Funding the transition to carbon neutrality

Report for the Government of Jersey

Final report

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Introduction

This high-level report seeks to support the Jersey Government's ongoing work on its carbon neutrality policy .

Section 1 provides a typology covering the main avenues that Governments have open to them for funding expenditure.

Section 2 provides more detailed descriptions of some of the more innovative funding options that Governments in other jurisdictions have used in order to help meet the challenges of decarbonisation.

The report is **descriptive only** and does not include any analysis of the viability for Jersey of any of the options or provide any recommendations.

The research is based on **information gathered through internet searches of publicly available information** and does not include any stakeholder interviews. The research was undertaken over a very short period of time in late July/Early August 2021.

1 A typology of government funding options

Figure 1 provides an overview and typology of the revenue-raising options that are available to Government in general. In the remainder of this section, we discuss each of those funding mechanisms in turn.

Figure 1 Funding options typology

Taxation & charges	**Monetising assets**
General taxation	Privatisation
Hypothecated taxes	Equity issuance of government-owned entities
User fees and charges	Reserves
Borrowing	'Printing' money
Issuing general bonds	**Encouraging private investment**
Investment-specific bonds	Guarantees and government insurance
Savings schemes	Subsidised loans
International financial institutions	Grants
Commercial bank loans	Match-funding
Performance improvement	Public-private finance
Public services	Crowd- & community-based funding
Commercialised services	Regulations and standards
	Carbon offset markets

Source: London Economics

1.1 Taxation and charges

Governments impose a range of taxes on their citizens. The main objectives for taxes are varied, but are generally for **revenue-raising,** income or wealth **redistribution** and **behavioural change.**

Individual taxes can have multiple objectives and **general tax revenues** are generally not earmarked for specific expenditures – they contribute to the Government's **overall revenue.** The largest sources of general tax revenue in Jersey are the income tax (personal tax and company tax) followed by the Goods and services tax (GST) and Impôts (excise duty).

Certain **environmental taxes** fall under this general tax income category. While those types of environmental taxes are thought to provide a valuable lever for governments to achieve environmental objectives to the extent that they are expected to lead to a behavioural change, funds obtained through those taxes are not directly ring-fenced to be spent on environmental projects. An example of such a non-earmarked environmental tax that is the **Air Passenger Duty** charged on passenger flights from UK airports. The **carbon fees and dividends regime** discussed in the subsequent Section are also not designed to fund specific environmental projects.

For other taxes, revenue is earmarked for specific expenditure items – this is known as **hypothecation.**

An example of such a hypothecated environmental tax is the **fuel duty in Jersey.** Currently, any above RPI increase in the fuel duty is earmarked to fund the **Climate Emergency Fund,** which in turn funds environmental projects. Contributions to the **long-term care fund** in Jersey could be viewed as a hypothecated tax as well.

Hypothecation can make new taxes **more palatable to citizens if they can see that revenues from the tax are going to be spent on something specific** that they value.

In **traditional public finance theory,** however, the use of a general tax, raised based on the principle of *ability-to-pay*, is favoured over the use of hypothecated taxes. Opponents of hypothecation argue that **social welfare is maximised, and resources are allocated most efficiently** if the level of public spending is **determined by the policy decisions** of the government, rather than being dictated by the amount of revenue raised by a specific hypothecated tax. Moreover, hypothecation is often said to **reduce the flexibility of the fiscal system** and to make it more difficult for governments to react to changes in the economy[1].

In line with this more traditional view, Jersey's Fiscal Policy Panel recommends that **'the use of hypothecation only be introduced where the revenue and spending are likely to be justifiably related, and that any new important areas of investment should not be constrained by the ability to find a new method of funding'.**

[1] https://www.gov.je/SiteCollectionDocuments/Government%20and%20administration/20191007%20Fiscal%20Policy%20Panel%202019%20Annual%20Report.pdf

In addition to taxes, Governments **charge** users for the provision of some services or the **use of certain public infrastructure,** e.g., payment for the use of publicly owned sports facilities or congestion charges. Again, it is common for certain charges to be designed to achieve environmental objectives. Those charges can again contribute to the Government's overall revenue or be earmarked. For example, net revenue from the **Congestion Charge in London** must be spent on further improvements to transport across London.

Sometimes, the government also uses regulation to charge users for the use of products or services provided by private sector entities. For example, large retailers in England are required by law to charge 5p for all single use **plastic carrier bags** and to donate all proceeds to good causes, particularly environmental causes.

1.2 Borrowing

Another way for Governments to raise funds is through borrowing. All borrowed funds ultimately need to be repaid – for the Government of Jersey these repayments would be funded through either increased taxes or reduced spending.

Governments most commonly borrow funds from the financial markets by issuing bonds. Generally, the funds raised from bonds are not earmarked for specific expenditures **(general bonds),** though this has sometimes been the case e.g., 'war bonds'. In the next section, we moreover discuss some innovative examples of such **investment-specific** 'green bonds' issued in other jurisdictions.

Governments also borrow funds directly from householders through **savings schemes,** such as 'National Savings' in the UK. These funds are not usually earmarked for specific spend, but the UK National Savings scheme is currently planning to launch a Green Bond where funds would be earmarked for environmental schemes.

In addition to raising funds in financial markets, Governments are sometimes able to borrow directly from **international financial institutions.** This can be for general public deficit support (e.g., from the IMF) or be project specific (e.g., from the development banks such as the World Bank, Asian Development Bank, European Bank for Reconstruction and Development etc). The European Investment Bank (EIB) in particular have played a key role in financing the transition towards greener energy in several projects in recent years; however, being an EU institution, the EIB is not likely to be a viable funding source in the Jersey context.

Finally, governments can borrow funds from **commercial banks.** To support households and the economy during and after the pandemic, Jersey's Minister for Treasury and Resources signed a Ministerial Decision to enter into a Revolving Credit Facility (RCF) for a maximum of £500 million. The RCF is being provided by a consortium of five local banks (Barclays, Butterfield, HSBC, Lloyds and RBS International). While borrowing from private sector banks is sometimes considered to be more expensive and more restrictive than using instruments which are only available to the public sector[2], borrowing costs depends on how much and how often governments are borrowing .

[2] https://www.local.gov.uk/financing-green-ambitions-full-report

1.3 Improving performance and re-prioritising government spending

Another way for the government to obtain funding is to improve its service delivery. Put differently, by increasing the efficiency and effectiveness through which the government provides its **public services,** funds from other sources can be retained for spending on issues including decarbonisation.

Similarly, a **re-prioritisation of spending on existing public services** can be one way of increasing funds available for decarbonisation programmes.

For **commercialised services** that are publicly owned (e.g., Post Office and Ordnance Survey in the UK), there is moreover scope to raise additional revenues through changes in prices and the range of services on offer, in addition to the potential for improving performance through cost savings.

1.4 Monetising assets

The **sale of state-owned assets** to the private sector is another mechanism for raising funds, though is only available to the extent that the State has positively valued assets to sell that the private sector is willing to purchase.

Governments have the option to **fully privatise** their assets or raise a potentially small percentage of capital through equity issuance of state-owned enterprises.

Drawing down of the state's **financial reserves** is another alternative way of monetising assets.

Finally, governments are able to **create new money** – often this is known as 'printing' money, but in reality, it is now generally created electronically. As a practical policy option, this is only available to governments who, unlike Jersey, have their own independent free-floating currency.

1.5 Encouraging private investment

Another way for governments to tap into funds to finance decarbonisation policies is to **'crowd-in' private funds.**

Government assistance targeted at drawing in private funds can take many forms, and includes **guarantees and insurance** provided to protect the private investors from certain low-probability but high-impact risks (e.g., guarantees for providing temporary liquidity or infusing additional equity in the event of cost overruns); **subsidised loans** whereby the government covers part of the interest owed by private investors; or **one-off grants** to fund early stage, high-risk activities e.g., R&D.

Another method for the government to kickstart private investment is **match-funding,** e.g., the government invites bids for carbon schemes and for the selected schemes agrees to pay half (or some other %) of the costs. This type of match-funding is used by European Commission structural funds.

There are furthermore a range of mechanisms for **combining public and private finance** and risk bearing in relation to public services and assets. For example, they might involve giving private companies a right to receive payment from others who are using a publicly owned asset (e.g., a tolled road) in exchange for the private company paying for or towards construction of the asset. The M6 toll road is one of many examples of this approach in the UK.

Whereas the examples above mostly describe approaches to incentivise individual corporate or private investors to fund a particular project, the government can moreover take advantage of the appetite for funding environmental causes of the wider public by making use of **community-funding schemes and crowdfunding platforms.**

Finally, the government can make private funding available for decarbonisation projects through **regulation and standards.** For example, regulation can be used as a means to reduce the risks for private sector investors (see the Thames Tunnel Tideway project described in Section 2.3.1). Similarly, **mandatory carbon offset schemes and markets** (compliance schemes) are essentially a way of making private companies or individuals invest into carbon-offsetting projects.

2 Examples of innovative funding mechanisms used in other jurisdictions

This report section provides examples of innovative funding options that are being used or investigated by governments in other jurisdictions to finance and/or achieve behavioural objectives for their decarbonisation policies.

2.1 Innovative taxation and charging mechanisms

2.1.1 Carbon taxes and carbon fees and dividend schemes

Carbon taxes

A carbon tax is a **fee imposed on the burning of carbon-based fuels (coal, oil, and gas).** The carbon tax is levied upstream on the fuel at extractions or when it is imported. Suppliers are then free to pass along the tax downstream to consumers.

One of the reasons for the continued use of fossil fuels is that they remain one of the cheapest sources of energy, due their high energy density and the infrastructure that has developed around them. However, the **current price of fossil fuels do not account for their true cost to society**[3] because the negative environmental externalities are not priced in. The idea of carbon taxes is to increase the price of carbon paid by firms and individuals so that the carbon cost is more reflective of the true societal cost.

As of 2019, carbon prices have been **implemented or scheduled in 30 jurisdictions.** South Africa became the first county in Africa to price carbon, and Singapore the first Asian county to introduce a carbon tax[4]. Sweden levies the highest carbon tax rate at the equivalent of $137 per tonne of carbon emissions, followed by Switzerland and Lichtenstein ($101) and Finland ($73). The lowest rates are set in the Ukraine ($0.30) and Estonia ($2.36)[5]. In 2019, $45 billion was raised in carbon pricing revenues, with over half going into environmental and development projects.

The **scope of carbon taxes varies substantially** by country. Spain, for example, only applies a carbon tax to fluorinated gases which make up only 3% of total greenhouse gas emissions, whereas Norway covers over 60%[6]. Proposals on carbon adjustments in Europe have also started to emerge more frequently. There is a concern that differences in carbon pricing policies will cause movement of production and emissions to jurisdictions with less stringent carbon policies, this is referred to as **carbon leakage**[7]**.** To reduce carbon leakage, a border adjustment has a been proposed which levies an import fee on products from countries that do not price carbon, to prevent firms avoiding higher

[3] https://citizensclimatelobby.uk/climate-income/policy-makers/carbon-fee-dividend/

[4] https://openknowledge.worldbank.org/bitstream/handle/10986/33809/9781464815867.pdf?sequence=4&isAllowed=y

[5] https://taxfoundation.org/carbon-taxes-in-europe-2021/

[6] https://taxfoundation.org/carbon-taxes-in-europe-2021/

[7] https://openknowledge.worldbank.org/bitstream/handle/10986/33809/9781464815867.pdf?sequence=4&isAllowed=y

costs by relocating to countries without a carbon tax[8]. While border adjustment has been discussed frequently, it is yet to be implemented.

A carbon tax is considered to be a **cost-effective** measure to reduce emissions, according to economists and climate scientists[9]. As the carbon content of all fossil fuels is precisely known, a carbon tax can obey these exact proportions, which makes it a **simple tax to both document and measure[10].**

Imposing a price on carbon also **signals to investors** that low-carbon investments are valuable today and will be even more valuable in the future[11]. Economists suggested that a robust and gradually increasing carbon tax on the sale of fossil fuels could therefore have **beneficial impacts on the scale of technological innovation and the development of infrastructure** as well as accelerating the diffusion of carbon-efficient goods and services[12].

However, carbon taxes are considered to have a regressive distributional impact to the extent that they affect low-income households, for which energy bills represent a higher share of the overall household income, disproportionately[13].

Carbon fees and dividends

In some jurisdictions, the **collected carbon taxes are re-distributed to citizens** in the form of equal lump-sum rebates[14]. The combination of carbon fees and re-distribution mechanisms, often referred to as **'carbon fee and dividend' schemes,** seeks to ensure fairness and maximise political viability. Redistribution of revenues moreover bears the advantage, compared to the standard carbon tax, that it **counteracts a potential regressive distribution of cost[15].** The injection of income from these dividends into the economy can go on to increase aggregate demand, create jobs and spur further innovation.

An economic impact assessment in 2014 of the potential implementation of a **'carbon fee and dividend'** scheme in the US concluded that there would be **substantial benefits to both sustainability and the economy[16].** The authors suggested that these benefits could be realised by a carbon fee of $10 per tonne of carbon dioxide which increased linearly at $10 per year, and 100% of the proceeds would be refunded to US households on a monthly basis. Their study predicted that,

[8] Condon, Madison (2013). "Border Carbon Adjustment and International Trade: A Literature Review". OECD Trade and Environment Working Papers.

[9] https://www.econstatement.org/

[10] https://www.carbontax.org/whats-a-carbon-tax/

[11] https://openknowledge.worldbank.org/bitstream/handle/10986/33809/9781464815867.pdf?sequence=4&isAllowed=y

[12] https://www.econstatement.org/

[13] Landis, F. (2019) Cost distribution and equity of climate policy in Switzerland, Swiss Journal of Economics and Statistics, 155(11)

[14] https://www.econstatement.org/

[15] Landis, F. (2019) Cost distribution and equity of climate policy in Switzerland, Swiss Journal of Economics and Statistics, 155(11)

[16] https://11bup83sxdss1xze1i3lpol4-wpengine.netdna-ssl.com/wp-content/uploads/2018/05/The-Economic-Climate-Fiscal-Power-and-Demographic-Impact-of-a-National-Fee-and-Dividend-Carbon-Tax-5.25.18.pdf

under this scheme, 2.1 million jobs would be created, carbon emissions would reduce by 33%, and 13,000 premature deaths would be saved due to better air quality[17].

Two examples for such schemes are provided in the Boxes below. The carbon fee and dividend scheme is also politically supported in the US[1819], the European Union[20] and Australia[21], but not yet implemented.

Box 1 Case study: Carbon fees and dividends in Canada

Canada was the **first country to adopt a carbon fee and dividend scheme** in January 2019[22]. The federal government set minimum pricing standards on the system; the minimum price starts at $40 per tonne of carbon dioxide which is planned to reach $170 per tonne by 2030. Provinces and territories can set their own tax rates that either meet or exceed this standard. If a province sets a rate below the standard, the federal government applies a "backstop" that applies the minimum price through federal taxes.

The Government of Canada uses **90% of fuel charge proceeds to support families through payments delivered through annual tax returns,** whereby the majority receive more money than they paid in carbon taxes[23]. For people that live in rural or smaller areas and thus lack the accessibility to clean transportation, they receive an additional 10% top-up on their payments[24].

Box 2 Case study: Carbon fee and dividends in Switzerland

Switzerland also has a carbon fee and dividend scheme in place, with one of the **highest carbon tax rates of the world** at around $105 per tonne of carbon dioxide[25]. Two-thirds of the carbon revenues are redistributed back to consumers[26]. The remaining third is used to finance energy efficiency and renewable energy programmes[27].

[17] https://11bup83sxdss1xze1i3lpol4-wpengine.netdna-ssl.com/wp-content/uploads/2018/05/The-Economic-Climate-Fiscal-Power-and-Demographic-Impact-of-a-National-Fee-and-Dividend-Carbon-Tax-5.25.18.pdf

[18] https://citizensclimatelobby.org/price-on-carbon/

[19] https://www.coons.senate.gov/news/press-releases/sens-coons-and-feinstein-rep-panetta-introduce-bill-to-price-carbon-pollution-invest-in-infrastructure-randd-and-working-families

[20] https://europa.eu/citizens-initiative/initiatives/details/2019/000006_en

[21] Snell, Stuart (2019). "New Carbon Dividend Proposal Gets Community Support". Available at: https://newsroom.unsw.edu.au/news/business-law/new-carbon-dividend-proposal-gets-community-support

[22] https://citizensclimatelobby.uk/news/2018/10/canada-to-be-first-country-with-carbon-fee-and-dividend/

[23] https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/putting-price-on-carbon-pollution.html

[24] https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/putting-price-on-carbon-pollution.html

[25]https://www.swissinfo.ch/eng/new-european-co2-tax-law-to-have-limited-impact-on-swiss-companies/46778960#:~:text=The%20goal%20of%20the%20Swiss,the%20highest%20in%20the%20world.

[26] https://www.zurich.com/en/knowledge/topics/climate-change/why-carbon-pricing-will-help-to-reduce-emissions

[27] Yuschenko, A. & Patel, M. (2017) How carbon tax could contribute to greater CO2 and electricity savings in Switzerland, Institute for Environmental Sciences and Forel Institute

2.1.2 Land value capture

Land value capture (LVC) refers to a set of mechanisms used to **monetise, in part or in full, the increase in land values** that arises in the catchment area of public infrastructure projects or due to other government actions such as changes in land use rules and regulations.

LVC is a way for the government to recover the cost of infrastructure projects[28], including public transport infrastructure projects which help advance the decarbonisation agenda. It is rooted in the notion that the benefits to **private land- and building-owners arising from public investments** in infrastructure should be re-distributed to the public. For example, landowners with good access to a new railway station are likely to see an uplift in the market value of their land, and the idea of LVC is to recover part of this value increase to recover the railway station costs.

There are several implementation mechanisms and instruments for capturing the value of land, the most commonly used being **taxes and fees.** In particular, tax increment financing (TIF) is an instrument which consists of using the future flow of property tax increases generated by a public intervention to finance its costs. Fees include betterment levies or building rights charges which are charges on real estate property owners who benefit from infrastructure improvements[29]. Sometimes, public benefits are recovered through alternative means such as **land leasing** obligations or regulations mandating **inclusionary housing[30].**

LVC is beneficial in its potential to **raise revenue to finance, in part, public infrastructure projects** that generate positive externalities for landowners. However, LVC requires **strong technical and managerial capabilities,** and successful implementation requires a **thorough understanding** of the maturity of land markets, land use regulations, investment policies, and local circumstances[31]. Moreover, there tends to be a **time lag between generation and revenue capture[32].**

LVC is being used in jurisdictions internationally to **finance public transport infrastructure in cities internationally.**

In the UK, '**planning gain'** seeks to capture uplift in the value of land which is generated through the granting of planning permission. The box below provides a case study example from a public transport project in London.

Another successful model of LVC has been developed in **Hong Kong** through the **Mass Transit's Railway.** Similarly, the **Golden Coast Light Rail in Queensland** is partially funded by through taxes on property owners along the route.

[28] https://www.lincolninst.edu/sites/default/files/pubfiles/implementing-value-capture-in-latin-america-full_1.pdf

[29] https://publications.iadb.org/publications/english/document/The-Potential-of-Land-Value-Capture-for-Financing-Urban-Projects-Methodological-Considerations-and-Case-Studies.pdf

[30] https://www.oecd.org/cfe/cities/Flyer-Land-Value-Capture.pdf

[31] https://www.oecd.org/cfe/cities/Flyer-Land-Value-Capture.pdf

[32] https://publications.iadb.org/publications/english/document/The-Potential-of-Land-Value-Capture-for-Financing-Urban-Projects-Methodological-Considerations-and-Case-Studies.pdf

A final example includes the **municipality of Cali** in the **State of Valle del Cauca in Colombia,** which is exploring the feasibility of LVC to support a commuter-light rail project to improve the quality of public transport across the city and beyond[33].

Box 3 Case study: LVC to part-finance London's Crossrail project[34]

London's Crossrail project is a good example of successful value capture. The project, which was announced in 2007, leveraged £6 billion of a total estimated project cost of £15.9b2 from LVC mechanisms including **higher rates, levies on new developments, sales of surplus land and direct contributions from key beneficiaries** including Heathrow Airport and Canary Wharf Group.

2.2 Innovative borrowing mechanisms

Green Bonds are **any type of bond instrument** where the proceeds or an equivalent amount will be exclusively applied to finance or re-finance, in part or in full, new and existing **projects which deliver environmental benefits and a more sustainable economy[35].** This includes renewable energy, energy efficiency, pollution prevention and control, and environmentally sustainable management of living natural resources and land use[36, 37].

The key **difference between green bonds and generic bonds** is that the funds generated from selling green bonds are specifically earmarked for environmental projects[38, 39]. As such, green bonds fall under the category of **investment-specific bonds** discussed in the previous Chapter.

2.2.1 Sovereign and municipal green bonds

Green bonds can be issued by **government entities at either the national or municipal level**.

Sovereign green bonds are debt securities issued by national governments[40]. **Poland** was the first country to issue a green sovereign bond in 2016. Since then, multiple countries across the globe have issued green sovereign bonds, including **Belgium, Chile, Fiji, France, Germany, Hungary, Hong Kong, Indonesia, Ireland, Korea, Lithuania, Nigeria, the Netherlands, the Seychelles and Sweden41.** The **UK** is planning on issuing its **first green gilt in September 2021** (see Box 4).

Municipal green bonds are used by sub-national government entities to borrow money for local green infrastructure projects[42]. The **State of California,** for example, has issued over $5bn of

[33] https://www.pwc.com/gx/en/industries/assets/pwc-increasing-private-sector-investment-into-sustainable-city-infrastructure.pdf

[34] https://www.frontier-economics.com.au/documents/2020/04/value-in-value-capture.pdf/

[35] https://www.icmagroup.org/assets/documents/Sustainable-finance/2021-updates/Green-Bond-Principles-June-2021-140621.pdf

[36] https://www.icmagroup.org/assets/documents/Sustainable-finance/2021-updates/Green-Bond-Principles-June-2021-140621.pdf

[37] https://www.pwc.co.uk/services/sustainability-climate-change/insights/green-bonds.html

[38] https://econreview.berkeley.edu/are-green-bonds-as-good-as-they-sound/

[39] https://www.aberdeenstandard.com/en/insights-thinking-aloud/article-page/green-gilts

[40] https://www.bmogam.com/gb-en/institutional/news-and-insights/uk-sovereign-green-bonds-the-investor-perspective/

[41] https://www.oecd.org/coronavirus/en/data-insights/growing-momentum-for-sovereign-green-bonds

[42] https://www.aldersgategroup.org.uk/asset/1009

municipal green bonds, including a $500m bond from the San Francisco Public Utilities Commission for clean water projects. In the **UK, local authorities (LAs)** also have the power to issue municipal bonds, and a small number of LAs have launched green municipal bonds in the last two years (see Box 8).

Green bonds can also be issued by other public sector agents such as **public utilities** or other government-owned entities. For example, a **package of green bonds has been issued in the water sector in the UK.** The first public utility to do so was Anglian Water which issued a £250m green bond in July 2017. Proceeds from the bond will finance or refinance new and existing green projects in water-preservation and supply schemes. Tideway issued a green bond in 2018 which amounted to £450m, which will form part of the financing for the construction of the Thames Tideway Tunnel.

Box 4 Case study: UK Green gilts[43]

In the UK Budget, it was announced that the Government will issue its **first sovereign green gilt** in summer 2021, with a further issuance later in 2021 as the UK looks to build out a 'green curve'. Green gilt issuance will total a **minimum of £15 billion for the financial year.**

Eligible Green expenditures can include government expenditures in the form of direct or indirect investment expenditures, subsidies, or tax foregone and selected operational expenditures[44]. Some examples of eligible green expenditures using funds from green gilts issuance include:

Clean transportation: Low and zero emission mobility or R&D for low and zero emission transportation technologies. For example, projects such as the UK Government's planned decarbonisation of the bus fleet by rolling out zero-emission buses.

Renewable energy: Support developing of renewables such as wind, solar and hydrogen, support for renewable heat use, or R&D for commercial viability of renewables. The Renewable Heat Incentive Scheme, which helps UK households, businesses and other organisations to offset the cost of installing and running renewable heat technologies, is one such example.

Energy efficiency: Support schemes for energy efficiency programmes. A pertinent example is the Public Sector Decarbonisation Scheme, which provides grants to fund heat decarbonisation.

The main advantage of borrowing via a green bond, rather than a generic bond, is the **opportunity for governments to join a bond market that is gathering momentum** and is predicted to continue it its upward trajectory.

The **sustainable bond market,** which includes all ESG (Environmental, Social and Governance) focused bonds and as such bonds that are earmarked to finance *either environmental or social* projects, **has grown considerably** in recent years. Issuances of sustainable bonds reached **record highs in 2020** with $491 billion issued[45]. Experts from Moody estimate that this will increase to $650

43 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1002578/20210630_UK_Government_Green_Financing_Framework.pdf

44 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1002578/20210630_UK_Government_Green_Financing_Framework.pdf

45 https://www.environmental-finance.com/content/the-green-bond-hub/trends-in-sustainable-bonds-issuance-and-a-look-ahead-to-2021.html

billion in 2021, a 32% increase over last year. Green bonds typically make up a large proportion of sustainable (ESG) bonds, for example, 85% and 80% of total sustainable bond issuance was achieved through green bonds in 2018 and 2019, respectively[46]. It is also precited that over 50% of the expected ESG issuance in 2021 will be comprised of green bonds[47].

The growth in the sustainable bonds market is a direct response to the **increase in investor demand in ESG investment products;** a trend which is expected to have been further catalysed by the COVID-19 pandemic[48]. As such, issuing a green rather than generic bonds not only gives the issuing entities **access to large pools of capital,** but also to capital that is provided at **lower costs of borrowing** given the high investor demand.

An additional advantage of green over generic bonds is that issuing green bonds can have an **important demonstration effect** both across the financial system and also within government. This means that sovereign bonds (along with issuance from other public bodies) can further help channel private savings to priorities that have previously been undersupplied by the market[49].

A potential challenge of issuing a green bond is that the **administrative cost of issuing green bonds is higher than the cost of generic bonds, in part** due to the requirement of a higher level of due diligence[50]. This cost may be particularly high in the issuing of a first green bond[51]. Research from GRESB found that most private issuers found that there was a significant learning curve associated with their first green bond issue[52], as initiating a green bond requires the upfront research and internal conversations about use of proceeds, accounting and auditing, and impact reporting.

Related to this, an entity wishing to issue a green needs a **large enough borrowing requirement for specifically green projects** to support the administrative fees and other costs involved[53]. Those limitations help explain why municipal green bonds remain relatively scarce, even in jurisdictions where local governments are given the authority to issue municipal bonds (e.g., UK).

The **Jersey States Assembly is currently giving consideration to the issuance of ESG bonds** in the context of obtaining funding for the Jersey hospital. The underlying business case confirms that the advantages and challenges associated with issuing ESG bonds discussed in this section are also highly relevant in the Jersey context, and concludes that the suitability of a social bond would need to balance the advantage of lower borrowing costs and higher investor demand with the total cost of establishing and operating the likely enhanced reporting requirements and the impact of potential debt covenants[54].

[46] 1] https://www.environmental-finance.com/assets/files/research/sustainable-bonds-insight-2021.pdf

[47] https://www.environmental-finance.com/content/the-green-bond-hub/trends-in-sustainable-bonds-issuance-and-a-look-ahead-to-2021.html

[48] https://www.ftadviser.com/investments/2020/12/04/meeting-the-demand-for-esg/

[49]https://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2019/09/Grantham-Research-Institute-response-to-inquiry-on-decarbonisation-of-the-UK-economy-and-green-finance.pdf

[50] https://www.intuition.com/green-bonds-are-growing-fast-but-there-are-challenges/#:~:text=The%20process%20of%20demonstrating%20their,to%20issue%20than%20traditional%20bonds.&text=Instead%2C%20green%20bonds%20typically%20trade,as%20an%20issuer's%20traditional%20bonds.

[51] https://gresb.com/green-bonds-costs-and-benefits-issuance-and-investment/

[52] https://gresb.com/green-bonds-costs-and-benefits-issuance-and-investment/

[53] https://www.local.gov.uk/financing-green-ambitions-full-report

[54] https://statesassembly.gov.je/assemblypropositions/2021/p.80-2021%20(re-issue).pdf

2.2.2 Green savings bonds

The UK government has announced that it will launch the **world's first green retail savings product,** the Green Savings Bond, via National Savings and Investment (NS&I) in 2021. The green savings bonds will be sold in the form of **three-year fixed bonds** with interest being paid annually[55].

The money invested in green savings bonds will go to HM Treasury and be held in a general account, from which funds will be allocated to chosen green projects within two years[56]. The Government will use the money that UK savers put into these bonds for **financing green infrastructure projects** such as building offshore wind farms and financing the transition to electric vehicles.

The bonds are operated by National Savings and Investment and therefore carry **zero risk to UK savers.** In particular, payments are not reliant on the success of the funded green infrastructure projects.

2.3 Innovative ways of encouraging private investment

While public budgets have traditionally been the most important source of green infrastructure financing[57], **large-scale private investment will be needed** to bridge the infrastructure investment gap to support the transition to a green economy[5859]. **Catalysing and mobilising private finance** and investment in support of green growth[60] is therefore an important mechanism for governments to fund their decarbonisation agendas.

Encouraging private investment can involve either **direct use of public funds (through e.g., kickstart funding provided by targeted funds or match-funding schemes)** or the **backing of a project** with public funds (through **guarantees and insurance)**. Moreover, a wider pool of private investors can be mobilised through use or support of **third-party crowdfunding platforms or voluntary or compliance carbon offsetting schemes.** Some specific mechanisms that have been used by governments to encourage private investment in other jurisdictions are discussed in the following sub-sections.

2.3.1 Guarantees, insurance and other forms of de-risking

One reason for the current investment gap is that **certain green projects may carry significant risks.** For this reason, governments may need to deploy risk mitigating solutions to mobilise private investment into these projects[61]. Public de-risking strengthens the financial viability of projects by

[55] https://www.moneysavingexpert.com/savings/green-savings-bond/

[56] https://www.nsandi.com/green-saving

[57] OECD (2020) Green Infrastructure in the Decade for Delivery: Assessing Institutional Investment, Green Finance and Investment, OECD Publishing, Paris, https://dx.doi.org/10.1787/f51f9256-en.

[58]https://www.oecd-ilibrary.org/docserver/357c027e-en.pdf?expires=1626276315&id=id&accname=guest&checksum=FE47F0F8DB9F2876C8383E9A14B311AF

[59]https://openknowledge.worldbank.org/bitstream/handle/10986/35203/Enabling-Private-Investment-in-Climate-Adaptation-and-Resilience-Current-Status-Barriers-to-Investment-and-Blueprint-for-Action.pdf?sequence=5.

[60] OECD (2020) Green Infrastructure in the Decade for Delivery: Assessing Institutional Investment, Green Finance and Investment, OECD Publishing, Paris, https://dx.doi.org/10.1787/f51f9256-en.

[61]https://www.oecd-ilibrary.org/docserver/357c027e-en.pdf?expires=1626276315&id=id&accname=guest&checksum=FE47F0F8DB9F2876C8383E9A14B311AF

transferring the extra risk to the public sector, thus **improving the risk-return profile of specific climate-related projects[62].**

Government guarantees against potential loss are a direct way of reducing the risk for private investors.

HM Treasury launched the **UK Guarantees Scheme (UKGS)** in 2012 with the aim of guaranteeing 'nationally significant' infrastructure projects[63]. It works by offering a government-backed guarantee to help infrastructure projects access debt finance where they have been unable to raise finance in the financial markets. The Scheme has since moved to the UK Infrastructure Bank in 2021 with a focus on tackling climate change and levelling up[64]. The UKIB will have an initial £12 billion of capital to deploy and will be able to issue £10 billion of government guarantees, helping to unlock more than £40 billion of overall investment.

Government guarantees can also be built into **contractual arrangements,** which can allow contracting companies to limit losses and mitigate commercial risk[65]. For example, **Demand Assurance guarantees** can be applied to heat networks to overcome the issue of customers not signing up until there are heat networks, and investors not creating heat networks until there are customers. Demand Assurance can also ensure network operators can receive revenue in the event of temporarily reduced demand.

The **Thames Tunnel Tideway project** described in the box below is an example of a targeted, multi-pronged de-risking by the British Government to mobilise private investment[66].

Box 5 Case study: Use of guarantees and regulation to de-risk the Thames Tunnel Tideway project

The Thames Tunnel Tideway project is a 25-kilometre sewage tunnel constructed 65 meters under the Thames to prevent sewage discharge into the Thames and improve water quality. The project license was given to Bazalgette Tunnel Limited as the "infrastructure provider"[67], a consortium carried out by a number of private capital investors, with initial debt provided by a syndicate of six banks[68].

In order to incentivise investment, the UK Department of Environment, Food and Rural Affairs (DEFRA) provided the private investors with a **financial support package** made up of several **guarantees to support the investors in the event of low-probability but high-impact risks[69].**

[62] https://www.oecd.org/env/researchcollaborative/WEB%20private-finance-for-climate-action-policy-perspectives.pdf

[63] https://www.aldersgategroup.org.uk/asset/1009

[64] https://www.gov.uk/government/news/uk-infrastructure-bank-opens-for-business

[65] https://www.aldersgategroup.org.uk/asset/1009

[66]https://www.oecd-ilibrary.org/docserver/357c027e-en.pdf?expires=1626276315&id=id&accname=guest&checksum=FE47F0F8DB9F2876C8383E9A14B311AF

[67] https://www.ashurst.com/en/news-and-insights/legal-updates/uk-infrastructure-innovations-in-government-support/

[68]https://www.oecd-ilibrary.org/docserver/357c027e-en.pdf?expires=1627381594&id=id&accname=guest&checksum=4824DFCD2AA977080AAC43F992A375B2

[69] https://www.ashurst.com/en/news-and-insights/legal-updates/uk-infrastructure-innovations-in-government-support/

These guarantees include the agreement to provide **temporary liquidity** in the case the infrastructure provider is unable to raise debt from the markets due to an economic or political disruption, and an **agreement to infuse additional equity** in the event of cost overruns. While the project will continue to have the obligation to raise finance, existing shareholders will not be obliged to provide such additional finance. Agreements were also made to **make an offer for equity or debt issued by the infrastructure provides in the case of insolvency** and **providing compensation to equity and debt providers in the event of project termination**[7071]**.**

In addition to these guarantees, the UK government implemented **customised regulations to allow the project to generate revenues from the beginning of construction.** The revenue stream is made up of bill payments from 15 million Thames Water consumers, who will be charged no more than £25 per year extra[72]. By creating this stream of payments during the early stages of the project, the UK Government increased the economic attractiveness of the project as usually revenues are not generated until infrastructure is operational.

While the mechanisms described in this section could be key tools to raising the private capital that is required to plug the shortfall in financing decarbonisation, all of those mechanisms principally involve the **reallocation of risk from private investors to the government.** These risks can last for many years, and Government may incur unforeseen costs related to these commitments during challenging times for public expenditures. Furthermore, reducing the risk for private companies might create a **moral hazard issue,** where the private party has less to lose from poor performance or management than the Government.

2.3.2 Match-funding

Another innovative tool for **leveraging private capital and encouraging investment** in green projects is 'match-funding'.

Under a match-funding scheme, the government agrees to **pay a fixed proportion of the funds made available by private investors.** Match-funding increases the likelihood of a project achieving its full funding requirements as it creates a larger pool of funding, and so enhances the overall probability of success of the project. This implies that match-funding potentially carries **less long-term risks than commitments to de-risking mechanisms** such as those discussed in the previous section.

The box below provides an example of how match-funding is used by the UK government to draw private funds to local heat network systems.

Box 6 Case study: Heat Networks Investment Project (HNIP), UK

A **heat network** is a system for distributing heat that is generated in a centralised location via a network of underground pipes[73]. A heat network can supply multiple buildings with heat and remove the need for individual boilers or electric heaters. Heat networks can therefore leverage

[70] https://www.ashurst.com/en/news-and-insights/legal-updates/uk-infrastructure-innovations-in-government-support/

[71]https://www.oecd-ilibrary.org/docserver/357c027e-en.pdf?expires=1627381594&id=id&accname=guest&checksum=4824DFCD2AA977080AAC43F992A375B2

[72] https://www.tideway.london/about-us/

[73] hnip-launch.pdf (publishing.service.gov.uk)

economies of scale and reduce energy wastage, as well as reduce energy bills for households and businesses.

The UK **Heat Networks Investment Project (HNIP)** was launched by the Department for Business, Energy and Industrial Strategy (BEIS) in 2018 as part of the UK Government's decarbonisation agenda. The project will **invest up to £320 million of capital funding to fund heat network projects across England and Wales[74],** awarding funding of **up to 50% of the total capital expenditure required** for the construction of heat networks.

The longer-term objective of HNIP is to help create a **self-sustaining heat networks market that will operate without direct government subsidy,** eventually[75]. This will be achieved by increasing the volume and improving the quality of heat network infrastructure and building capability of project sponsors and supply chain participants, over the project duration. Three funding mechanisms are offered by Government: **grants, corporate loans, and project loans.** Grants are provided at a competitive level based on the application process. Corporate and project loans are lent to credit worthy project sponsor organisations. The interest rate on the loans are regulated by EU State Aid rules and offer more favourable terms that those generally available in the market. The project loan also has the additional feature that in the event consumers fail to materialise and the business' cash flow suffers, a grace period for repayment can be granted for up to 3 years.

The scheme has so far provided **over £85 million[76].** HNIP is set to be replaced in April 2022 by the Green Heat Network Fund (GHNF), with the aim to transition the scheme to a capital grant fund only[77].

2.3.3 Green crowdfunding and community-financing

Crowdfunding is a process by which a project or organisation receives funding by **raising small amounts of money from a large number of people**. The (many) investors either receive a return that is financial (investment based), or non-financial (donation based)[78]. Moreover, crowd-funding can be equity-based or debt-based[79], whereby equity-based crowdfunding is mostly used by start-ups.

Crowdfunding is traditionally facilitated through online platforms. In the UK, Abundance Investment is a commonly used online crowdfunding site which focuses on providing short- and long-term debt to infrastructure companies and public sector organisations[80]. Box 7 below provides an example of how an online crowdfunding platform is supporting green projects in the Netherlands.

[74] Heat Networks Investment Project (HNIP): overview and how to apply - GOV.UK (www.gov.uk)

75 hnip-launch.pdf (publishing.service.gov.uk)

[76] This figure is based on the projects listed by Triple Point Heat Networks Investment Management who state that this list is not exhaustive, so this figure is a conservative estimate.

[77] Green Heat Network Fund (GHNF) Transition Scheme - GOV.UK (www.gov.uk)

[78] https://www.local.gov.uk/financing-green-ambitions-full-report

[79]https://ec.europa.eu/energy/sites/default/files/documents/building_the_investment_community_-_d1_improving_the_investment_community_revised_final_draft.pdf

[80] https://www.abundanceinvestment.com/how-it-works

Box 7 Case study: Online crowdfunding platform to support sustainable energy generation and supply projects in the Netherlands

Greencrowd is a Dutch crowdfunding platform for **sustainable energy generation and supply** with over 1,000 registered crowdfunders and 35 projects[81]. Funding targets tend to range from as low as **EUR 3,000 to EUR 700,000.** Greencrowd's focus is primarily on renewable energy technologies, but the platform has also supported energy storage and wastewater management projects. The platform supports both debt- and donation-based financing for energy projects.

To be listed on the online platform, **project owners have to present adequate securities.** Greencrowd then conducts risk assessments, analysis and due diligence and rates the project on a scale from A+ to F. Greencrowd publishes the analysis and risk assessment when the project is open for funding and markets the projects through newsletters and social media. Once the pledged amount of funds are reached, contributions are accrued by Greencrowd and are lent to the contractor who executes the project. When the contractor is paid by the project investor, **part of the payment accrues back to Greencrowd and is used to redeem crowdfunders' loans and pay interest.**

A **community municipal bond** is a new model of public sector crowdfunding which can provide low-cost capital for local municipalities to deliver positive social and environmental outcomes[82]. This type of crowdfunding is being used by several local authorities in the UK, as described in the Box below.

Box 8 Case study: Community municipal bonds as a new means of crowdfunding used by UK local authorities

West Berkshire Council was the first local authority in England to launch a Community Municipal Investment (CMI) bond in 2019. The Council was looking **to raise £1 million to install solar panels on Council-owned buildings** to help reach their district-wide carbon neutral target by 2030. The bond was issued by an online crowdfunding platform, Abundance Investment. The bond offered returns of 1.2% a year over a 5-year period, attracting 640 investors who invested an average of £1,500 each within 5 days[83].

Warrington Borough Council also launched a CMI bond in August 2020 to raise £1 million to finance the **construction of a solar farm and battery storage facility.** The bond offered the same returns as West Berkshire Council's, similarly, attracting over 500 investors who invested an average of £2,000 each. The bond aimed to be accessible to most with a minimum investment of just £5[84].

Research suggests that crowdfunding in general and community municipal bonds in particular have several potential benefits beyond the raising of capital to finance socially and environmentally sustainable projects. On the issuer side, one advantage is that crowdfunding can direct project money to smaller firms and projects that might **not have access to traditional funds** such as bank loans[85]. Crowdfunding and especially community municipal bonds moreover offer a new channel to

[81] https://ec.europa.eu/energy/sites/default/files/documents/building_the_investment_community_-_d1_improving_the_investment_community_revised_final_draft.pdf

[82] https://www.local.gov.uk/financing-green-ambitions-full-report#debt

[83] https://www.local.gov.uk/financing-green-ambitions-full-report#debt

[84] https://www.local.gov.uk/financing-green-ambitions-full-report#debt

[85] https://cordis.europa.eu/article/id/136115-green-crowdfunding-disruption-or-opportunity/it

engage local communities, increase awareness, and foster support for sustainable activities[86]. Crowdfunding also allows **greater transparency and hypothecation of investment** capital inflows, contributing to **building trust** in the local community. Finally, crowdfunding can generate additional economic benefits as returns on capital earned by individuals can be re-directed to spend in the local or national economy.

There are **potential barriers** to the use of public sector crowdfunding to finance green projects. Firstly, there is a **lack of knowledge and expertise** in the public sector in regard to crowdfunding as an investment model, which might ultimately affect potential investors' if? investment risks are not fully understood and communicated[87]. There are also potential concerns around **the impact of an increased use of crowd-funding on other traditional funding mechanisms** including the impact on charitable donations.

Box 9 Case study: Community financing in Wales to fund green projects

Community Energy Finance is a trading body in Wales that was set up to support community groups working on energy projects. Examples of projects supported by the Community Energy Finance body include:

Ynni Ogwen Cyf[88]: Ynni Ogwen Cyf is a community benefit company with the principal objective of producing renewable energy, specifically hydroelectric energy, from Afon Ogwen, a river in north-west Wales. Ynni Ogwen Cyf set up a Shares Scheme which invited people to purchase shares in the hydroelectric power system and they would in turn receive dividends. Within two months they raised £459,000, 85% of which was made up of contributions from the local community. The energy produced was sold to the local community at a discounted rate.

Awel Co-op[89]: Awel Co-op commissioned a 4.7MW wind farm to be built in 2017. In one year, the project generated energy at a rate ahead of its target, supplied the annual electricity needs of over 3,000 homes and saved 3,300 tonnes of carbon emissions. Awel Co-op raised £2.7 million from its community share offer by the end of 2017 and was co-funded by a £5.25 million loan from a private bank. Co-op members received interest payments of 7% annually. Not only was the project successful in its production of renewable energy, but the Co-op also used profits to support local charities in tackling fuel poverty and investing in climate change-related educational and arts programmes.

2.3.4 Carbon offset markets

Another way for governments to encourage private investment in environmental projects is through the setup and facilitation of **either mandatory of voluntary carbon offset markets.**

Carbon offsetting is a market-based mechanism that **allows individuals, businesses, and organisations to offset their carbon emissions by investing in environmental projects.** While there

[86] Davis, M. and Cartwright, L. (2019) Financing for Society: Assessing the Suitability of Crowdfunding for the Public Sector. University of Leeds Available at: https://baumaninstitute.leeds.ac.uk/wp-content/uploads/sites/134/2019/04/FinancingForSociety-Extended-Summary.pdf

[87] Davis, M. and Cartwright, L. (2019) Financing for Society: Assessing the Suitability of Crowdfunding for the Public Sector. University of Leeds Available at: https://baumaninstitute.leeds.ac.uk/wp-content/uploads/sites/134/2019/04/FinancingForSociety-Extended-Summary.pdf

[88] https://www.partneriaethogwen.cymru/en/other-projects/sustainability/ynni-ogwen/

[89] http://awel.coop/wp-content/uploads/2018/06/AwelCo-opAccounts2017.pdf

is no unified definition, carbon offsetting is broadly defined as "the practice of reducing or removing greenhouse gas emissions to balance ongoing greenhouse gas emissions, in order to achieve claims such as climate neutrality or net zero"[90]. This might include investing in renewable energy or energy efficiency projects, or the afforestation and conservation of land.

Carbon credits are purchased from **third-party certified projects** that aim to reduce, avoid, or capture carbon emissions. Carbon credits are usually issued by a verifying agency who independently assess the capacity of the project to reduce emissions. For example, the OECD offset 100% of their greenhouse gas emissions in 2020 by financing the Gola Rainforest Project in Sierra Leone which reduces global emissions by 500,000 tonnes annually[91]. In 2018, Apple invested an undisclosed sum in a project in Columbia to restore mangroves and sequester over 18,000 tonnes of carbon dioxide over two years, an amount equal to the emissions produced by the fleet of vehicles updating Apple Maps over the next decade[92].

Individuals or organisations might **offset their entire estimated carbon footprint or offset specific activities.** For example, one of the earliest voluntary offset markets is in aviation. However, while aviation offsetting has been available for around a decade, only 10% of people choose to offset their flight[9394]. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) was developed by the International Civil Aviation Organisation to lower carbon emissions from international flights. The Scheme uses market-based instruments in the form of carbon credits which are to be purchased from the carbon market. As of 2018, over 70 countries have volunteered to participate.

Box 10 Case study: Use of carbon offset payments and match-funding by the Camden Climate Fund[95]

The Camden Council in Greater London set up the Camden Climate Fund which is financed through carbon offset payments[96]. All major developments must comply with the Mayor's London Plan which includes increasingly stringent carbon reduction targets. In the event developments fall short of their targets, developers must pay a cash-in-lieu contribution to the Local Planning Authority (LPA) as compensation. These contributions make up carbon offset funds that can go to fund carbon reduction projects across London. In Camden, grants are available for households, businesses, and community groups, up to £7,500, £5,000, and £15,000, respectively, for installing renewable energy system and making energy efficient improvements. Applicants for the grant are required to match fund 50% of the cost of the project up to the amount of the maximum grant.

[90] https://assets.publishing.service.gov.uk/media/60cc698cd3bf7f4bcb0efe02/Achieving_net_zero_-_a_review_of_the_evidence_behind_carbon_offsetting_-_report.pdf

[91] https://greening.oecd.org/EXT_Greening%20report%202020.pdf

[92] https://qz.com/1391782/apple-investing-in-negative-emissions-via-mangrove-restoration/

[93] Ritchie, B., Sie, L., Gössling, S. & Dwyer, L. (2019) Effects of climate change policies on aviation carbon offsetting: a three-year panel study, Journal of Sustainable Tourism, 28(2)

[94] Ritchie, B., Kemperman, A. & Dolnicar, S. (2021) Which types of product attributes lead to aviation voluntary carbon offsetting among air passengers?, Tourism Management, Volume 85

[95] https://www.london.gov.uk/sites/default/files/carbon_offsett_funds_guidance_2018.pdf

[96] https://www.london.gov.uk/sites/default/files/carbon_offsett_funds_guidance_2018.pdf

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