Boligkreditt has the potential to spur similar issuance from the multitude of mortgage banks and covered bond issuers in the region.

These deals are not reflected in report statistics as they occurred after the year-end cut-off date. However, they are both significant in their own right. Vasakronan's bond reflects continued appetite from repeat issuers. The Norwegian bond could well turn out to be the harbinger for increased issuance from Norway.

Investors

As the saying goes, it takes two to tango! Investors who subscribe to the Socially Responsible Investment agenda, have been active buyers of green bonds and the number of dedicated green bond funds keeps increasing.

Examples of green bond funds from the region include SEB's Green Bond Fund, which launched in early 2015, and SPP's Green Bond Fund, which had SEK3bn (EUR300m) assets under management when SPP/Storebrand (Norway),¹² committed to the Green Bond Principles in September 2017 in support of transparency and market integrity.¹³

This process of embedding green bonds into investment strategies is backed by large pension funds who select fund managers

that share their sustainability views. Institutional investors from the Nordic region have achieved this by investing in green bond funds, asking asset managers to create bespoke SRI portfolios for them, integrating climate-friendly screening criteria in their general investment decision-making and supporting companies that do business sustainably.

An example of integrating criteria is provided by Öhman Fonder, a Swedish fund management and discretionary portfolio management firm, which has partnered up with Sustainalytics for in-depth research and sustainability ratings to inform their investment decisions.

Issuer sectors and new issuers in 2017

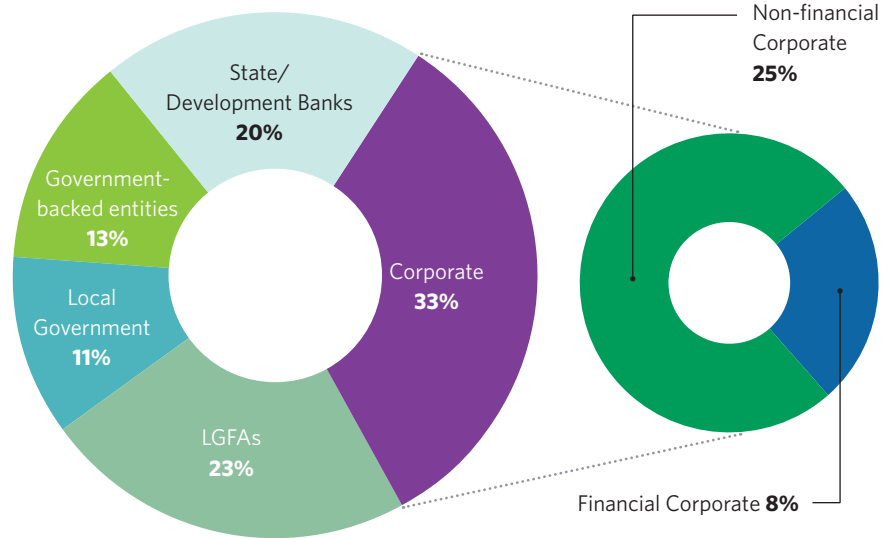
There were 15 new green bond issuers in 2017. Swedish property company Atrium Ljungberg has even become a repeat issuer over the course of the year. As the market has grown, so has the range of issuer sectors. Financial institutions - state banks, LGFAs, NIB and commercial banks - account for 51% of total issuance to date. Other big sectors are property and municipal housing, clean energy and local government.

LGFAs, local government and government-backed entities account for 47% of Nordic green bond issuance and over 40% of their bonds, by value, were issued last year. NIB, state-owned SBAB (Sweden) and Swedish Export Credit account for a further 20% of issuance. The private sector accounts for a third of green bond issuance to date.

At a third of issuance, the private sector is relatively small and there is certainly room for growth, particularly for financial institutions. Issuance from banks can act as a catalyst, because banks aggregate issuance from smaller borrowers, for whom direct access to the bond market may be economically inefficient.

Sectors where we see potential for green bond issuance include property, forestry & paper industry, rail transport, water and wastewater treatment, as well as certain renewable energy sectors such as hydropower, biomass/biogas and electricity grids.

Government related issuers account for two-thirds of Nordic issuance

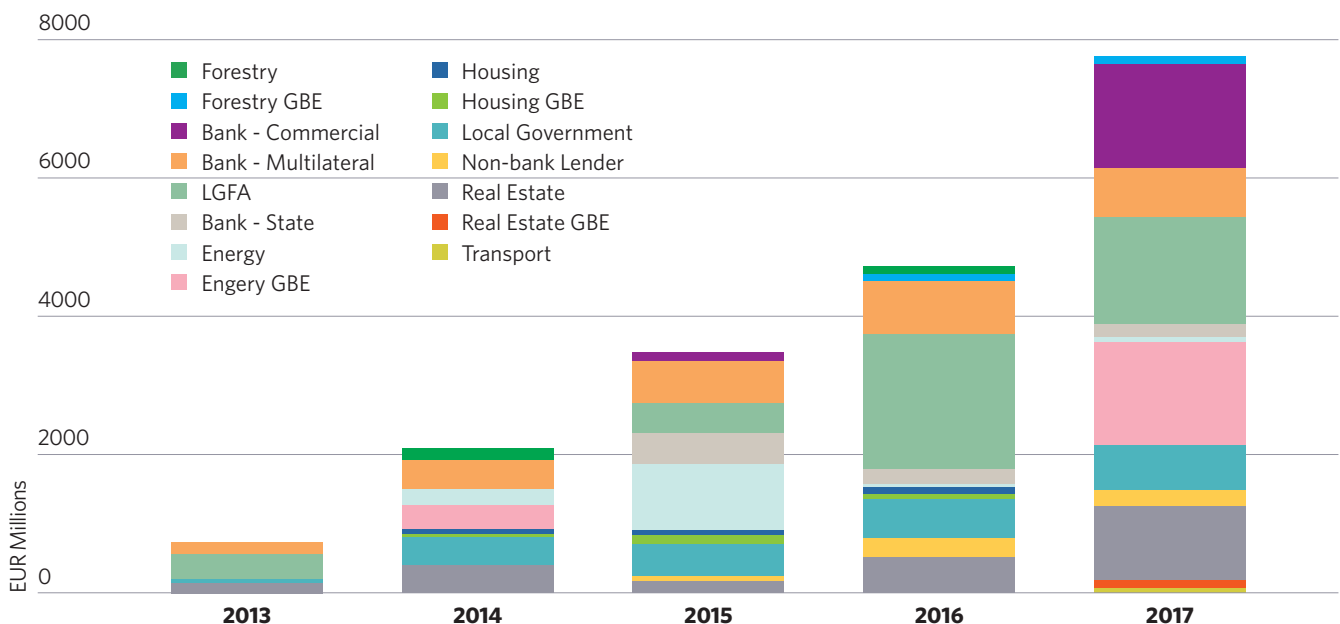


New Issuers in 2017

	Sweden	Norway	Denmark	Finland
New Issuers	9	3	2	1
Sectors	3 banks	2 energy*	1 LGFA	1 energy
	3 property	1 property	1 energy	
	2 local government*			
	1 transport			
Issue volume	EUR 2,286m	EUR 256m	EUR 1,750m	EUR 1,750m

* Plus one pending

The Nordics feature a highly diversified issuer universe



Green Bond Deal Features

Deal size

The largest placement to date is Ørsted's EUR1.25bn deal, issued in two tranches. The smallest is a EUR2m bond issued in BRL by NIB in February 2017.

Banks have typically gone for benchmark deals of 500m EUR or USD, except for some KBN and NIB issues. The 20 bonds of USD500m or more account for EUR9.7bn or 51% of total issuance. Listing venues include the London Stock Exchange, the Luxembourg Green Exchange and German exchanges.

The average deal size for the remaining 158 bonds is EUR60m. Deals of this size are not that well suited to international issuance and tend to be listed locally and in local currency.

However, this is not always the case. For example, Swedish local government issuance and Fingrid's EUR100m green bond are well below benchmark size. Yet the strength of the issuers – sub-sovereigns respectively state-owned enterprise – and, perhaps more importantly, their strategy to access international investors and a wider socially responsible investor base has seen City of Gothenburg, City of Malmö, Stockholms Läns Landsting and Fingrid list on the London Stock Exchange.

Bond currency

At 28% of outstanding amount, EUR denominated green bonds are popular among Nordic issuers. However, there are local differences: e.g. in Sweden, issuers rarely issue in anything other than local currency so SEK bonds account for 45% of the outstanding Nordics total.

US dollars round off the popular denomination currencies. Historically, KBN has issued in a wider range of currencies. MuniFin's private placement was issued in Australian dollars. In general, LGFAs have long sought diversification in their bond investor base and have issued in currencies to match.

Bond tenor

High volumes of Swedish issuance also influence tenor distribution. The volume weighted average tenor for Sweden is 4.5 years, whereas for Norway it is 6.3 years and for Finland 7.7 years. Ørsted's 12- and 1,000-year bonds increase Danish and overall averages. All-in-all, the most common tenors are in the 3-5 year range.

Ørsted's 1,000-year bond is effectively a perpetuity: it is issued with an extremely

long term because of a Danish bond market convention that does not permit perpetuities. However, its 12-year bond also extends the maturity curve for corporate green bonds. Only KBN, an LGFA, and NIB, a supranational, have issued longer dated bonds at 15 and 20 year tenors. Long-dated bonds are key for local government and corporates in funding long-term green infrastructure.

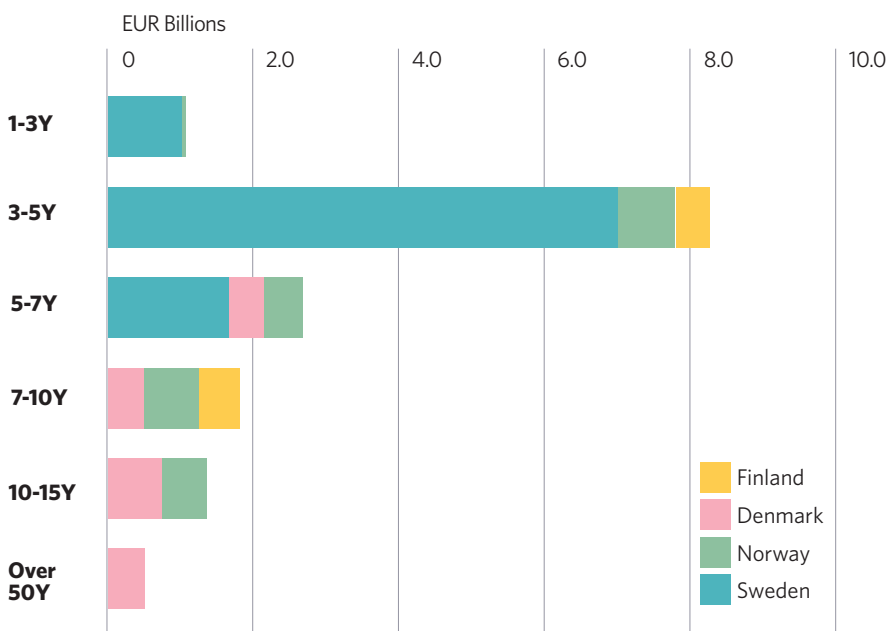
Type of instruments

Globally, the range of green instruments has become increasingly extensive. Nordic issuers, however, have used a more limited number of bond structures. Municipality

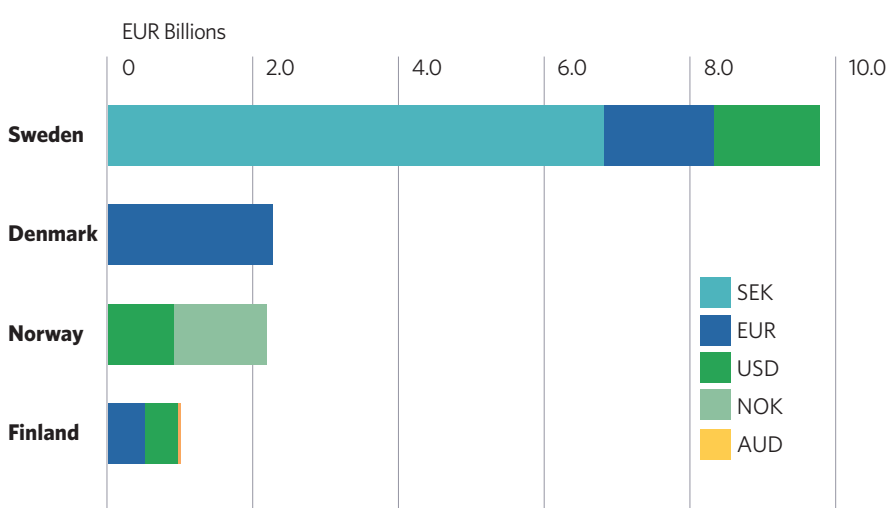
Finance is, to date, the only Nordic issuer to have raised green debt through a private placement, for instance.

There is a diversification opportunity. A prime example are green covered bonds given the dominance of mortgage backed bonds in local bond markets. The first green covered bond only came to market in January 2018: SpareBank 1 Boligkredit's dual recourse bond links to a pool of mortgages secured on energy efficient residential housing. More banks are expected to follow suit. Mortgage backed securities may be an option, too.

SEK issuance dominates for outstanding green bonds



Tenors of 3-5 years dominate among outstanding green bonds



Use of proceeds

For some issuers, the allocation of bond proceeds is aligned to the issuer's business sector: e.g. transport in the case of Volvofinans, which debuted in 2017 with a SEK700m green bond (EUR72m). It is the only issuer from the transport sector, but low carbon transport is also financed by banks and local government, i.e. indirectly. The direct and indirect allocations to sectors are captured in our use of proceeds analysis.

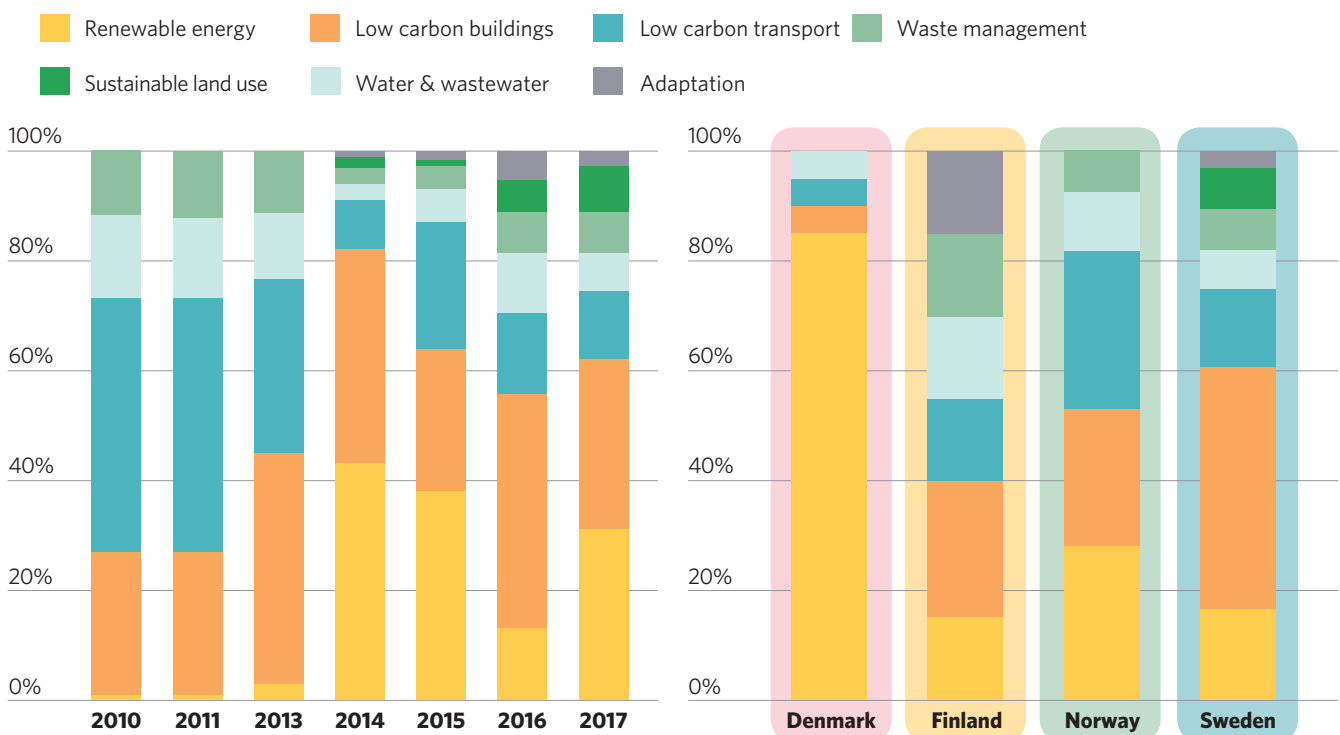
Diversity in the use of proceeds has increased over time, in line with the global

trend. However, property funding is much more heavily represented due to strong issuance in Sweden. In 2013 nearly 75% of raised funds were allocated to low carbon buildings and transport. An ever-increasing number of commercial real estate and housing company green bond issuers means investment in energy efficient property remains high on the agenda: 31% in 2017, 34% overall to date. Renewable energy allocations - 28% overall, 31% in 2017 - benefit from the emergence of district

heating companies in Norway and Sweden as green bond issuers, as well as the more typical solar (e.g. Scatec, Norway) and wind energy (e.g. Ørsted and Vestas, Denmark).

The highest diversity of funded sectors is observed in Sweden, the largest market with a mix of public and private sector issuers. At the other end of the spectrum, Danish issuance is dominated by the EUR1.25bn Ørsted deal.

Low Carbon Buildings and Renewable Energy dominate Use of Proceeds



Note: Overall issuance does not include supranational NIB

External reviews and reporting

Nordic countries were early adopters of external reviews and over 98% of outstanding bonds benefit from a second party opinion (SPO). The exceptions relate to NIB bonds issued prior to Q3 2014.

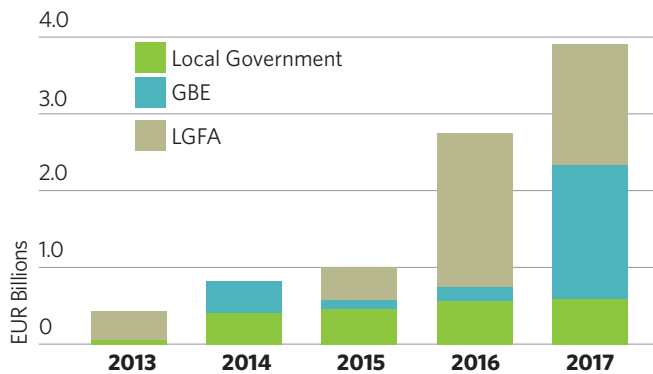
CICERO is the dominant reviewer for Nordic issuance and, by value, has provided over 80% of external reviews including for NIB and government-backed entities. DNV GL is the second largest reviewer (10%). Sustainalytics has a smaller share but is gaining ground with Swedish municipal, MOC and SOE issuers. Oekom debuted in the Nordics with an SPO for Nordea's first green bond placed in June 2017.

In our study published in June 2017, *Post Issuance Reporting in the Green Bond Market-Trends & Best Practice*, we highlighted best practice examples from public sector issuers, Kommuninvest (Sweden) being one of them. For instance, its reporting shows how much it has committed to its overall green bond programme, the amount issued to date and what is still outstanding. In terms of cities, Gothenburg got a mention for its reports, which feature charts on how proceeds are allocated across broad projects types as well as a distinction between mitigation, adaptation and general environment projects.

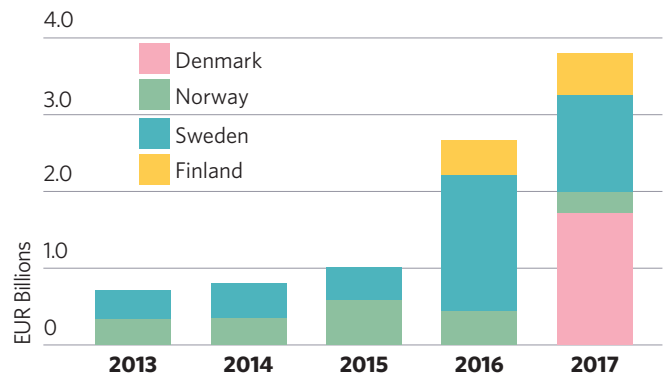
One key Nordic contribution to the development of the green bond market is the publication of a guide⁷ to green bond impact reporting for local government, created and to be implemented by municipalities and financial institutions across the region. Not only is the scale of cooperation impressive, but the speed of putting together the guide - a couple of months - suggests a high degree of alignment of views around climate topics.

Public Sector Issuance

LGFAs dominate public sector issuance¹⁴



Norway was first; Sweden is No. 1 on volume



The Nordic Model – as it has evolved in Denmark, Finland and Sweden – is based on decentralisation and cooperation between regions and municipalities to deliver an extremely wide range of services to the people they serve. A lot of fiscal responsibility rests with local and regional governments. Many services including health care, education, housing, energy generation and heating are managed by local governments but may be delivered by municipally owned companies.

In Norway there is greater state involvement because the government retains taxation powers. In general, state-owned enterprises play a more significant role in Norway and Finland where state ownership is higher.

A high volume of public sector issuance¹⁴ is not surprising against the backdrop of the Nordic Model. Green bonds from issuers in the following categories account for almost half the Nordic green bond issuance:

- Local government – municipalities, cities, counties, regions;

- Government-backed entities – companies which are majority owned by municipalities and/or the state, i.e. municipally owned companies (MOCs) and state-owned enterprises (SOEs);¹⁵ and
- LGFAs – three of the public sector financing institutions are owned by member municipalities, one is state-owned

The 68 bonds the 28 public sector issuers have issued total EUR9bn and account for 47% of Nordic green bond issuance.

LGFAs play a vital role in financing local government and related entities.

In Denmark, KommuneKredit accounts for 98% of public sector borrowing. In Finland, MuniFin accounts for about 60%. In Norway and Sweden, KBN and Kommuninvest provide 45-50% of financing.

However, local government and government-backed companies are increasingly accessing the debt capital market in their own right, particularly in Sweden and Norway.

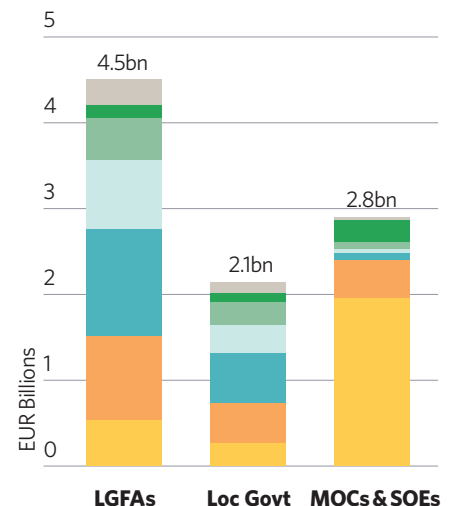
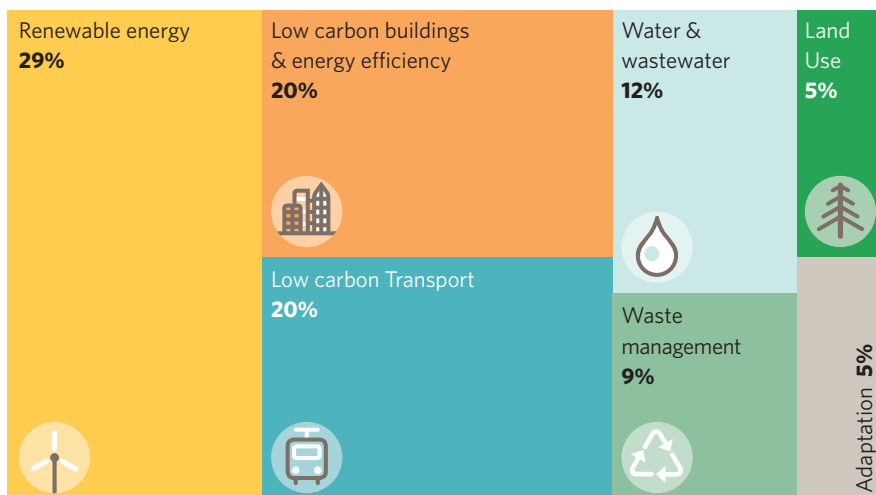
Green bond issuance from the public sector

is being channelled primarily towards renewable energy, low carbon transport, low carbon buildings and energy efficiency. As Denmark and Norway deliver on their plans to upgrade rolling stock and rail transport in general, we would expect an increase in funding for the Low Carbon Transport sector.

Nordic local governments and LGFAs have fairly similar distributions overall. Given their relative size, this drives the sector's use of proceeds profile. However, two thirds of government-backed issuers use bonds to fund renewable energy, with property companies a distant second.

In Norway and Sweden, in particular, there is scope for increased local government issuance given the much wider number of local government vanilla bond issuers and the sustainability obligations incorporated in public-sector budgets. Reykjavik, too, has ambitious plans¹⁶, particularly in rail and other public transport, which lends itself well to green bond financing.

Renewable Energy is top category overall, but particularly for Government-backed Entities





Financial sector issuers include development banks Nordic Investment Bank and Sweden Export Credit, state bank SBAB, a state-owned Swedish specialist property lender, the LGFAs and four commercial banks.

Development banks. NIB was one of the first Nordic green bond issuers. Its 16 green bond issues to date total EUR3bn, making it the largest Nordic issuer. The bank has funded private and public sector entities primarily in the Nordics: 95% for the 2011-2017 period, according to data provided by the bank. Loans for energy efficiency improvements and green buildings account for 30% of allocations, with another 29% going to renewable energy and 24% to wastewater treatment. Public transport and waste management make up the remaining 17%, according to NIB data.¹⁷

Sweden Export Credit provides an example of issuance, which supports international trade and emerging markets development. There are similar institutions in the region that have yet to issue green bonds. They are potential issuers insofar as they fund projects that lend themselves to green financing. These include:



Finland's export credit agency Finnvera and development finance fund Finnfund: both are repeat issuers in the vanilla bond market



In Norway there are three candidates. Export credit agency Eksportkreditt Norge can follow in the footsteps of Swedish Export Credit.

Sustainable development fund Norfund, which, among other things, finances clean energy in developing countries and the Rainforest Fund, which funds programs and investments that protect rainforests may also have suitable programs and/or assets.

Commercial banks. Nordic banks have been active underwriters and promoters of green bonds, but issuance from commercial banks has been limited. Norway's DNB was the first bank to take advantage of the green bond market in early 2015. In 2017 three more large institutions debuted - SEB, Nordea and Swedbank - more than offsetting somewhat lower annual issuance from LGFAs.

DNB raised its bond specifically for a wind project, but the Swedish banks' green bond frameworks feature almost the full range: renewable energy, green buildings/ energy efficiency, low carbon transport, water and waste management and forestry/sustainable land use. Given the dominance of mortgage-backed bonds in local bond markets, however, particularly relevant categories to consider for green bond issuance are:



Raising green funds to offer energy efficiency loan programs to property landlords and multifamily housing landlords, including cities, municipalities and cooperatives.



Mortgage-backed issuance such as covered bonds (like BerlinHyp's green Pfandbrief), mortgage backed securities (like Obvion's Green Storm RMBS) and green bonds with proceeds tagged for energy efficiency residential mortgages (like Barclay's and ABN AMRO's green senior unsecured bonds).

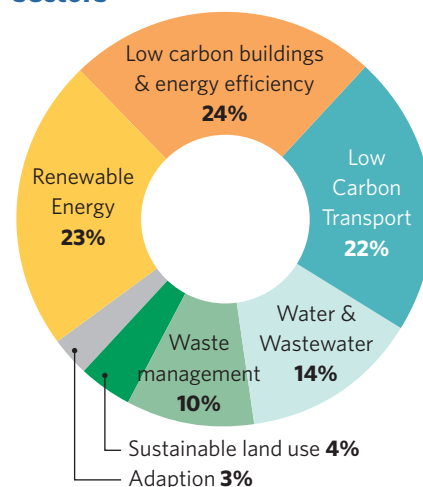
Mortgage banks play a vital role in supporting the housing market and property lending more broadly. They are among the largest bond issuers. In Denmark, mortgage-credit bond issues represented 78% of all bonds outstanding as of 30 September 2017, according to official statistics. In Norway - 41% as of 30 June, and in Sweden - 28% as of 31 October. All are sizeable market segments for bond issuance!



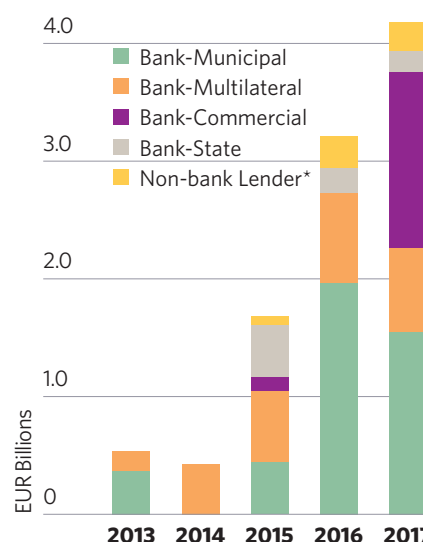
Sweden's property bank SBAB has issued four green bonds, but given the size of the mortgage credit market, this is a drop in the ocean. Even if we add in the recently closed EUR1bn residential green covered bond from SpareBank 1 Boligkreditt (Norway), we are barely scratching the surface of what could be.

Consequently, we expect to see more issuance from SBAB and other big property lenders among commercial banks. But we also suspect we could see deals from SBAB's covered bond subsidiary Swedish Covered Bond Corporation and Stadshypotek AB.

Financial institutions finance all sectors



Most commercial banks debuted in 2017



* Non-bank Lender: SFF (Sweden) is a funding platform for five property companies. It on-lends the bond proceeds to these companies. The vehicle has a SEK12bn secured European Medium Term Note (EMTN) program. Its bonds are secured by loan receivables, and the loans are secured on the property that is being financed. The structure allows for both green and vanilla bond issuance, but recent issues have been almost all green, i.e. secured on low carbon buildings.



Covered bonds from other mortgage banks and subsidiaries are also likely. In Finland, these could come from covered bond issuers such as OP Mortgage Bank (OP Financial Group) or cooperative bank Ålandsbanken. Among LGFAs, a good candidate is KLP Boligkreditt, which is part of KLP group (Norway).

LGFAs enjoy dominant position as lender to local government

	Municipality Finance	KommuneKredit	Kommuninvest	Kommunalbanken	Municipality Credit
Country	Finland	Denmark	Sweden	Norway	Iceland
Established	1989 / 1993	1899	1986	1926	1967
Owner	51% municipalities 31% Keva 18% state	Member municipalities	100% state	Member municipalities	Member municipalities
Guarantee structure	Municipalities on a joint basis via Municipal Guarantee Board	Joint and several liability from local and regional governments	Joint and several liability from local and regional governments	100% state-owned since 2009. Letter of support from owner	Municipalities and State Treasury for MOC & SOE loans
S&P / MDY rating^a	AA+ / Aa1	AAA / Aaa	AAA / Aaa	AAA / Aaa	NR / NR
Market share^b	About 60%	98% (prev. 95%)	48% (prev. 46%)	45% (prev. 50%)	25% in 2012 ^c

Sources: S&P Ratings Direct, Municipality Finance PLC, December 2016. (a) Most recent credit reports from Moody's and S&P. (b) Company annual accounts 2016, except for MuniFin (sourced from S&P report) and MCI (sourced from corporate website). (c) Latest available on corporate website

Local Government Funding Agencies

(LGFAs) are prevalent in the region as a pooled funding model for the public sector. They are well-established institutions set up with a specific mandate to finance municipalities, cities, counties, regions, government-backed companies and agencies.

LGFAs are owned by member municipalities, except for KBN, which is state owned. Municipalities are not required to join, but most have. The ownership structure is similar to credit unions: the owners and the borrowers are the same entities.

The key advantage of LGFAs is aggregation. The LGFA can raise funding in large amounts, including benchmark bond deals, and uses the proceeds to lend to even the smallest of public sector entities. LGFA's sovereign credit ratings and larger deal sizes allow them to achieve good bond pricing and the benefits

are passed on to their member municipalities in the form of attractive loan interest rates.

Although certain LGFAs have seen their market share decline as some public sector entities have started tapping bond markets directly, they remain the most viable funding source for smaller cities, municipalities, municipality- and state-owned companies.

KBN Kommunalbanken, Kommuninvest, MuniFin and KommuneKredit are at the forefront of green bond issuance not just due to volume but also in terms of defining the features of appropriate investment projects and developing best practice.

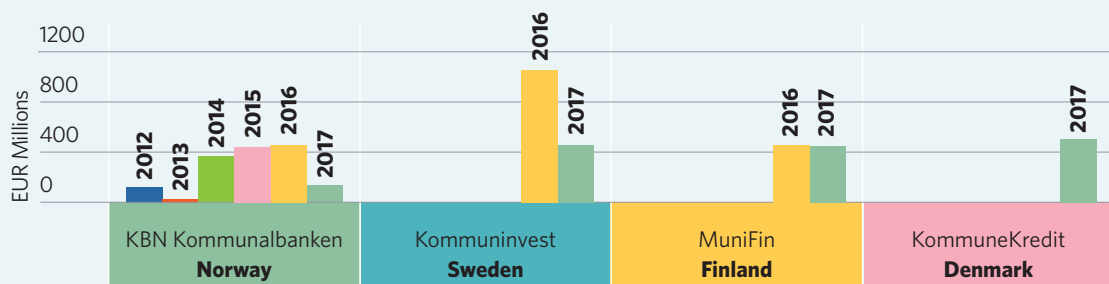
These four LGFAs have issued 20 labelled green bonds altogether. Their outstanding green bonds are generally benchmark size, and are listed on the LSE and/or the Luxembourg Stock Exchange.



However, their green bonds represent only 1.6% to 3.3% of their total bonds outstanding against a backdrop of balance sheets which feature a variety of climate-friendly lending. There is also scope for other LGFAs to enter the market, namely KLP in Norway and MCI in Iceland.

We have high expectations for further green bond issuance from LGFAs – both locally and internationally – as they channel local governments' funding requirements to meet their countries' environmental and climate priorities.

Green bond issuance from municipal banks has high growth potential



Outstanding green bonds					
EURm issued		1034	1511	907	500
Number		4	3	3	1
Green bond share of total bonds outstanding¹⁸		1.6%	3.3%	2.4%	2%

Financing Low Carbon Buildings

Investment in low carbon buildings has been funded largely directly by property companies and by specialised property lender SBAB for a total of EUR3.9bn.

A further EUR1.6bn has been allocated to the sector from funds raised by banks and local government.

Sweden has a particularly active real estate sector, so it is not surprising to see a lot of green bond issuance emerging from there. In 2016, there were two new private sector issuers: Castellum and Fabège, the latter under a labelled Green MTN program – the first of its kind. In 2017, there were two more: Humlegården and Atrium Ljungberg, which is already a repeat issuer!



Private sector. We fully expect the private sector to continue to tap the debt capital market for growth and property improvements. Two examples of potential issuers are Wallenstam and Citicon Oy.

Wallenstam (Sweden), which has issued two green bonds through its Svensk NaturEnergi subsidiary to fund renewable energy, may also be able to source assets for Low Carbon Buildings and energy efficiency improvements. Wallenstam is already a vanilla bond issuer, i.e. known to investors.

Citicon Oy (Finland), which has a large shopping centre portfolio across the Nordics

and the Baltics could follow in the footsteps of shopping centre giant Unibail-Rodamco, which issued its first green bonds in 2014. Citycon is also a vanilla bond issuer.

However, we also see opportunities in housing and specialised real estate, especially given that many landlords in these sectors are government-backed entities.



Housing companies have the potential to become green bond issuers. Issuance to date features only five Swedish companies – a surprisingly low number, given the high level of local government ownership of housing.

Housing associations in big urban centres such as Helsinki should be able to follow Sweden's lead. Even in Sweden, there are large municipal housing companies larger than the three green bond issuers who may be able to identify appropriate Low Carbon Buildings pools or fund energy efficiency improvements through green bonds.



Specialised real estate companies which own and manage public buildings (e.g. care homes, schools, student facilities) are a great way to combine the environmental and social agenda.

There have been green bond issues from three such companies, and all could be repeat issuers. Privately owned Entra (Norway) manages a large portfolio of government offices. Specialfastigheter (Sweden) has a wide range of assets under management including courts, police stations and institutional care facilities. Hemsö (Sweden) owns and manages primarily education and healthcare facilities.

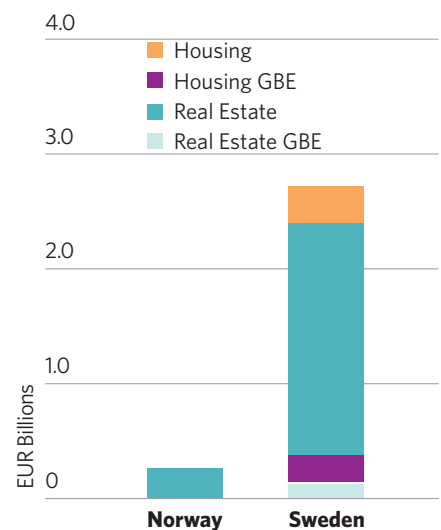
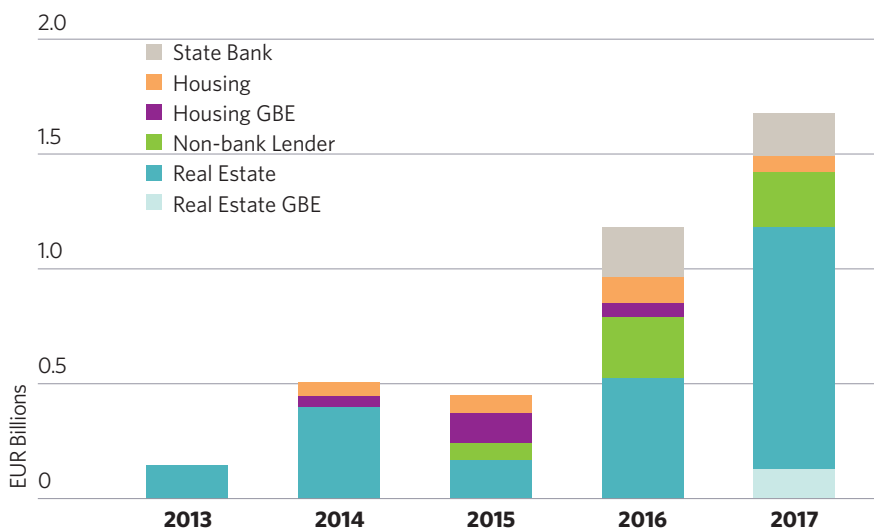
What has been achieved so far is impressive. Still, given the high level of involvement of local government in the provision of public services, there is scope to scale up and expand issuance across the region.

An example of an existing vanilla bond issuer that could potentially fit the bill is Akademiska Hus AB, a state-owned Swedish company that owns and manages the research and university property, including student accommodation. In the US, for example, State Universities have been quite successful in raising funding in the green bond market to improve their built environment.



Public infrastructure such as railway stations and other urban spaces that promote less travel, or travelling by train rather than by car. An example is Jernhusen (Sweden) which develops and manages railway stations and city neighborhoods.

Over 90% of green bonds issued by property companies and lenders were originated in Sweden



Financing Renewable Energy

Raising funds for investment in renewable energy is a key use of proceeds in the Nordics. Energy companies account for EUR3.1bn of issuance. A further EUR1.4bn is allocated to the sector from funds raised by banks and local government.

The first issuers in the sector were Sweden's Arise and Aligera who entered the green bond market in early 2014. The largest is Denmark's Ørsted due to its EUR1.25bn issue from November 2017. Finland has negligible presence with just one recent issuer: state-owned grid company Fingrid.

There is clear potential given the prevalence of district heating in the Nordics, combined with strong investment in renewable energy sources, as well as grid improvements to handle variable flow from renewable energy.



Similar to Fingrid, Norway's electricity grid company Statnett could be a potential green bond issuer not just vanilla bond issuer.

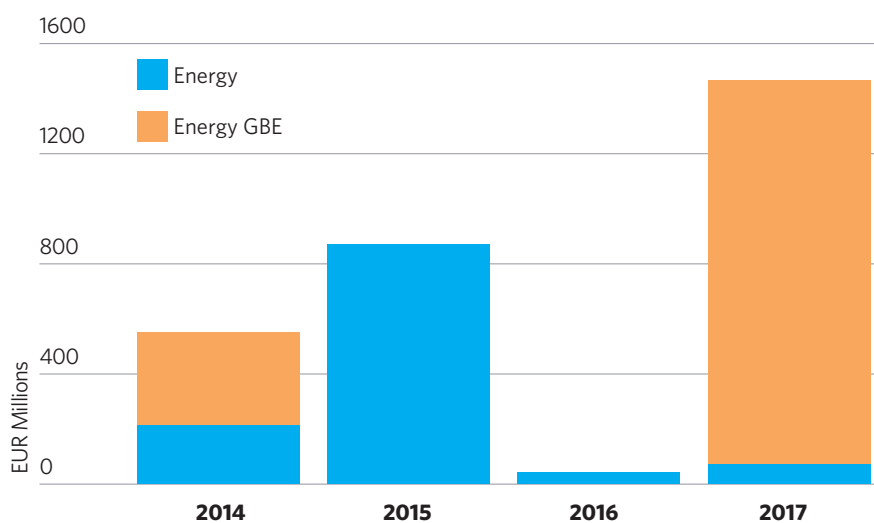


In Norway, there are over a dozen government-backed energy companies - primarily involved in district heating - that have outstanding bonds sized at NOK500m or more and listed on the Oslo Stock Exchange. Only five have issued in the green bond market.

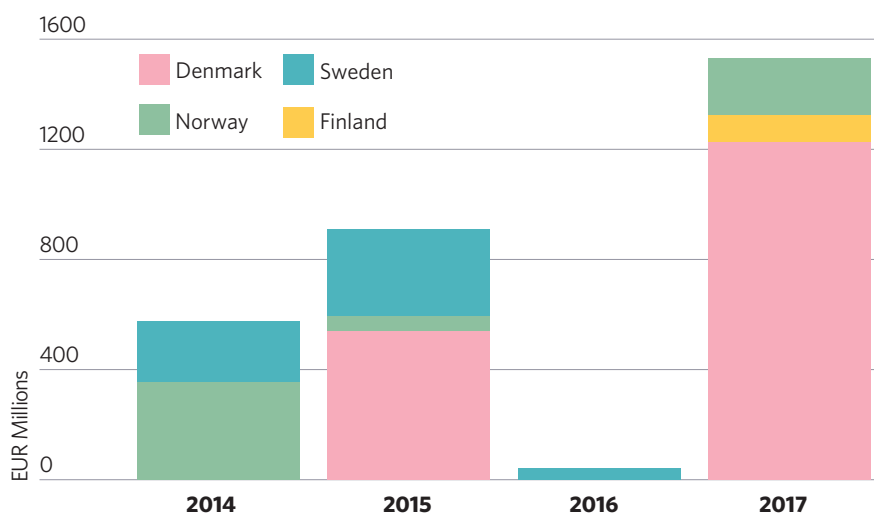
Financing district heating from renewable energy and waste management is not unique to Norway. There are over 460 municipal district heating companies in Denmark. In Sweden, only Fortum Värme has issued a green bond.

Given that the vast majority of housing is heated centrally and the energy mix is skewed in favour of renewable energy, there must be suitable projects, albeit some smaller issuers may need the assistance of an aggregator, e.g. an LGFA.

Municipal energy companies dominate



Denmark is No. 1 thanks to Ørsted



In Finland, an example would be Vapo Oy, an energy company, which among other business areas provides district heating and fuel solutions to industry.

In Iceland, it could be companies which provide heating generated from geothermal sources.

While the Climate Bonds Initiative is selective around hydropower, there are many companies in the Nordics that could be green bond issuers given the right project in terms of climate impact. Some of them are existing bond issuers such as Kemijoki Oy (Finland) and Statkraft AS (Norway).

Further sector opportunities for green bonds

Smaller sectors for green bond issuance include Low Carbon Transport and Sustainable Land Use. Both have growth potential.



To date the only green bond issuance from a transport company has been the SEK700m (EUR72m) debut green bond from Volvofinans.

Low carbon transport is primarily financed through banks and municipalities.

However, both Norway and Denmark have railway investment plans incorporated in their state budgets and transport strategies that could potentially be funded by green bonds. Both Norges Statsbaner and Danske Statsbaner are existing bond issuers.



There are three Sustainable Land Use green bond issuers, all from Sweden: Svenska Cellulosa Aktiebolaget, Södra Skogsägarna

and state-owned Sveaskog. Forestry is an important economic sector within the region and FSC-related assets would be suitable for green bonds. Based on business activity Norske Skogindustrier (Norway), for instance, may be able to create a green asset pool.

Sectors which are funded only indirectly, i.e. by banks and local government, include water and waste water treatment, waste management and adaptation. While loans may be most suitable for borrowers with small funding requirements, there are some large companies across the region who have

already issued vanilla bonds to finance their investment programs and assets, so are but a step away from green bond issuance. Some examples include:



Käppalaförbundet (Sweden) is a wastewater management company, which serves eleven municipalities.



Gasum Corporation (Finland), for instance, is a leading producer of biogas from biodegradable waste.

Climate measures such as Sweden targeting 50% use of biofuel for vehicles by 2030 could spur production from companies such as Gasum.

Country opportunities

More volume expected from countries of green bond issuance



In **Norway**, municipalities are often repeat issuers on the local market, albeit many of them only issue very small bonds. The biggest issuer is City of Oslo, which has issued one green bond but has another 50 bonds outstanding. There are also multiple companies, particularly municipal energy companies, that have taken advantage of the vanilla bond market. Simply based on the volume of bond issuance from the public sector, there is high potential to convert at least part of that into green bonds, backed by suitable assets.

Then there is the private sector, which is largely absent from the green bond roster. Energy and railway companies are well placed to issue given continued investments. We expect growth in Renewable Energy, Low Carbon Transport and Low Carbon Buildings.



Denmark made a splash when Ørsted issued its debut bond. At EUR1.25bn it represents 20% of the company's total outstanding bonds. However, a notable void is visible in property-backed issuance, especially given that mortgage credit bonds represent almost 80% of all Danish bonds outstanding.



Finland has taken the first steps, primarily through MuniFin issues. While the institution has the intention and asset base to continue down the green bond path, sectors such as forestry, housing, energy generation and district heating, as well as low carbon transport come to mind as potential sources of green bond assets/projects. Covered bond issuers such as OP Mortgage Bank can add to the mix.

Compared to its neighbours, Finland is underrepresented in all of these as well as in municipal issuance. Stockholms Läns Landsting, Gothenburg, Oslo, Malmö have issued green bonds. Helsinki is a notable exception!



Sweden has been forging the green bond path, but is not resting on its laurels. We certainly expect to see more from existing and new issuers, including in the property, energy and local government sectors. But "new" sectors such as water and waste management, adaptation and low carbon transport should be considered in earnest.

The government has extensive investment plans in the climate sector for the 2018-2020 budget period. Expectations that Sweden will issue a sovereign green bond have risen as a government inquiry commissioned by Per Bolund, Minister for Financial Markets and Consumer Affairs, was recommended by government recently.¹⁹

The case for Iceland



Iceland benefits from substantial geothermal energy resources. Geothermal power generation for electricity and heating lends itself well to green bond issuance. A possible issuer is Landsvirkjin, the national power company which has already issued international vanilla bonds.

Reykjavik's Municipal Plan 2010-2030 and Climate Policy 2020 feature a range of measures in respect of public transport, electric vehicles and low carbon buildings.

Local government has experience with bond issuance, albeit domestically. Direct issuance could be an option for Reykjavik, given the comparatively bigger investment plans for the capital including improved rail transport links and the creation of a public transport corridor as part of its plans to reduce GHG emissions from automotive travel and public transport to zero by 2040.

The largest domestic bond issuer, the Housing Financing Fund, may also be able to raise green bond funding for energy efficient housing or upgrades.

Alternatively, LGFA MCI could act as a debt aggregator to scale up funding for others. It is already a domestic vanilla bond issuer.

A sovereign issue is also an option as a way to fund a variety of projects.

Drumming up even more support for the Green Bond Market

Investor engagement in sustainable investment is increasing, particularly from the large pension funds in the region. Asset managers further underpin demand for green bonds and increase liquidity.

Over the course of 2017, Sweden's AP7 and Norway's USD1tn sovereign wealth fund have clearly signalled that they are and will divest of fossil fuel investments. More explicit support for climate-aligned investments from pension funds and their asset managers, would provide a further vote of support for the green bond market.

Stock exchanges. The creation of a green bond list on stock exchanges provides visibility and discoverability of green bond issuance. Oslo Stock Exchange and Nasdaq Stockholm have had green/sustainability

bond segments since 2015. Hopefully, Finland and Denmark will follow.

The extension of the First North listing venue to green/sustainable bond issuers will provide easier market access to smaller issuers and for private placement, coupled with greater visibility for the SRI investor base.

Facilitating market access for smaller issuers. Finding ways to decrease green bond issuance costs would certainly help smaller issuers. Pooling funding requirements and issuing through a common funding vehicle is one way to achieve this. Alternatively, Nordic governments could consider targeted incentives such as covering external review costs for certain issuers (similar to Singapore) or providing

tax deductibility for issuance costs (similar to Malaysia). This could be similar to tax incentives for electric vehicles, which were introduced in Iceland recently.

The use of LGFAs as aggregators is a best-practice example of scaling up financing for public sector investments. Alternatively, the use of a joint funding platform is a structure that can be deployed for any sector, any type of issuer and in any market – given the will to cooperate! It can provide bond market access to a wide range of issuers that may lack size to make direct bond issuance economically viable.

In Finland, for example, six cities²⁰ have agreed to cooperate on innovation – in a similar vein, they could pool resources to issue green bonds.

Conclusions

The Nordic countries are at the forefront of defining “green”. Their green bond markets have evolved in the context of the Nordic Model, which relies strongly on consensus and cooperation to achieve equitable and sustainable social development. Environmental and wider sustainability targets are integrated into local and central government budgeting and in key laws such as building codes. All of this provides

for wide support of related initiatives and climate-aligned investments.

This has resulted in the growth of the Nordic green bond market. Underwriting banks and issuers have sought access to the market to showcase sustainability aspirations. The very high use of external reviews and the new focus on impact reporting across the region contribute to improving market integrity and

are setting standards for others to emulate.

Increasing support for the market through investors, stock exchanges, cost-focused incentives for smaller issuers and the continued use of aggregation to pool funding requirements should help the Nordic markets to continue to grow and innovate.

Last, but not least, sovereign issuance from the region would further support climate action.

Endnotes

1. For more information on Mission 2020, visit <http://www.mission2020.global/milestones/finance/>
2. For more information on the Sustainable Development Goals, see <http://www.undp.org/content/undp/en/home/sustainable-development-goals.html>
3. Green public building procurement guide, Environmental Guide 2017, Ministry of the Environment, Department of the Built Environment
4. For more information on Sweden's new Climate Act, see <http://www.government.se/press-releases/2018/01/as-of-today-sweden-has-a-new-climate-act/>
5. Finland figures throughout this report excluding issuance from the supranational Nordic Investment Bank, headquartered in Helsinki, as the institution is jointly owned by the states of Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway and Sweden.
6. Some of this issuer's bonds have now matured.
7. The Position Paper on Green Bond Impact Reporting can be retrieved here <https://www.munifin.fi/recents/news/2017/10/24/nordic-issuers-release-guide-on-green-bonds-impact-reporting>
8. Participants: City of Göteborg (SE), Kommunalbanken (NO), Kommuninvest (SE), Municipality Finance (FI), Municipality of Norrköping (SE), Municipality of Örebro (SE), Stockholm County Council (SE), Swedish Export Credit Corporation (SE), Kommunekredit (DK) has participated in the group as an observer, with the intention to comply with the positions of this paper at a later stage. In addition, Municipality of Borås and Swedish Association

of Local Authorities and Regions (SALAR) have participated in the development work, as representatives of the Kommuninvest Green Bonds Environmental Committee
9. International Financial Institutions (IFIs): Green Bonds, Working Towards a Harmonized Framework for Impact Reporting, Dec 2015
10. The European Investment Bank issued its first sustainability bond focused on climate change in June 2007, but the term “Green Bond” was coined for the World Bank's 2008 issue
11. <https://sebggroup.com/large-corporates-and-institutions/our-services/markets/fixed-income/green-bonds>
12. For more information, see <https://www.storebrand.no/en/sustainability/climate-strategy>
13. Source: <http://nordsip.com/2017/09/05/sppstorebrand-signs-green-bond-principles/>
14. Public sector for this report includes local government, LGFAs and government-backed entities, but does not include state banks (other than KBN as an LGFA) and NIB
15. The MOC and SOE category includes companies which are at least 50% owned by local or central government. So Ørsted (prev. DONG Energy) is included since the Danish state holds a 50.1% share, but Entra AS is not because the Norwegian government holds a 33.4% share.
16. For more on Reykjavik's Municipal Plan 2010-2030 and Climate Policy 2020, see <http://reykjavik.is/en/reykjavik-and-climate>
17. Data provided by NIB's Head of Funding and Investment Relations

18. Total outstanding bonds as per Thomson Reuters Eikon. Green bond issue amount and number of bonds as per the Climate Bond Initiative's labelled green bonds database.
19. For press coverage, see <https://www.globalcapital.com/article/b16fyz-9vww0dpg/swedish-state-green-bond-a-golden-egg-says-minister>
20. For more information on the 6 Aika initiative for supporting urban innovation, see <https://6-aika.fi/in-english/>
21. The LM Group Holdings bond was redeemed early.
22. The issuer defaulted on its bond in November 2017. The bond was accelerated by the trustee in January 2018. However, bondholders intend to convert their claims under deal guarantees into equity and new debt in the related operating companies to recover value from the assets (operating wind turbines).
23. See Understanding green and climate bonds, Inclusion in the Climate Bonds Initiative's database on the inside cover

Appendix. Nordic green bond issuance

Country / Issuer sector	Green bond issuer	Amount EURm	Green bonds	Active since	Latest issue	Tenor min	Tenor max
Supranational	NIB Nordic Investment Bank ⁶	2,978	18	Feb-10	Aug-17	2	20
Denmark		2,301	5	Mar-15	Nov-17	5	12
LGFA	KommuneKredit	500	1	Jun-17	Jun-17	10	10
Energy Wind	Ørsted (prev. DONG Energy)	1,250	2	Nov-17	Nov-17	12	1001
	LM Group Holding ²¹	51	1	Oct-15	Oct-15	5	5
	Vestas	500	1	Mar-15	Mar-15	7	7
Finland		1,007	4	Oct-16	Nov-17	2	10
LGFA	MuniFin Municipality Finance	907	3	Oct-16	Oct-17	5	10
Energy Grid	Fingrid	100	1	Nov-17	Nov-17	10	10
Norway		2,686	29	May-10	Nov-17	2	10
LGFA/State Bank	KBN Kommunalbanken AS ⁶	1,555	13	May-10	Nov-17	3	10
Bank	DNB Bank	116	1	Feb-15	Feb-15	5	5
Local Government	City of Oslo	158	1	Dec-15	Dec-15	9	9
Energy Solar	Scatec Solar ASA	131	2	Nov-15	Nov-17	3	4
Energy GBE	Agder Energi	77	1	Nov-17	Nov-17	10	10
	BKK AS	131	1	Oct-14	Oct-14	7	7
	Lyse AS	55	1	Apr-17	Apr-17	6	6
	Vardar AS	32	1	Dec-14	Dec-14	5	5
	NTE ⁶	89	3	Nov-14	Nov-14	3	7
Real Estate	Entra ASA	219	3	Sep-16	May-17	2	7
	OBOS Forretningsbygg	44	1	Nov-17	Nov-17	5	5
Sweden		10,239	119	Oct-13	Dec-17	2	7
State Bank	SBAB Bank	397	2	Jun-16	Oct-17	5	5
	Swedish Export Credit	444	1	Jun-15	Jun-15	5	5
LGFA	Kommuninvest	1,511	3	Mar-16	May-17	3	4
Bank	Nordea Bank	500	1	Jun-17	Jun-17	5	5
	SEB	500	1	Feb-17	Feb-17	5	5
	Swedbank	500	1	Oct-17	Oct-17	5	5
Local government	City of Gothenburg	601	7	Oct-13	Jun-17	6	6
	City of Lunds	77	1	May-17	May-17	2	2
	City of Malmö	131	2	Dec-17	Dec-17	4	6
	City of Norrköping	62	1	Oct-16	Oct-16	6	6
	City of Västerås	76	2	Nov-16	Nov-16	5	5
	Örebro Kommun	133	3	Oct-14	Oct-16	5	5
	Region Skåne	124	1	Oct-16	Oct-16	5	5
	Stockholms Läns Landsting	518	5	May-14	Jun-17	5	6
Agri/Forestry	Södra Skogsägarna	107	1	Jun-16	Jun-16	5	5
	Svenska Cellulosa AB	170	2	Mar-14	Mar-14	5	5
Agri/Forestry GBE	Sveaskog	213	3	Mar-16	Sep-17	5	5

continued

Country / Issuer sector	Green bond issuer	Amount EURm	Green bonds	Active since	Latest issue	Tenor min	Tenor max
Sweden							
Energy Heating	Fortum Värme	266	2	May-15	May-15	6	7
Energy Wind	Aligera ²²	44	2	May-14	Nov-14	5	5
	Arise AB ⁶	159	2	Apr-14	Sep-14	3	5
	Wallenstam, Svensk NaturEnergi	98	2	Mar-15	May-16	2	4
Housing	Rikshem AB ⁶	349	12	May-14	Oct-17	2	5
	SKB	30	1	Nov-16	Nov-16	5	5
Housing GBE	Fastighets AB Förvaltaren	161	3	Oct-14	Sep-16	2	5
	Stångåstaden	113	3	Sep-15	Oct-16	5	5
	Uppsalahem	53	1	Sep-15	Sep-15	5	5
Real Estate	Atrium Ljungberg	249	5	Mar-17	Oct-17	3	6
	Castellum	103	2	Oct-16	Oct-16	5	5
	Fabege AB	254	7	May-16	Oct-17	2	5
	Humlegaarden Fastigheter AB	131	1	Jul-17	Jul-17	5	5
	SFF ⁶	579	13	Nov-15	Nov-17	2	5
	Skanska AB	96	1	Mar-14	Mar-14	5	5
	Vasakronan AB ⁶	1,138	19	Nov-13	Oct-17	2	7
Real Estate GBE	Specialfastigheter	126	2	Nov-17	Nov-17	5	7
Transport	Volvofinans	72	1	Jun-17	Jun-17	5	5
Grand Total		19,207	178	Feb-10	Dec-17	2	1001

Pending green bonds²³

Sector	Green bond issuer	Country	Amount EURm	Bonds Issues	Active Since	Latest issue	Tenor min	Tenor max
Real Estate GBE	Hemsö Fastighets AB	Sweden	107	2	May-16	May-16	5	5
Energy GBE	Eidsiva Energi	Norway	80	1	Sep-17	Sep-17	6	6
Local Government	City of Östersund	Sweden	80	1	Dec-17	Dec-17	5	5

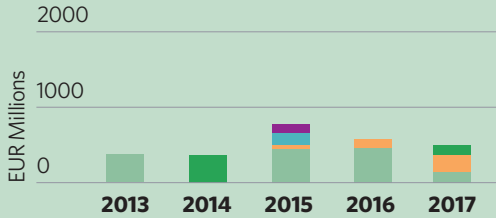
Hemsö's sustainability bonds fund primarily low carbon buildings and energy efficiency improvements in public buildings such as schools and care homes. However, up to 10% may be allocated to social uses such as internal or external areas of school premises or nursing homes, which improve learning resp. well-being, or adapting premises for refugee housing. If actual allocation to purely social uses is within 5% the bond will be included in the CBI labelled green bond database.

Eidsiva Energi proposes to use the proceeds from the bond for hydro projects and improvements in energy efficiency at a district heating plant. The Climate Bonds Initiative has reservations about certain types of hydro projects and seeks to determine the scale of climate impact before inclusion. There are two aspects under consideration with respect to district heating: (a) energy source – fossil fuels are undesirable and (2) scale of energy improvements, i.e. level of climate impact.

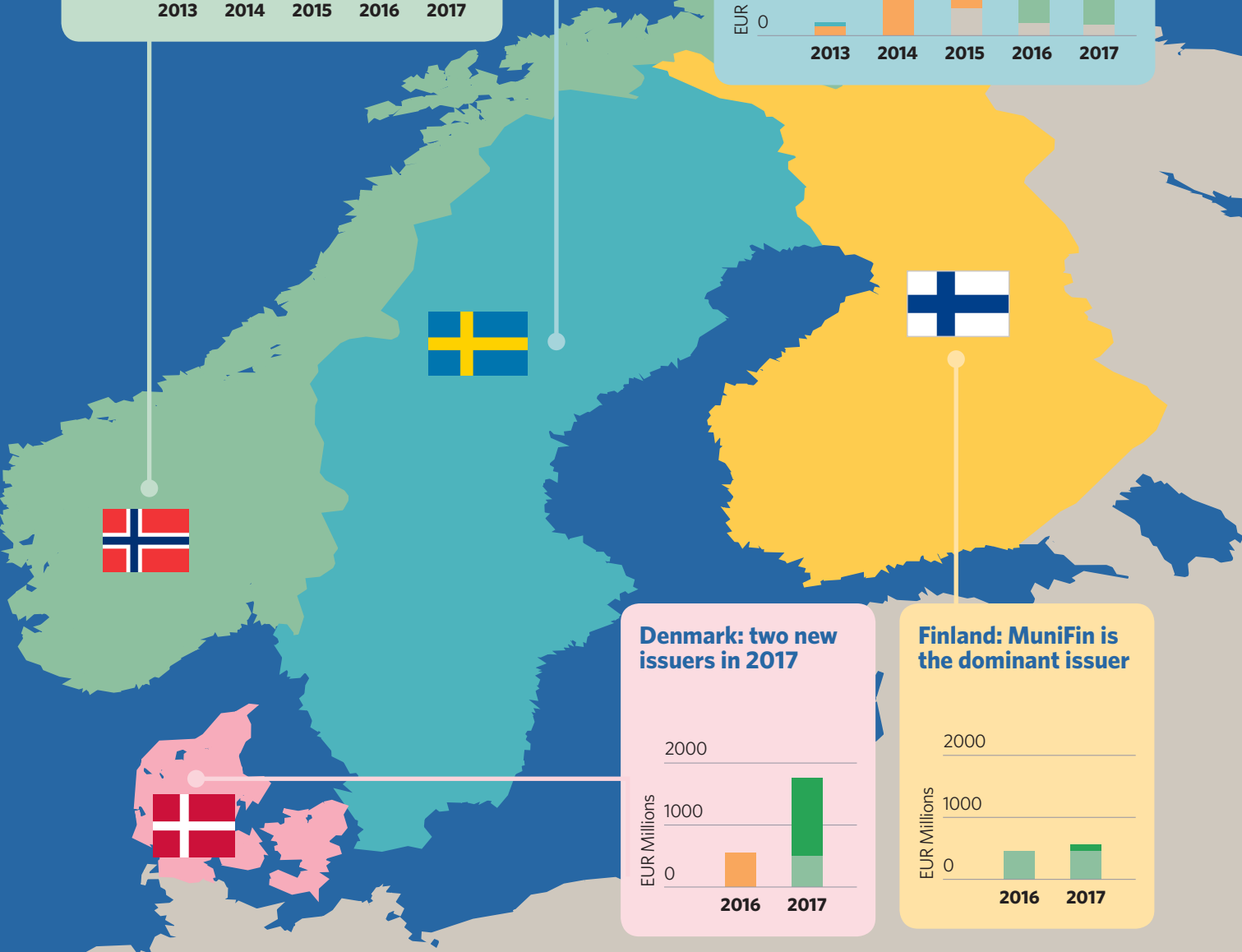
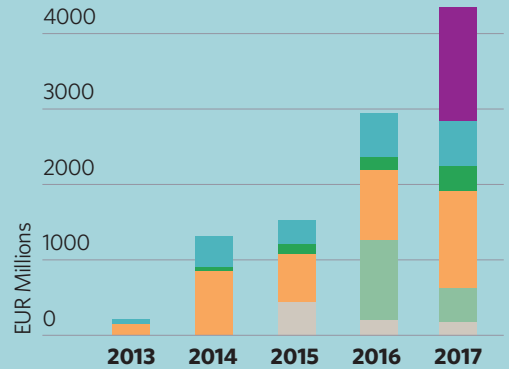
City of Östersund proposes to use part of the proceeds to fund hydropower with water-rights court ruling in Sweden or concession in Norway and the Climate Bonds Initiative requires further information on this aspect. We are also seeking to clarify the parameters around the production of hydrogen from electrolysis and other residual flows, another potential use of proceeds.

- Financial corporate
- State bank
- Local government
- LGFA
- Government-backed entity
- Non-financial corporate

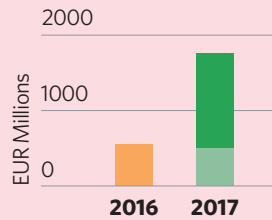
Norway: diversified green bond market



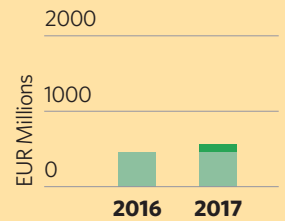
Sweden: largest most diversified Nordic green bond market



Denmark: two new issuers in 2017



Finland: MuniFin is the dominant issuer



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Source data from Thomson Reuters Eikon, climatebonds.net and other parties. All figures are rounded.

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