



Irish Sovereign Green Bond

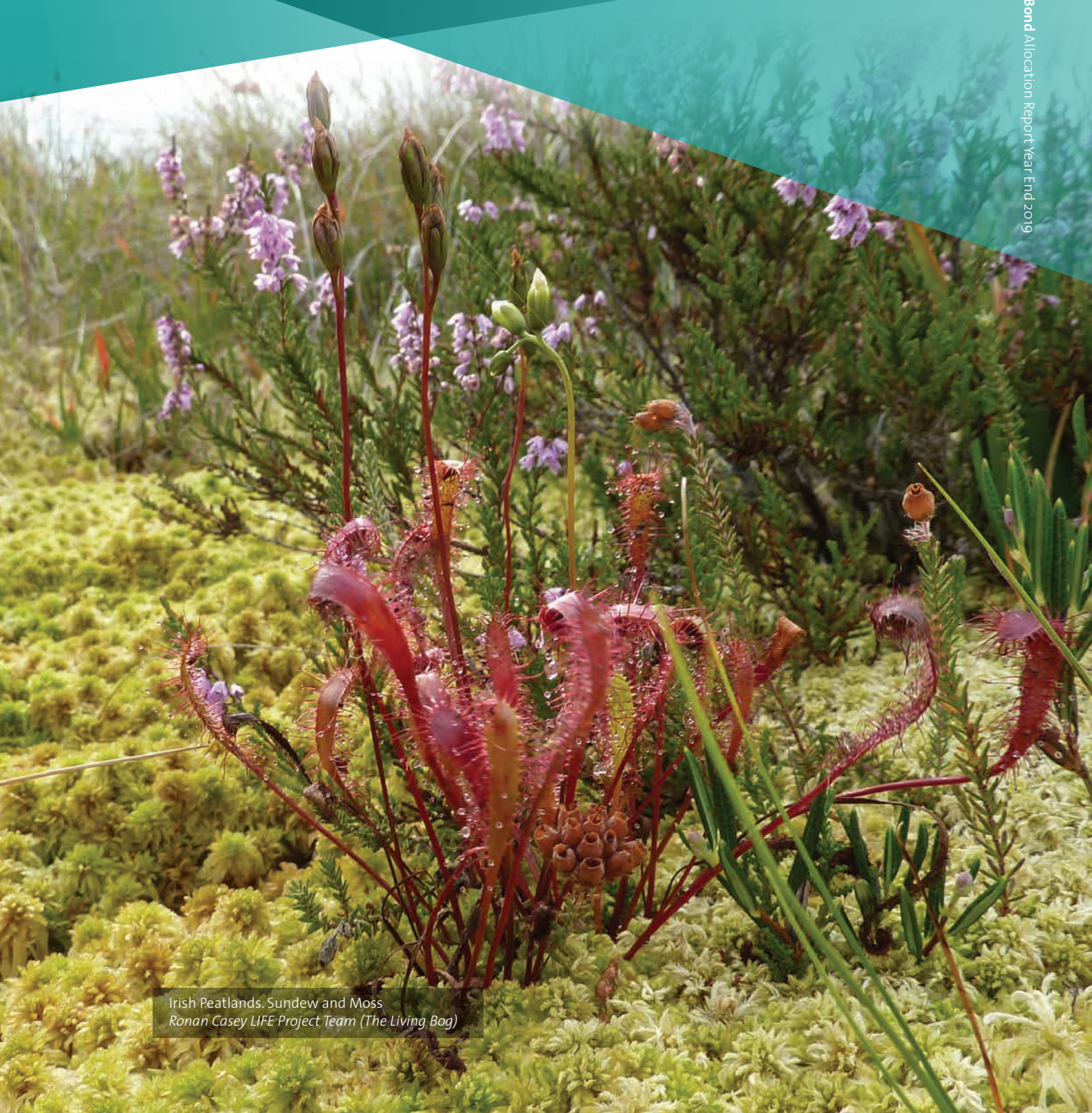
Allocation Report Year End 2019



Rialtas na hÉireann
Government of Ireland

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Irish Peatlands. Sundew and Moss
Ronan Casey LIFE Project Team (The Living Bog)

Introduction and summary

This is the second annual allocation report issued in accordance with the [Irish Sovereign Green Bonds \(“ISGB”\) Framework](#).

In October 2019, the NTMA undertook a €2 billion syndicated tap of Ireland’s sovereign Green Bond. This increased the amount outstanding to €5 billion, building on the inaugural issue of €3 billion in 2018.

Irish Sovereign Green Bonds (ISGBs) are designed to provide investors with the financial features of a standard Irish Government Bond combined with sovereign green bond market practices. ISGB proceeds are paid into the Central Fund as with standard Government bonds. Amounts raised on foot of ISGBs are allocated against Eligible Green Projects that generate a positive environmental benefit.

The first annual allocation report, for the year ended 2018, was published in June 2019. This outlined the funding amounts allocated to Eligible Green Projects (see Appendix 1). Overall, €1,949 million was allocated to Eligible Green Projects from the total proceeds of €2,983 million outstanding at end-2018. This left an unallocated amount of €1,034 million at the start of 2019 for allocation thereafter. Subsequently, the syndicated tap in October 2019 brought the total available for allocation to €3,293 million.

This Report outlines how the allocations were made in 2019 across the six eligible green categories set out in the ISGB Framework:

- Built Environment/Energy Efficiency
- Clean Transportation
- Climate Change Adaptation
- Environmentally Sustainable Management of Living Natural Resources and Land Use
- Renewable Energy
- Sustainable Water and Wastewater Management

€1,969 million was allocated to the eligible green categories from the proceeds on hand of €3,293 million at the end of 2019. The remaining proceeds of €1,324 million will be available for allocation to the year 2020.

Table: ISGB proceeds raised and allocated

	€
Total Proceeds from ISGB inaugural syndicated sale October 2018	2,983,410,000
Amount available for allocation as at year end 2018	2,983,410,000
Proceeds allocated 31st December 2018	-1,949,048,618
Unallocated Proceeds 1st January 2019	1,034,361,382
Total Proceeds from ISGB syndicated tap sale October 2019	2,258,380,000
Proceeds available for allocation as at year end 2019	3,292,741,382
Allocated Proceeds 31st December 2019	-1,969,037,000
Unallocated Proceeds 1st January 2020	1,323,704,382

Figure 1: ISGB proceeds and total allocation €million

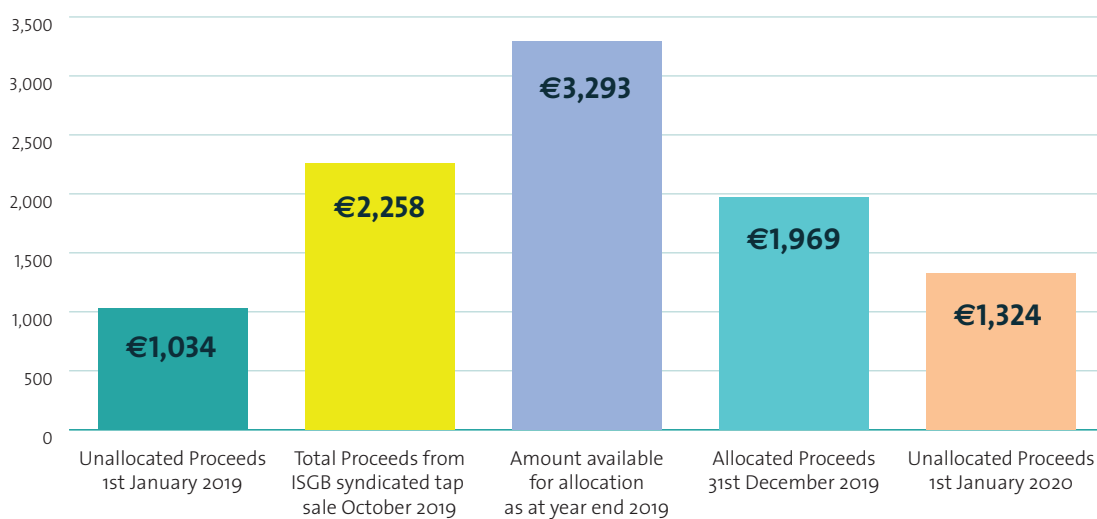
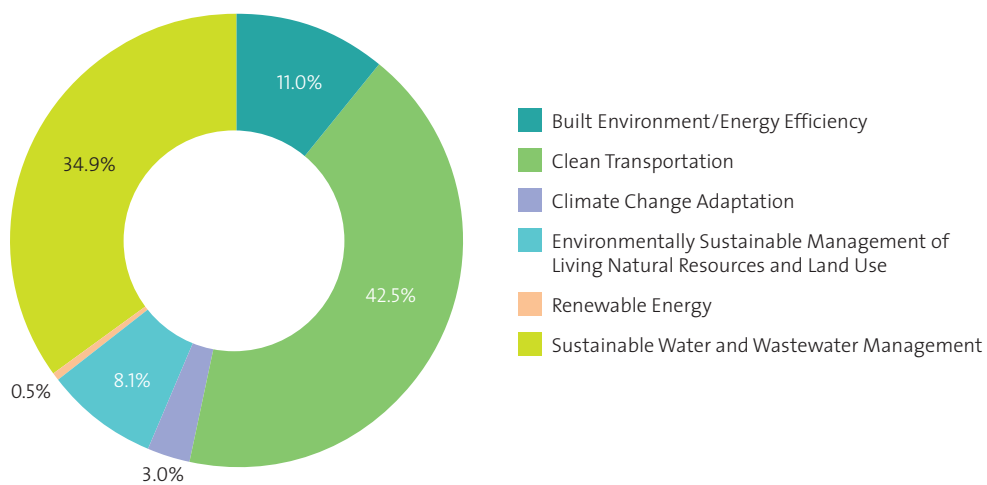


Figure 2: Percentage allocation per eligible green category



Governance and Project Selection

The ISGB Working Group oversees the implementation of the ISGB Framework, including reporting on the allocation of proceeds to Eligible Green Projects. It is comprised of representatives from the National Treasury Management Agency, the Department of Public Expenditure and Reform, the Department of Communications, Climate Action and Environment and the Department of Finance.

The Working Group consulted with other Government departments and State Agencies in carrying out its remit. This includes the identification of eligible green projects which are evaluated and selected for allocation under the ISGB Framework based on the use of proceeds criteria. These projects are, where relevant, in line with those identified by the Department of Public Expenditure and Reform in the Revised Estimates for Public Expenditure – see Appendix 10 of the [2020 publication](#) for more details.

The objective is to finance, or refinance, eligible green projects with the following parameters:

- which promote, in whole or in part and whether directly or indirectly, Ireland’s transition to a low carbon, climate-resilient and environmentally sustainable economy;
- which are funded, in whole or in part and whether directly or indirectly, through Exchequer funded expenditures, subsidies or tax foregone;
- where the relevant Exchequer expenditure has been provided within the 24 month period preceding the issue date of the relevant ISGB to refinance an existing project; and which otherwise qualify under the Framework.

Acknowledgements

This Report was produced with the co-operation of Government departments and other State bodies¹ responsible for expenditure and subsidies which are allocated from the proceeds of ISGBs. The ISGB Working Group is grateful to the many colleagues who provided information and assistance especially with the difficult backdrop of the Covid-19 crisis in the run-up to production of this Report.

Those Government departments and State bodies are as follows:

- [Department of Finance](#)
- [Department of Public Expenditure and Reform](#)
- [Department of Housing, Planning and Local Government](#)
- [Department of Transport, Tourism and Sport](#)
- [Department of Culture, Heritage and the Gaeltacht](#)
- [Department of Agriculture, Food and the Marine](#)
- [Department of Communications, Climate Action and Environment](#)
- [Office of Public Works](#)
- [National Treasury Management Agency](#)

The Working Group would also like to acknowledge the kind assistance of [Irish Water](#) and [Iarnród Éireann](#) with additional material for assistance with the material in the two case studies.

¹ Government Departments and State bodies referenced in this report are as they were organised in June 2020 when this report was drafted.

Allocation Table and Analysis for the year ended 2019

The table of expenditure on Eligible Green Projects is assembled as follows:

- **Eligible Green Categories:** Projects/Programmes/Schemes are aligned with the six eligible green categories as set out in the ISGB Framework.
- **Notes:** Project/Programme/Scheme explanatory notes.
- **Project/Programme/Scheme:** These have been identified by the ISGB Working Group.
- **2019 Expenditure:** All expenditure numbers can generally be traced to the Department of Public Expenditure and Reform's [databank](#) on its website, on the table *net expenditure analysis by vote*. The expenditure numbers for 2019 used in this report are based on a provisional outturn provided by the Department of Public Expenditure and Reform in its databank in March 2020 and will be subject to finalization later in 2020 in the 2019 Appropriation Accounts. Any adjustments will be reported in the third allocation report to be published in 2021. When this process is applied to the 2018 allocation report, some €23.9 million of additional expenditure in eligible green categories is carried into the allocations to 2019.
- **Allocation from ISGB Proceeds:** The amount allocated to each Project/Programme/Scheme is shown and is sub-totalled by eligible green category.
- **In total:** €1,969 million was allocated to Eligible Green Projects from the total proceeds of €3,293 million outstanding at end-2019, or 59.8%. The unallocated amount of €1,324 million at year end 2019 is available for allocation in 2020.

Table 1: Allocation Table²

Eligible Green Categories	Note	Project/Programme/Scheme	2019 Green Expenditure (€m)	2019 Allocation (A)	2018 Green Expenditure (Appropriation Accounts)	Adjustment to 2018 Allocation (B)	ISGB Proceeds Allocation (A+B)
Built Environment/Energy Efficiency Total			216.0	216.0	185.6	0.0	216.0
Built Environment/Energy Efficiency	1	Sustainable energy programmes	151.2	151.2	127.8	0.0	151.2
	2	SEAI admin and general expenses	17.4	17.4	11.0	0.0	17.4
	3	Estate regeneration – social housing improvements	47.5	47.5	46.8	0.0	47.5
Clean Transportation Total			839.1	839.1	736.0	-2.3	836.8
Clean Transportation	4	Carbon reduction	3.7	3.7	0.7	0.0	3.7
	5	Low Emission Vehicle Incentivisation (Tax foregone)	45.3	45.3	27.9	0.0	45.3
	6	Public service provision payments	307.9	307.9	295.6	-0.3	307.7
	7	Public and sustainable transport investment programme	472.4	472.4	408.6	-2.7	469.7
	8	Greenways	9.8	9.8	3.3	0.7	10.5
Climate Change Adaptation Total			58.3	58.3	64.6	0.0	58.3
Climate Change Adaptation	9	Flood Risk Management	58.3	58.3	64.6	0.0	58.3
Environmentally Sustainable Management of Living Natural Resources and Land Use Total			134.2	134.2	159.1	26.2	160.4

² Figures may not total due to rounding.

Eligible Green Categories	Note	Project/Programme/Scheme	2019 Green Expenditure (€m)	2019 Allocation (A)	2018 Green Expenditure (Appropriation Accounts)	Adjustment to 2018 Allocation (B)	ISGB Proceeds Allocation (A+B)
Environmentally Sustainable Management of Living Natural Resources and Land Use	10	Forestry and bioenergy	68.5	68.5	94.5	23.8	92.3
	11	Environmental Protection Agency	38.8	38.8	35.3	2.6	41.4
	12	International Climate Change Commitments	2.5	2.5	4.5	0.0	2.5
	13	Landfill remediation	7.0	7.0	10.3	0.0	7.0
	n/a	Climate Initiatives - Technical Research And Modelling	0.0	0.0	0.0	-0.2	-0.2
	14	National heritage (NPWS)	13.5	13.5	14.0	0.0	13.5
	15	Peatlands restoration and management	4.0	4.0	0.6	0.0	4.0
Renewable Energy Total			10.3	10.3	8.4	0.0	10.3
Renewable Energy	16	Energy research programmes	10.3	10.3	8.4	0.0	10.3
Sustainable Water and Wastewater Management Total			687.1	687.1	539.1	0.0	687.1
Sustainable Water and Wastewater Management	17	Rural water programme	41.1	41.1	39.1	0.0	41.1
	18	Irish Water Capital Expenditure	646.0	646.0	500.0	0.0	646.0
Grand Total expenditure and allocations			1,945.1	1,945.1	1,692.9	23.9	1,969.0

Notes to the Allocation Table

Built Environment/Energy Efficiency

Note 1: Sustainable Energy Programmes

These support a number of energy efficiency grant programmes to assist homes, farms, businesses and communities to reduce their energy usage. These programmes include the following:

- **Better Energy Homes:** provides grant aid to private homeowners to reduce energy use, and greenhouse gas emissions while improving the comfort levels within their home and making significant savings on energy costs. It is the most popular scheme in terms of number of individual properties having undergone some form of state funded refurbishment work. The incentive is in the form of a cash grant available to eligible applicants for undertaking eligible types of works, incl. attic and wall insulation, solar thermal, heat pump systems and others. Between 2017 and 2019, the scheme has co-financed 106,125 energy efficiency measures in 47,385 homes.
- **Better Energy Warmer Homes:** delivers a range of energy efficiency measures free of charge to low income homeowners vulnerable to energy poverty. To date, over 140,000 homes have received free upgrades under the scheme leaving the occupants better able to afford to heat their homes to an adequate level. In 2018, the measures carried out under the Better Energy Warmer Homes Scheme were expanded to include internal and external wall insulation along with attic insulation, draught-proofing, lagging jackets, low-energy light bulbs, cavity wall insulation and energy advice. In certain circumstances, the Scheme may cover heating upgrades and replacement windows subject to survey by Sustainable Energy Authority of Ireland (SEAI). Between 2017 and 2019, the scheme provided energy efficiency improvements to 15,045 homes.
- **Better Energy Communities:** encourages and supports community-based partnerships to improve the energy efficiency of the building stock in homes, schools, public and community and business buildings, and energy poor homes. It uses community networks in order to engage more stakeholders to deliver energy upgrades. It seeks to encourage the implementation of more comprehensive, and more technically and economically challenging energy efficiency measures. Partnerships can be between the public and private sectors, domestic and non-domestic sectors, commercial and not-for-profit organisations and energy suppliers. The community and business supports leverage considerable additional private investment.
- **Warmth and Wellbeing Pilot Scheme:** provides energy efficiency improvements to the homes of older people and children suffering from chronic respiratory conditions. This is a joint policy initiative between Department of Communications, Climate Action and the Environment and the Department of Health and is delivered by the SEAI and the Health Service Executive (HSE). This pilot scheme provides free energy efficiency upgrades to eligible homes, to make them warmer and more comfortable, especially during colder months. Between 2017 and 2019, 1,155 homes have benefitted from support under the scheme.
- **Deep Retrofit Pilot:** launched in 2017 as a time-bound pilot to investigate the challenges and opportunities of deep retrofit in Ireland. The scheme was intended to run for 3 years and closed for applications in 2019. A summary of important lessons and key findings which inform the approach to a large scale retrofit of Irish housing stock is available [at this link](#).
- **SEAI Vehicle Grant Scheme:** The Electric Vehicle Grant Scheme was introduced in April 2011 to incentivise and support the early deployment of EVs in Ireland. Grants of up to €5,000 are available. These grants are in addition to the Vehicle Registration Tax reliefs of up to €5,000 which apply to EVs (Electric vehicles tax incentives are described in Note 5).

- **SEAI Vehicle home Charger Grant Scheme:** introduced to assist homeowners install an electric vehicle charge point on their property. It commenced in 2018 and will provide a grant up to the value of €600 towards the purchase and installation of a home charger unit. The applicant must be the owner of an eligible new or second hand electric vehicle.

Note 2: SEAI admin and general expenses

This funding is provided to support the operation of the SEAI. It undertakes a wide variety of tasks including the administration of and operation of energy efficiency grant schemes, public education programmes on sustainability and climate change and the provision of policy advisory and technical support roles for energy policy development and delivery.

The SEAI is the official source of energy data for Ireland. It develops and maintains comprehensive national and sectoral statistics for energy production, transformation and end-use. These data are a vital input for international reporting obligations, for advising policymakers and informing investment decisions. The SEAI also publishes extensive reports on energy production and consumption in Ireland, renewable energy and energy use in the residential sector.

Note 3: Estate regeneration – social housing improvement

The Social Housing Capital Investment Programme spans a range of Exchequer and local authority funded Programmes and initiatives designed to maintain and improve the local authority housing stock of approximately 130,000 units.

A portion of the funds allocated to these schemes is dedicated to an ambitious estate regeneration programme which provides energy efficiency works to housing stock in need of remedial works. These include:

The energy efficiency/retrofitting programme – ensures that the stock of local authority-owned dwellings is maintained to a high standard, achieves an improved level of energy performance, reduces emissions and yields an important fuel poverty dividend for low income households.

The voids programme - to return vacant social housing to productive use. It places a strong emphasis on insulation retrofitting and the improvement of energy efficiency, making a significant contribution to Ireland's carbon emissions reduction targets and energy reduction targets. It is faster to bring a vacant house back into use than it is to build a new one. The benefits include lower energy costs for the tenant. Almost 12,500 social homes have been brought back to use in the period 2014-2019.

The Limerick Thermal Upgrade Programme - implemented under the Limerick Regeneration Framework Implementation Plan and will include works to 1,400 houses when completed. The 2013 Limerick Regeneration Framework Implementation Plan provides a roadmap for the programme which will see some 600 new social homes delivered, as well as the refurbishment of over 1,400 existing social and private homes. A rolling programme of thermal upgrades and environmental improvements to existing homes is underway with the main aim to achieve a C1 rating. Over 1,000 houses have been upgraded, with approximately a further 500 on site or in preparation. The bulk of the houses were built between the 1930s and early 1980s. These property improvements have a real impact on the comfort levels of residents, while also improving the physical environment and appearance of the areas.

Clean Transportation

Note 4: Carbon Reduction

This includes expenditure on Department of Transport, Tourism and Sport Schemes. Firstly, the Electric Small Public Service Vehicle (eSPSV) Grant Scheme (i.e. taxi/hackney/limousine) which provides grants of €7,000 for the purchase of battery electric vehicles (BEVs) and up to €3,500 for plug in hybrid vehicles (PHEVs), as well as an additional €2,500 for the conversion of an eSPSV into a wheelchair accessible vehicle. It also includes, the Low Emission Vehicle Toll Incentive Scheme which offers discounts of up to 50% off toll rates for BEVs and alternatively fuelled heavy duty vehicles (HDVs), such as gas, hydrogen or electric trucks or buses/coaches, as well as a 25% toll discount for PHEVs. Greater off-peak rates also apply to the M50 motorway toll, which serves the Dublin area, for all eligible vehicles.

In addition, the Carbon Reduction Programme provides funding towards the cost differential for pilots and trials of low emission technology in the Public Service Obligation sector (such as the Low Emission Bus Trial and the purchase of pilot hybrid and hydrogen public buses). It also supports research into additional carbon reduction transport measures. This programme was launched in 2018.

As the Transport Sector accounts for approximately one fifth of Ireland's national emissions there is no doubt the sector has a critical role to play in the national carbon reduction effort to achieve the commitments under the Paris Agreement. The *Climate Action Plan* (2019) clearly recognises that Ireland must significantly step up its commitments to tackle climate disruption; as such, the Plan proposes that the transport sector reduces emissions by 35-40% by 2030.

Investment in Public Transport to Encourage Modal Shift:

Continued investment in increasing capacity and improving quality of the public and sustainable transport systems is critical. Under the National Development Plan, €8.6 billion has been indicatively allocated over the period 2018 to 2027 towards the development of sustainable mobility. Improvements to public transport services and infrastructure are central to providing an alternative to private car travel, not only to reduce traffic congestion and carbon emissions, but also to enable the sector to cater for the increasing demands associated with population growth and employment in a greener and more environmentally sustainable way.

The *Climate Action Plan* commits to:

- An additional 500,000 public/active travel journeys daily by 2035;
- 100% of the urban public service obligation bus fleet to be low-emission vehicles by 2035, with only zero-emission buses purchased post 2025; and
- 100% electric urban commuter trains by 2045.

Investment in Electric Vehicles

The transition to alternatively-fuelled vehicles is a necessary step-change for Ireland to effect a substantial reduction in emissions. Following on from the ambition articulated in the *National Policy Framework for Alternative Fuels Infrastructure for Transport in Ireland 2017-2030* that all new cars and vans sold in Ireland from 2030 onwards will be zero emissions, the *Climate Action Plan* set an ambitious targets of 180,000 electric vehicles (EVs) on Irish roads by 2025 and just under one million by 2030. With just over 16,700 EVs currently in Ireland (end of Jan 2020), these targets are very challenging however they are indicative of the scale of the transformation that is needed across all sectors if Ireland is to reduce national emissions and reach its legally binding emission ceiling in future years.

EV sales in Ireland are rapidly increasing, albeit from a very low base; in 2019 a total of 7,902 new EVs were registered, more than double the increase in 2018 when there were 3,848 newly registered EVs in Ireland.

It is widely expected that, over the coming years, the combination of improvements in technology, reductions in vehicle purchase prices, increasing driving ranges and model availabilities, coupled with Government incentives and new investment in the charging network will maintain the current positive policy environment under which we have seen EV sales rise steeply over the past number of years. In addition, Action 79 of the *Climate Action Plan* commits Ireland to the development of a roadmap on the optimum mix of regulatory, taxation and subsidy policies to drive a significant ramp-up in passenger EVs and electric van sales from very early in the decade.

Low Emission Bus Trial

Bus services form the backbone of public transport provision in Ireland, carrying the vast majority of public transport passengers. Therefore, transitioning the national bus fleet to lower emitting alternatives has the potential to reduce the transport emissions. However, the bus/coach fleet is responsible for c. 3% of all transport-derived CO₂ emissions and so conversion has limited mitigation impact. Nevertheless, moving to cleaner public transport vehicles shows important leadership in this area and undoubtedly begins to normalise the use of alternative fuels and energy storage/propulsion technologies, as well as having considerable co-benefits for air quality. Furthermore, under *BusConnects* it is expected that by 2023, half of the bus fleet will be converted to lower emitting alternatives, with plans for full conversion by 2030.

Under *Project Ireland 2040*, the State committed to end the purchase of diesel-only buses for the national urban public bus fleets from July 2019. In 2018, the Department of Transport, Tourism and Sport, together with the National Transport Authority, Dublin Bus and Bus Éireann, commissioned a comprehensive series of bus trials to help inform future bus procurement decisions. The trial assessed full electric, diesel-electric hybrid, compressed natural gas, and retro-fitted buses under real-driving conditions on selected routes in both Dublin and Cork. Each of the fuels and technologies underwent testing and were compared against a Euro VI diesel baseline. The trials considered CO₂ and air pollutant emissions, the contribution potential towards renewable energy targets as well as other criteria such as costs, fuel economy, availability and infrastructural requirements for each technology. The Low-Emission Bus Trial ran from 2018 until April 2019; [trial findings](#) were subsequently published. Analysis of the suitability of different fuelling options for urban bus fleets is a complex issue and must consider a range of diverse and variable factors. Requirements of the EU *Clean Vehicles Directive* must also be considered.

Note 5: Low Emission Vehicle Incentivisation (Tax foregone)

There are a number of elements to the incentivisation of LEV adoption summarized below along with links to the relevant sources.

<u>Vehicle Registration Tax Relief</u>	Vehicle Registration Tax Relief, which includes: - Up to €5,000 for new BEV until end 2021 - Up to €2,500 for PHEVs until end 2020
<u>Accelerated Capital Allowance (ACA)</u>	EVs and their charging infrastructure qualify under the ACA Scheme.
<u>0% Benefit-in-Kind (BIK)</u>	A 0% BIK rate (up to €50,000) is available to incentivise EVs without mileage conditions for at least three years.
<u>Low Motor Tax</u>	Electric vehicles qualify for the lowest motor tax band available.

Table: Low Emission Vehicle (LEV) Incentivisation Tax Foregone

Year	Hybrids €m	Plug in Electric €m	Battery Electric €m	Total Tax Foregone
2019	20.8	7.2	17.3	45.3

Note 6: Public Service Provision Payments (PSPP)

This is the funding that the Exchequer provides to support the continued operation of public transport services provided by public transport operators for the provision of socially necessary however financially non-viable, transport services. It also includes funding for local link services under the Rural Transport Programme which is managed by the National Transport Authority.

It does not include payments to support the Essential Air Services Programme (i.e. the PSPP for air routes).

Table: PSPP by operator for 2019

Operator	2019 PSPP Expenditure/Allocation €million
Dublin Bus	57.7
Bus Éireann	68.8
Iarnród Éireann (Irish Rail)	128.4
Other PSPP Operators	0.9
Other PSPP Related Costs	12.5
Go Ahead Ireland	34.9
Rural Regular Transport Services	7.7
Fare Revenue Offset*	-17.4
Rural Transport**	14.4
Total	307.9

* Fare revenue offset. This is the amount of fare revenue collected by the National Transport Authority directly from bus market opening services i.e. those operated by Go Ahead Ireland.

**Accounted for under REV subhead B 7.2, this comprises primarily current funding with a small amount of capital funding. The bulk of this funding is provided to the NTA for services under the Rural Transport Programme (RTP), which the NTA manages on behalf of the DTTAS. These services, which operate under the Local Link brand, are provided by approx. 400 private sector operators/companies and are contracted directly by the NTA. The current funding also includes administrative costs for both the NTA and the Local Link Offices (Transport Co-Ordination Units) which in turn manage the services on a day-to-day basis for the NTA. There is also some capital funding provided to the NTA under B 7.2 for the RTP (approx. €650,000 per annum) for projects such as the Integrated Ticket Management System.

Note 7: Public and sustainable transport investment Programme

This represents the State investment in public transport initiatives. The figure presented is split between investment in Dublin Bus, Bus Éireann, Iarnród Éireann (Irish Rail) and the LUAS tram service. It also funds cycling and walking initiatives and sustainable urban transport measures in cities.

The Irish Government has allocated €8.6 billion toward transforming sustainable mobility in Ireland and supporting realisation of the ambitious objectives of Project Ireland 2040. This investment will support increased modal shift toward greener and cleaner modes of personal transport and support more sustainable development in the years ahead.

Table: Investment programme for 2019

Main Programmes/Projects	Expenditure/Allocation €million
Heavy rail safety & development	271.4
LUAS Cross City	5.4
LUAS Green Line capacity enhancement Project	20.2
Other light rail expenditure	25.2
Bus fleet and BusConnects*	89.6
Sustainable Urban Transport (traffic management and related projects) & Cycling/Walking	39.6
Accessibility	6.4
Ticketing and technology	10.3
Smarter Travel & Others	4.3
Total	472.4

*Expenditure on BusConnects includes €4.03m allocated from Revised Estimates Volume Subhead B6 (Carbon Reduction) concerning the purchase of trial hybrid buses, which are now part of the bus fleet.

Heavy rail safety and development: In accordance with the requirements of EU law, the Department of Transport, Tourism and Sport (DTTAS) provides capital funding to Irish Rail under the Infrastructure Manager Multi-Annual Contract (IMMAC). This multi-annual investment programme protects investment already made in the national railway system by funding maintenance and safety projects needed to maintain safety and services levels in railway operations.

Further funding is provided through the National Transport Authority (NTA) for the development of heavy rail including electrification of track purchase of hybrid rail cars.

LUAS Cross City: LUAS is a tram/light electric rail system in Dublin. The LUAS Cross City project, which was completed in December 2017, extended the existing LUAS Green Line from St. Stephen's Green West to the Irish Rail Broombridge Station in Cabra, linking the Red and Green LUAS lines in the City Centre. The project included the purchase of 7 additional new 55 meter trams.

LUAS Green Line Capacity Enhancement Project: This project covers:

- lengthening of the 26 existing Green Line trams from 43 metres to 55 metres;
- procurement of eight new 55 metre trams in addition to the seven purchased as part of the LUAS Cross City project; and
- extension of the Sandyford Depot to accommodate the maintenance of the longer trams.

Once completed, the project will provide an approximate 27% increase in capacity. The project is now well underway with the depot works completed in 2019 and the first of the new tram extensions having entered service in Autumn 2019. The new additional trams are scheduled to commence arrival in Q3/Q4 2020.

Bus fleet/Bus Connects: The National Development Plan 2018-2027 identifies the delivery of the full BusConnects programme for Ireland's cities (inclusive of ticketing systems, bus corridors, additional capacity, new bus stops and bus shelters, transition of fleet to low emissions vehicles) as a key investment priority. As part of a four year capital envelope, the Government has committed over €770 million to this Programme out to 2021. Public consultations were carried out in 2018 and 2019 on the proposed network redesign and the core bus corridors. The final network redesign is due for publication in Q3 2020 and, following a public consultation process in 2020, planning permission for the bus corridors will be sought in Q1 2021.

Sustainable Urban Transport (traffic management and related projects) & Cycling/Walking: These are on-going sustainable transport investment programmes in the greater Dublin area and in regional cities including Cork, Galway, Limerick and Waterford. These involve traffic management, bus priority and other smarter travel projects designed to allow transport infrastructure to function more effectively and help relieve traffic congestion. Projects also provide either direct or indirect improvements for urban cycling and walking.

Accessibility Retro-fit Programme: Accessibility features, such as wheelchair access and audio/visual aids, are built into all new public transport infrastructure projects and vehicles from the design stage. However, there are legacy issues in relation to older infrastructure and facilities. To address these issues, the DTTAS funds this programme, managed by the NTA. The programme aims to install accessible bus stops, upgrade older bus and train stations to make them wheelchair accessible, and to provide grant support for the introduction of more wheelchair accessible vehicles into the taxi fleet. Funding for this programme has been trebled to almost €28 million for the period 2018 to 2021.

Ticketing and Technology: This covers advances in technology add new options for fare payments. Accordingly, the NTA is actively engaged on the next evolution of the [Transport For Ireland Leap Card](#) scheme, including investigating the development of an iPhone version of the Leap NFC top-up app, which until late 2019 could not be offered due to restrictions in the iOS operating system.

During 2019, the NTA continued work on the Next Generation Ticketing project, which forms part of the BusConnects programme, however will be rolled out to all public transport modes once successfully implemented on buses.

Note 8: Greenways

This programme provides support for the development of mixed-use trails for walkers, cyclists and other non-motorised transport in Ireland. A [national strategy for greenways was published in July 2018](#) and provides further detail on planned development of this programme.

Funds provided in 2017 and 2018 were primarily invested in construction, planning and design of a number of greenways which opened to the public in 2019 such as the Suir Blueway. The Royal Canal Greenway opened to the public in 2020. In the coming years South Kerry, Galway to Moycullen, and Galway to Athlone will all commence construction. There was additional minor expenditure in 2019 on a number of other projects.

Waterford Greenway

This is a 46 kilometre off road cycling and walking trail along the old railway line between Dungarvan and Waterford City. €2 million had previously been awarded in 2014 for some construction on the project. €1.455m was awarded in November 2018 for further works and €1 million was drawn down in 2018. Waterford City and County Council provided the bulk of the expenditure estimated at a total cost of €20 million. In 2019 funding was provided for sections from New Ross to Waterford and Middleton to Youghal. These will eventually link into the Waterford Greenway. This greenway has strengthened the local rural economy and communities, supported a strong economy and has enhanced amenity and heritage. Some 248,000 people used this greenway in 2017 (March to December) and 285,000 in 2018 for the full year.

Suir Blueway

Some €765,000 was allocated in November 2018 to finish the 21 kilometre Suir Blueway in Tipperary. The Suir Blueway was opened in May 2019. This cycle and walking path along the Suir River between Clonmel and Carrick-on-Suir strengthens the rural economies and communities along its route , promotes a strong economy and enhances amenity and heritage.

Royal Canal Greenway

Some €3.63 million was provided in 2017 and €1.24 million in 2018 to the Royal Canal Greenway. It has opened during 2020. It is 121 kilometres of waterside greenway which will have great potential to attract users and regenerate the Royal Canal and its hinterlands. It will run initially from Maynooth in Co Kildare to Clondara in County Longford. It will also form part of the Dublin to Galway Greenway and will be routed by the National Transport Authority into Spencer Dock in Dublin City Centre, terminating at the river Liffey, where it will connect with the River Liffey urban cycleway.

South Kerry

The South Kerry Greenway received €600,000 for 2018 and €540,000 for 2017 and is currently going through the planning process.

The proposed South Kerry Greenway is a 32 kilometre long, 3 metre-wide walk and cycleway, beginning in Faha near Glenbeigh and terminating in Renard in South Kerry.

Climate Change Adaptation

Note 9: Flood Risk Management

This expenditure supports investment in major flood works. It will provide for the ongoing development of structural and non-structural measures to mitigate the impact of flooding on society, households and businesses.

The Office of Public Works (OPW) is the lead State body for the coordination and implementation of Government policy on the management of flood risk in Ireland. The OPW is also the national authority for the implementation of the EU Directive on the Assessment and Management of Flood Risks [2007/60/EC].

The OPW has, since 1995, completed 45 flood relief schemes, costing over €400 million, protecting 10,000 properties and avoiding damages to businesses and households of €2 billion, approximately.

The Catchment Flood Risk Assessment and Management (CFRAM) Programme was the largest study of flood risk management undertaken in Ireland, followed best international practice, assessed the flood risk for those 300 communities most likely to be impacted from flooding in the future, and included 90 coastal communities.

The flood risk in these 300 communities represents 80% of the risk from the primary cause of flooding in Ireland and the communities are home to almost 70% of the population.

The CFRAM Programme led to the launch in 2018 of 29 Flood Risk Management Plans which included proposals for 118 new flood relief capital projects in addition to the 33 projects already in train giving an investment programme comprising 151 projects in total. The details of the flood risk and the FRMP by location are available on the OPW website www.floodinfo.ie.

In 2018 CFRAM and the FRMPs identified that 34,500 properties nationally are at risk from flooding from a 100-year flood event and that 95% of these properties can be protected against these flood events with continued investment in flood relief schemes recommended by the FRMPs.

The flood risk management programme is underpinned by a capital allocation of c. €1 billion in the National Development Plan 2018-2027. The €1 billion investment in flood relief over the National Development Plan 2018-2027 will protect 95% of properties assessed by the CFRAM Programme to be at significant risk from flooding.

The number of flood relief schemes currently under design and construction has almost trebled from 33 to 92, following the launch the Flood Risk Management Plans in May 2018.

80% of the work to provide this national level of protection is complete or underway, on projects which are designed to be adaptable to manage the additional future risk from climate change. In addition, some €40 million in funding provided to local authorities under the OPW's Minor Works Scheme has supported 580 projects providing protection to some 7,000 properties from localised flood risk.

All major flood relief works comply with the requirements of national and EU law, including full environmental impact assessments (EIA) and Appropriate Assessments (AA) under the Habitats Directive. These assessments involve full consultation with all relevant and interested parties and identify mitigations to reduce or avoid damage.

A National Steering Group has been established to oversee the establishment of a new National Flood Forecasting and Warning Service.

Environmentally Sustainable Management of Living Natural Resources and Land Use

Note 10: Forestry and bioenergy

This provides grants and annual premium payments to farmers (for 15 years) in exchange for planting trees. During 2019 a number of new measures were introduced to increase levels of biodiversity and to assist the sustainable management of forests. These measures included support for additional management options such as continuous cover forestry (CCF) which gives forest owners an alternative to the more traditional harvesting systems such as clearfelling on certain areas.

Based on the accounting rules of the Land use, land-use change, and forestry (LULUCF) Regulation agreed in 2018, up to 2 Mt of CO₂ per annum is forecast to be accountable against Ireland's Effort Sharing Regulation targets from afforested land. In 2019, 3,550 hectares of new forests were planted in Ireland by private landowners under the afforestation scheme. In addition, over 93 kilometres of forest roads were grant aided through the forest road scheme which will facilitate the mobilisation of biomass for wood products and energy.

Based on the 2018 National Inventory Report to the UNFCCC, forests in Ireland sequestered over 3.6 Mt of CO₂ in 2016 with a further 0.8 Mt of CO₂ being added to the carbon pool of harvested wood products. It is estimated that the use of wood for energy results in greenhouse gas savings of approximately 0.88 million tonnes per year based on recent available figures.

During the first 5 years of the Forestry Programme 2014-2020, total afforestation has exceeded 25,000 hectares and over 380 kilometres of forest roads were constructed. Total expenditure along with future commitments amount to €260 million for this period.

Note 11: Environmental Protection Agency

Funding is provided to support the operation of the Environmental Protection Agency (EPA). The EPA is an independent public body established under the Environmental Protection Agency Act, 1992. It has a wide variety of functions relating to the protection of Ireland's environment, ranging from the enforcement of environmental law, monitoring, analysing and reporting on the environment, waste management and radiological protection. The EPA funds environmental research to identify pressures, inform policy and provide solutions in the areas of climate, water and sustainability; and new research projects into water, climate & air and environmental sustainability.

Note 12: International Climate Change Commitments

Ireland's international climate change commitments are reported and measured as part of its national climate finance figures. A climate finance report is prepared annually by the Department of Foreign Affairs.

The 2018 report is available [here](#).

Note 13: Landfill remediation

The roadmap to delivery of the landfill remediation programme is set out in the [Regional Waste Management plans 2015 – 2021](#). The plans set out the role and obligations on Local Authorities to identify and manage any waste impacted sites in their locality. The provision of funding from the Department of Communications, Climate Action and the Environment (DCCAE) is in recognition of the financial burden this can place on Local Authorities. There is a focus on historic landfill sites which were Local Authority operated between 1977 – 1997 however funding is also provided for other landfills as needed, including unauthorised or illegal and pre-1977 sites. The Local Authorities are mandated to identify and monitor these sites and undertake any works required to address any potential risk to the environment and human health.

Significant work has been undertaken to support delivery of the roadmap and funding has been made available to ensure there are dedicated resources to support delivery in the EPA and at regional level with dedicated regional co-ordinators in place for the programme. In addition, training in the [EPA Code of Practice](#) was rolled out to staff from all Local Authorities to build expertise in the area.

Tyres

The provision of funding for historic tyre clean-up allowed for short term, targeted projects to address historic tyre sites. This funding was drawn down from the landfill remediation grant subhead and saw a large number of sites cleaned up in this focussed drive. DCCAE introduced new structures for tyres and waste tyres on 1st October 2017 which included the introduction of a full Producer Responsibility Initiative (PRI) with producers and importers taking on responsibility for the financing and collection of waste tyres from tyre suppliers. The environmental benefits of managing this difficult waste stream in an appropriate manner are very strong and the outcomes from the introduction of the scheme have been evident. The introduction of the scheme has resulted in a radical reduction in the dumping of waste tyres and sound management of how those tyres are collected and reused.

Diesel/oil laundering

A small amount of funding is provided for under the landfill remediation programme each year to support enforcement actions regarding the illegal laundering of oil/diesel which requires immediate clean-up actions due to the environmental risk posed by such sites. Given the illegal nature of this activity the number of sites may change year to year. It is also subject to targeted waste enforcement actions to mitigate it.

Note 14: National heritage (National Parks and Wildlife Service)

The National Parks & Wildlife Service (NPWS) of the Department of Culture, Heritage and the Gaeltacht (DCHG) is responsible for the conservation of nature and biodiversity in Ireland.

The overarching strategy for nature conservation is Ireland's [3rd National Biodiversity Action Plan 2017-2021](#) (NBAP), a Government policy that is comprised of a suite of Objectives, Targets and Actions that aims to achieve Ireland's Vision for Biodiversity that "biodiversity and ecosystems in Ireland are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally". Many positive actions for Biodiversity have been taken since 2017.

There has been considerable increase in awareness of, engagement in and collaboration on biodiversity issues since the introduction of the NBAP. This was identified as an area needing particular effort across all sectors of society.

In 2018, the DCHG introduced a local authority biodiversity grant scheme, aimed at assisting local authorities with programs or projects that support implementation of the NBAP, particularly in raising awareness of biodiversity issues and actions, in their areas and regions. In its first year, an amount of €400,000 was available to local authorities. The scheme has been continued since and funding has increased with an amount of €500,000 having been made available in 2019.

Note 15: Peatlands restoration and management

The NPWS supports the Peatlands Council, which was charged by Government to develop the National Peatlands Strategy, which was published in 2016. The strategy contains a comprehensive list of actions, necessary to ensure that Ireland's peatlands are preserved, nurtured and become living assets within the communities that live beside them.

A review of the strategy was published in 2017 and can be found at [this link](#).

It is expected that within 5-10 years restoration of the high bog will promote the abundance and diversity of typical raised bog flora species. In turn this will encourage the return species of fauna that are characteristic of intact raised bogs (curlew, meadow pipit, skylarks, dragonflies, spiders and other invertebrates).

It is expected that within 5-10 years of restoration of the cut over bog there will be a transformation from species-poor, barren spreadlands to species-rich vegetation. This will allow the development of a wide range of wetland habitats many of them of high priority national & European conservation value. Instead of five or six species of common peatland plants there will be a plethora of more interesting species. Again this increase in plant diversity will promote the conditions suitable for a rich variety of fauna.

Renewable Energy

Note 16: Energy research Programmes

The SEAI National Energy Research Development & Demonstration (RD&D) Funding Programme is seen as a key enabler of Ireland's medium to long term energy policy targets and the Climate Action Plan. Energy research and innovation will be crucial for Ireland's medium and long term decarbonisation targets. The programme has funded more than a hundred projects to the value of €21 million during 2018 and 2019. SEAI is embarking on a project to transform public sector support for Irish energy research and innovation, aimed at achieving greater impact and delivering significant added value for the sector. This has involved a complete overhaul of the SEAI National Energy RD&D Funding Programme. Key outcomes to-date include:

- Increased Annual RD&D Programme Demand: growth from a baseline of €1 -€3 million to now exceeding €35 million.
- External funding leveraged: attracted commitments of some €3 million in external funding.
- Strengthened Cross-Government energy-related priorities: introduction of annual Cross-Government stakeholder consultation before each call launch to prioritise energy research topics.
- Boost to the Irish energy innovation industry: with approximately 60% of applications in 2019 coming from non-academic organisations.

All projects funded by the National Energy RD&D Funding Programme are available to view on the [SEAI's National Energy Research Database](#).

Sustainable Water and Wastewater Management

Note 17: Rural water programme

This covers six Programmes which are all aimed at environmentally sustainable outcomes:

- supports the amalgamation of group water Schemes to improve efficiency;
- fund water conservation;
- support new group water Schemes as these are more energy efficient than multiple individual supplies;
- support water conservation practices;
- support innovation and research to develop the efficiency of the rural water.

Note 18: Irish Water capital expenditure

Irish Water is a fully publicly owned, regulated, commercial State body with responsibility for the operation and maintenance of water and wastewater assets. It was established to provide safe, clean, affordable and environmentally compliant water and wastewater services to households and businesses connected to the public networks. This involves treating 1.7 billion litres of drinking water and 1.3 billion litres of wastewater each day. Irish Water's water and sewer networks require a multi-billion euro investment programme. The key challenges for the Irish water industry are to:

- Enhance compliance with regulatory standards (both drinking water and wastewater);
- Address the network loss rate and reduce leakage;
- Increase network and treatment capacity to support growth, both social and economic; and
- Develop the resilience required to cater for greater frequency of extreme weather events.

This meant Irish Water's capital expenditure in 2019 was across three themes.

- 1) Quality, which brings and maintains public water and wastewater services to acceptable international benchmarks and ensures improved compliance with public health and environmental standards;
- 2) Conservation, which is prioritises improved resource management, abstraction control, source protection, tackles leakage and encourages behavioural change; and
- 3) Future proofing, which is supports economic and social progress and improves capacity and resilience.

2019 investment includes the upgrade of the Ringsend Wastewater Treatment Plant along with the upgrade of Vartry Water Supply Scheme.

The Ringsend Upgrade Project is a critical element of a range of major investments which Irish Water has undertaken to support housing and economic projections for growth for the Greater Dublin Area and to protect the environment. This upgrade project will allow the Ringsend Wastewater Treatment Plant to treat the increasing volumes of wastewater arriving at the plant to the required standard and capacity, enabling future housing and commercial development and helping to ensure that Dublin is able to sustain continued growth. The upgrade will take place on a phased basis to ensure that the wastewater generated in homes and businesses continues to be treated to the highest possible level during the upgrade works. When the proposed upgrade project is completed, the Ringsend Wastewater Treatment Plant will be able to treat wastewater for up to 2.4 million population equivalent while meeting the standards of the Urban Wastewater Treatment Directive.

Table 7: Sample of Irish Water Projects

Irish Water Projects	2019 Expenditure €m	2019 Allocated Amount €m
Ringsend Wastewater Treatment Plant	37.6	37.6
Vartry (see case study on page 25)	31.3	31.3
Cork Lower Harbour	20.4	20.4
GDRDP: Blanchardstown Sewerage Scheme	15.3	15.3
Upper Liffey Valley Sewerage Scheme 2A	12.3	12.3

More information about Irish Water projects can be found on the Irish Water website and further details are set out in the Irish Water Strategic Funding Plan 2019.

Case Studies

A. Vartry Water Supply Scheme



Background

The Vartry Water Supply Scheme provides drinking water for a supply area stretching from Roundwood, through north Wicklow up to south Dublin and serves over 200,000 people. It was developed by Dublin Corporation in the 1860s and includes two reservoirs, a water treatment plant, a 4 kilometre tunnel under Callowhill and 40 kilometres of trunk mains which deliver water to storage reservoirs at Stillorgan in south Dublin. The scheme still provides up to 15% of the domestic, commercial and industrial requirement of the Greater Dublin Water Supply Area.

The scheme is currently on the Environmental Protection Agency's (EPA) Remedial Action List which identifies supplies that are in urgent need of improvement. The construction of a new water treatment plant at Vartry, upgrade works to the reservoir and the construction of a new link pipeline between Vartry and Callowhill are underway at the time this Report was finalised. This investment will ensure that water supply complies with water quality standards set out in the European Union Drinking Water Directive and the current, national Drinking Water Regulations.

Vartry-Callowhill Link

The original scheme included a 4 kilometre tunnel which was over 150 years old and at risk of collapse. Construction of a new link from the existing treatment plant at Vartry commenced in January 2018 and was commissioned in December 2018. The works included a new pumping station at the existing Vartry Water Treatment Plant, 4 kilometres of buried pipeline and a break pressure tank.

Vartry Water Treatment Plant upgrade

The security of supply from Vartry is at risk due to the algal (diatom) blooms which can occur from March to May each year which can reduce the amount of drinking water which the plant can provide by over 50%. Upgrades are also required to improve the final quality of the drinking water and to ensure it fully complies with the drinking water regulations. The structural works are well advanced and work on the fit out of the water treatment plant has commenced.



Construction of the new water treatment plant at Vartry (March 2020)

Irish Water has also committed to release sustainable freshwater flows to the River Vartry downstream from the new Water Treatment Plant. This protection is especially important at times of drought. The freshwater flows will come directly from the existing Vartry reservoir and is in addition to the natural flows from groundwater, other tributaries in the catchment and from the reservoir itself when the water levels are high. This will be the first time in the 150 history of the scheme that such a guarantee will be used to safeguard the ecology of the river. Once completed the upgrade will secure the long-term future of the water supply for 200,000 people.

B. Iarnród Éireann (Irish Rail) Hybrid Train Project

What do you do with a 30 year asset that is less than half way through its life and yet is falling behind in technical development as the transport industry moves forwards with a greener agenda? Upgrading to Hybrid is one possibility and Iarnród Éireann has contracted with Rolls Royce Power Systems/MTU to test, trial and operate nine Hybrid Powerpacks on the Class 22000 InterCity Railcar fleet of trains. This is an investment of €2.8 million in the trial of Hybrid technology seeking fuel savings and carbon emissions reduction. The project would cost approximately €100 million if the entire fleet is upgraded.



Iarnród Éireann operates a fleet of 234 InterCity Railcar (ICR) Vehicles manufactured in South Korea by Hyundai Rotem. Each vehicle is individually powered by its own diesel engine and transmission by a self-contained underfloor powerpack. The fleet travels 50 million vehicle kilometres per annum consuming 23 million litres of diesel. This number is due to rise further still with the addition of new vehicles due to enter service in 2022 and more intensive services. This is a fleet size increase of just under 20%, which will result in a proportional increase in fuel consumption and carbon emissions. The ICR vehicle type has an expected 30 year lifespan and the fleet is now at half-life approaching 15 years old.

The emissions of the current powerpack installed on the fleet are compliant with the emissions requirements of the Non Road Mobile Machinery Directive 2004/26/EC which was in force at the time of ordering. The existing powerpack is coupled with an older type of transmission which is now considered an outdated less efficient technology - a hydrodynamic transmission. An opportunity now exists to upgrade, meeting up to date emissions standards (Stage V) at half-life overhaul, and implement some of the latest technology to reduce fuel consumption.

Because of the complexity of the upgrade it will be done in two phases: Phase 1 will see the fitment of the new Stage V Powerpacks and later on Phase 2 will see these upgraded to Hybrid drive and the installation of energy storage batteries on the train.

The MTU Stage V Hybrid Powerpack consists of;

MTU Stage V Diesel Engine:

- Equipped with Exhaust Gas after Treatment (EGAT) system which delivers a reduction of harmful PM, NOX, CO₂ and CO gases.
- Most advanced EU emissions standard is achieved.

ZF EcoWorld Transmission:

- 2 Stage Electro-Mechanical Transmission which achieves a greater operating efficiency than the current transmission.
- This contributes to a 15-20% reduction in fuel consumption and harmful emissions when compared to the current transmission.
- Reduced volume transmission oil required.
- More Powerful Hydrodynamic Retarder for improved dynamic braking.
- Increased acceleration rate, which will aid journey time reduction.

MTU Hybrid Powerpack (Battery, diesel engine & ZF transmission combined):

The Stage V Hybrid Powerpack will use approximately 33% less fuel compared to the current Stage IIIa Powerpack. If implemented across the current fleet this equates to an annual fuel saving of more than 7 million litres of diesel fuel and associated carbon emissions reduction of 18,000 tonnes of CO₂.

The Powerpack also means up to 21 dB noise saving when in silent mode in stations and urban areas.

- Other benefits are:
 1. The expected longer time between overhaul intervals.
 2. Reduced maintenance intervention.
 3. Increased reliability.
 4. Latest emissions standard compliance.

Innovation:

Hybrid drives offer significant potential for reducing fuel consumption and emissions in rail vehicles due to recovery and storage of kinetic energy, which would otherwise be lost in traditional traction systems. Lithium Ion battery technology, whilst existing in the automotive industry, is new in the rail industry.

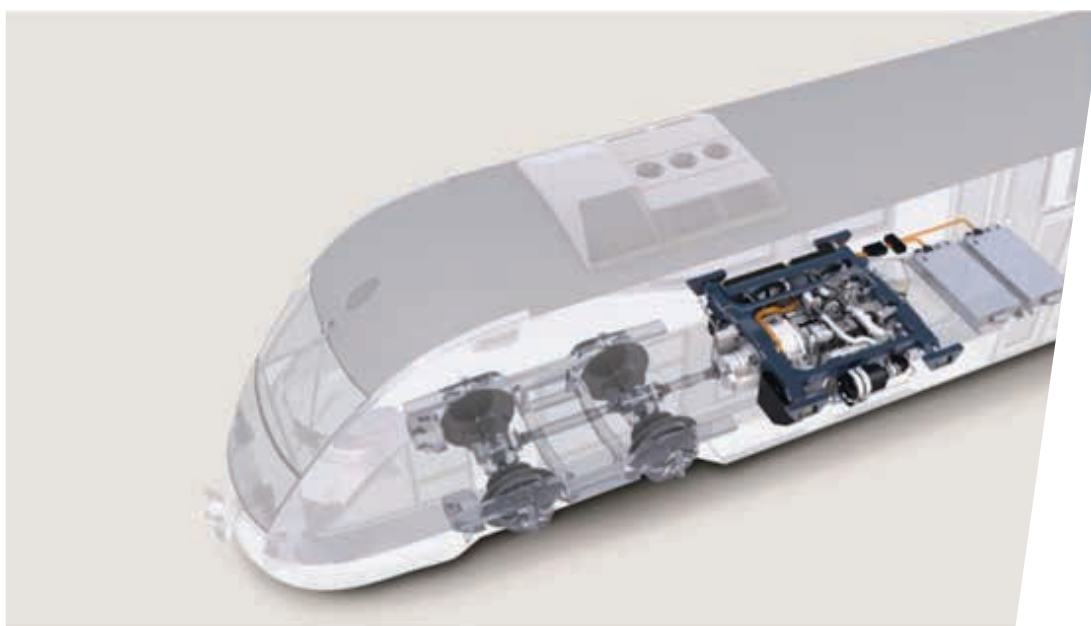


Fig 1. The MTU 1800 Series Stage V Hybrid Powerpack

Hybrid drive consists primarily of an “E-Machine” and Lithium Ion Battery Pack.

- The E-Machine can act as a Generator, recouping energy created during braking.
 - This energy is stored in the Li-Ion battery back for later use supplementing the demand on the diesel engine.
- The E-Machine can act as a Motor, propelling the vehicle solely on electric power.
 - This allows for “Silent drive” in urban areas and stations.
 - This enables emissions free propulsion in urban areas and, if desired stations.
- The E-Machine can assist the diesel engine in “Performance” mode.
 - All available power to accelerate the train as quickly as possible. This could be utilised to increase capacity in congested sections of the Network.
- The E-Machine can be used to achieve maximum Fuel saving and emissions reduction in “Eco Mode”.
 - This is the current goal. An example scenario would be switching off the diesel engine on low load factor sections.
 - With the reduction in fuel consumption there is also a commensurate reduction in carbon emissions.

During the remainder of 2020 and 2021, both Iarnród Éireann and MTU will continue the engineering and design work in preparation for the Hybrid portion of the trial. This will include significant underfloor alteration to the vehicles. For example removing and replacing the existing 24 volt DC battery system and its ancillary equipment. In late 2021 the new hybrid powerpacks will be subjected to an intensive testing and commissioning phase, where the systems will be verified and validated. This will also include validating the fuel and carbon savings.

Appendices



Appendix 1 – 2017/2018 Allocation Table

Eligible Green Categories	Project/ Programme/ Scheme	2017 Green Expenditure (€m)	2018 Green Expenditure (€m)	Total 2017 and 2018 Expenditure (€m)	ISGB Proceeds Allocation
Built Environment/Energy Efficiency Total		137.6	185.6	323.2	209.4
Built Environment/Energy Efficiency breakdown	Sustainable energy programmes	90.1	127.8	217.9	142.1
	Sustainable Energy Authority of Ireland admin and general expenses	8.6	11.0	19.6	12.7
	Estate regeneration – social housing improvements	38.9	46.8	85.7	54.6
Clean Transportation Total		663.2	738.3	1,401.4	870.9
Clean Transportation breakdown	Carbon reduction	0.0	0.7	0.7	0.7
	Low emission vehicle incentivisation (Tax foregone)	15.6	27.9	43.5	31.0
	Public service provision payments	278.6	295.8	574.5	351.6
	Public and sustainable transport investment programme	368.9	411.3	780.2	485.1
	Greenways	0.0	2.6	2.6	2.6
Climate Change Adaptation Total		45.4	64.6	110.0	73.7
Climate Change Adaptation breakdown	Flood risk management	45.4	64.6	110.0	73.7
Environmentally Sustainable Management of Living Natural Resources and Land Use Total		159.6	132.9	292.6	164.9
Environmentally Sustainable Management of Living Natural Resources and Land Use breakdown	Forestry and bioenergy	101.6	70.7	172.3	91.0
	Environmental Protection Agency (EPA)	32.0	32.7	64.7	39.1
	International climate change commitments	2.5	4.5	7.0	5.0
	Landfill remediation	5.7	10.3	16.0	11.4

Eligible Green Categories	Project/ Programme/ Scheme	2017 Green Expenditure (€m)	2018 Green Expenditure (€m)	Total 2017 and 2018 Expenditure (€m)	ISGB Proceeds Allocation
	Climate initiatives – Technical research and modelling	0.6	0.2	0.8	0.3
	National Parks and Wildlife Service (NPWS)	17.1	14.0	31.1	17.4
	Peatlands restoration and management	0.1	0.6	0.7	0.6
Renewable Energy Total		6.5	8.4	14.9	9.7
Renewable Energy breakdown	Energy research programmes	6.5	8.4	14.9	9.7
Sustainable Water and Wastewater Management Total		406.6	539.1	945.7	620.4
Sustainable Water and Wastewater Management breakdown	Rural water programme	15.4	39.1	54.5	42.2
	Irish Water capital expenditure	391.2	500.0	891.2	578.2
Grand Total expenditure and allocations		1,418.8	1,669.0	3,087.8	1,949.0
ISGB Proceeds as at 31 December 2018					2,983.4
Unallocated Proceeds 1 January 2019					1,034.4
Allocations as a percentage					65.3%

Figures may not total due to rounding.

As noted on Page 8,9 of this report, an additional €23.9 million was allocated to eligible green projects in the appropriation accounts.

Appendix 2 – Compliance Review by Sustainalytics



Government of Ireland

Type of Engagement: Annual Review

Date: June, 2020

Engagement Team:

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Introduction

In 2018, the Government of Ireland (Ireland) issued green bonds aimed at financing projects which promote Ireland's transition to a low carbon, climate-resilient and environmentally sustainable economy. In 2020, Ireland engaged Sustainalytics to review the projects funded through the issued green bonds and provide an assessment as to whether the projects met the Use of Proceeds criteria and the Reporting commitments outlined in the Irish Sovereign Green Bonds Framework.

Evaluation Criteria

Sustainalytics evaluated the projects and assets funded in 2018 and 2019 based on whether the projects and programmes:

1. Met the Use of Proceeds and Eligibility Criteria outlined in the Irish Sovereign Green Bonds Framework; and
2. Reported on at least one of the Key Performance Indicators (KPIs) for each Use of Proceeds criteria outlined in the Irish Sovereign Green Bonds Framework.

Table 1 lists the Use of Proceeds, Eligibility Criteria, and associated KPIs while Table 2 lists the Detailed Findings.

Table 1: Use of Proceeds, Eligibility Criteria, and associated KPIs

Use of Proceeds	Eligibility Criteria	Key Performance Indicators
Built Environment / Energy efficiency	Support schemes for residential energy efficiency programmes (including heating, retrofit, insulation).	Annual energy savings (GWh)
		Annual GHG emissions reduced/avoided in tonnes of CO ₂ equivalent (ktCO ₂ e)
	Support schemes for energy efficiency programmes for the commercial, public and industrial sector.	Number of homes renovated
		Number of people benefited from grants
Clean Transportation	Public transportation initiatives, low emission vehicles incentives and infrastructure, and alternative fuels.	Number of public transport passenger journeys
		Additional km of cycling infrastructure completed / improved (km)
	Public programmes incentivizing modal shift away from private car use.	Take-up of Grant Schemes/ Tax foregone provided (Number of vehicles)
Climate Change Adaptation	Flood relief and other risk mitigation programmes.	No. of Properties Protected on Completion
		Damages/Losses Avoided on completion (Million)

Environmentally Sustainable Management of Living Natural Resources and Land Use	Grants, subsidies, and support schemes designed to reduce agricultural environmental impacts.	Number of hectares of forest planted
	Afforestation, restoration and conservation programmes.	Number of peatland areas restored
Renewable Energy	Support schemes for renewable heat use and energy storage.	Number of companies (including public sector organisations) benefitting from SEAI Research & Innovation programmes as lead, partner or active collaborators
	Research and development for the commercialization of renewable energy technologies.	Number of SEAI Research & Innovation awards benefitting research institutions
Sustainable Water and Wastewater Management	Clean water and wastewater treatment projects.	Water savings (million litres of water per day)
		New and upgraded water treatment plants
		Length of water main laid (km total)
		New and upgraded wastewater treatment plants
		Length of sewer laid (km total)

Issuing Entity's Responsibility

Ireland is responsible for providing accurate information and documentation relating to the details of the projects that have been funded, including description of projects, estimated and realized costs of projects, and project impact.

Independence and Quality Control

Sustainalytics, a leading provider of ESG and corporate governance research and ratings to investors, conducted the verification of Ireland's Green Bond Use of Proceeds. The work undertaken as part of this engagement included collection of documentation from Ireland employees and review of documentation to confirm the conformance with the Irish Sovereign Green Bonds Framework.

Sustainalytics has relied on the information and the facts presented by Ireland with respect to the Nominated Projects. Sustainalytics is not responsible nor shall it be held liable if any of the opinions, findings, or conclusions it has set forth herein are not correct due to incorrect or incomplete data provided by Ireland.

Sustainalytics made all efforts to ensure the highest quality and rigor during its assessment process and enlisted its Sustainability Bonds Review Committee to provide oversight over the assessment of the review.

Conclusion

Based on the limited assurance procedures conducted,¹ nothing has come to Sustainalytics' attention that causes us to believe that, in all material respects, the reviewed bond projects, funded through proceeds of Ireland's Green Bonds, are not in conformance

¹ Sustainalytics limited assurance process includes reviewing the documentation relating to the details of the projects that have been funded, including description of projects, estimated and realized costs of projects, and project impact, which were provided by the Issuer. The Issuer is responsible for providing accurate information. Sustainalytics has not conducted on-site visits to projects.

with the Use of Proceeds and Reporting Criteria outlined in the Irish Sovereign Green Bonds Framework.

Detailed Findings

Table 2: Detailed Findings

Eligibility Criteria	Procedure Performed	Factual Findings	Error or Exceptions Identified
Use of Proceeds Criteria	Verification of the projects funded by the green bond in 2019 to determine if projects aligned with the Use of Proceeds Criteria outlined in the Irish Sovereign Green Bonds Framework and above in Table 1.	All projects reviewed complied with the Use of Proceeds criteria.	None
Reporting Criteria	Verification of the projects funded by the green bond in 2017 & 2018 to determine if impact of projects was reported in line with the KPIs outlined in the Irish Sovereign Green Bonds Framework and above in Table 1. For a list of KPIs reported please refer to Appendix 1.	All projects reviewed reported on at least one KPI per Use of Proceeds criteria.	None

Appendices

Appendix 1: Impact Reporting by Eligibility Criteria

Use of Proceeds Category	Environmental Impact Reported by Eligibility Criteria
Built Environment / Energy Efficiency	Annual energy savings (GWh) reported as 479.12 in 2017 and 621.06 in 2018
	Annual GHG emissions reduced/avoided in tonnes of CO ₂ equivalent (ktCO ₂ e) reported as 117 in 2017 and 150.5 in 2018
	Number of homes renovated reported as 56,475 (2017 and 2018)
	Number of people who benefited from grants reported as 46,171 (2017 and 2018)
Clean Transportation	Number of public transport passenger journeys (Million) reported as 252.5 in 2017 and 268.66 in 2018
	Additional km of cycling infrastructure completed / improved (km) from 2017-2018 reported as 60.6
	Take-up of Grant Schemes/ Tax foregone provided (Number of vehicles) from 2017-2018 reported as 28,674
Climate Change Adaptation	Number of Properties Protected on completion reported as 7,403 (2017 and 2018)
	Number of Damages/Losses Avoided on completion (Million) reported as € 658 (2017 and 2018)
Sustainable Agriculture and Sustainable Management of Living Natural Resources	Number of hectares of forests planted from 2017-2018 reported as 9,561
	Number of hectares of peatlands restored in 2018 reported as 203
Renewable Energy	Number of companies (including public sector organisations) benefitting from SEAI Research & Innovation programmes as lead, partner or active collaborators reported as 104 (2017 and 2018)
	Number of SEAI Research & Innovation awards benefitting research institutions reported as 63 (2017 & 2018)
Sustainable Water and Wastewater Management	Water savings (million litres of water per day) reported as 101.6 (2017 and 2018)
	New and upgraded water treatment plants reported as 15 (2017 and 2018)
	New and upgraded wastewater treatment plants reported as 25 (2017 and 2018)
	Length of water main laid (km total) reported as 654 (2017 and 2018)
	Length of sewer laid (km total) reported as 94 (2017 and 2018)

Appendix 2: Allocation reporting

This is the second annual allocation report issued in accordance with the Irish Sovereign Green Bonds ("ISGB") Framework .

EUR €1,96 million was allocated to eligible green projects from the proceeds on hand of EUR €3,29 million at the end of 2019. The remaining proceeds of EUR €1,32 million will be available for allocation in 2020. The table below sets out the timeline of the proceeds raised and allocated.

Table – Timeline of the ISGB proceeds raised and allocated

	EUR €
Total Proceeds from Irish Sovereign Green Bond inaugural syndicated sale October 2018	2,983,410,000
Amount available for allocation as at year end 2018	2,983,410,000
Allocated Proceeds 31st December 2018	-1,949,048,618
Unallocated Proceeds 1st January 2019	1,034,361,382
Total Proceeds from Irish Sovereign Green Bond syndicated tap sale October 2019	2,258,380,000
Amount available for allocation as at year end 2019	3,292,741,382
Allocated Proceeds 31st December 2019	-1,969,037,000
Unallocated Proceeds 1st January 2020	1,323,704,382

Some EUR €23.9 million of additional expenditure in eligible green categories highlighted in the 2018 Appropriation Accounts, is carried into the allocations to 2019. These adjustments, shown in the 2019 Allocation Table are a normal part of the government accounts process and are not considered to be significant by the ISGB Working Group.

The Impact Indicators for 2019 will be reported in 2021.

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