



Irish Sovereign Green Bond Allocation Report 2020



Rialtas na hÉireann
Government of Ireland

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Mount Hevey Bog Special Area of Conservation 2020
Cover, top: Hybrid bus, Dublin
Cover, bottom: Clara Bog Nature Reserve & Boardwalk

Introduction and summary

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

In 2020, €2,389.1 million was allocated to eligible green projects from ISGB proceeds. This is an increase compared with 2019. Much of this increase is from support for the public transport network due to the COVID-19 crisis. However, the pattern and breadth of allocations is broadly similar to 2019 and 2018.

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 per standard government bonds. They are allocated against eligible green projects which generate a positive environmental benefit.

In September 2020, the National Treasury Management Agency (NTMA) held its first auction of ISGBs as part of its regular benchmark bond issuance program. There was €1 billion nominal sold in the competitive phase of the auction with bids of €1.82 billion. There was an additional €100.6 million nominal sold in the non competitive phase of the auction. This increased the amount outstanding to €6.1 billion, building on the inaugural issue of €3 billion in 2018 and the syndicated tap of €2 billion in 2019.

ISGB Proceeds raised and allocations timeline (€)

	€2018	€2019	€2020
Starting balance		1,034,361,382	1,317,704,382
Proceeds from sales of ISGBs	2,983,410,000	2,252,380,000*	1,268,980,270
Proceeds for Allocation	2,983,410,000	3,286,741,382	2,586,684,652
Allocations to eligible green projects	(1,949,048,618)	(1,969,037,000)	(2,389,112,000)
End-year balance	1,034,361,382	1,317,704,382*	197,572,652

* These numbers have been updated to correct an error in the 2019 Allocation Report in which the proceeds from the sales of ISGBs were overstated by €6 million.

€2,389 million was allocated to eligible green categories from the proceeds on hand of €2,587 million on 2020. The remaining proceeds of €198 million will be available for future allocation.

Some €23.3 million of additional expenditure in eligible green categories highlighted in the 2019 Appropriation Accounts, is carried into the allocations to 2020. These adjustments are caused by the final confirmation of certain expenditure numbers after the production of the allocation report. They are shown in the 2020 allocation table.

This Report outlines how the allocations were made in 2020 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.

The Irish Government has committed to the implementation of a legally binding commitment to achieve a climate neutral economy by 2050, including an interim target to reduce emissions by 51% by 2030. This is one of the most ambitious climate targets in the world and its successful achievement will require a whole-of-society and whole-of-government approach, encompassing:

- Taxation;
- Expenditure;
- Regulation; and
- Behavioural change.

The medium term capital expenditure priorities are set out in the National Development Plan. This Plan committed €21.8 billion in capital funding directly to the transition to a low carbon and climate resilient society, €8.6 billion in capital funding for sustainable mobility and a further €8.8 billion to the sustainable management of water and other environmental resources. This represented more than one third of the total Government capital investment planned for the period 2018 - 2027.

This plan is currently under review, with an updated plan expected to be published later in 2021. Through balanced regional development, clustered and compact growth, and improved connectivity, the twin objectives of economic prosperity and environmental sustainability will be at the core of the forthcoming revised National Development Plan.

The Irish Government's commitment to meeting climate and environmental goals is also demonstrated through the annual budgetary process. In 2020, budgeted expenditure tagged as green by the Irish Government increased by 23% as compared with 2019 spending levels. In 2021, budgeted expenditure tagged as green increased by 44% as compared with 2020 expenditure levels. This included a 41% increase in investment for sustainable mobility programmes, a 72% increase in investment in energy research and a 36% increase in funding for residential retrofit programmes. This demonstrates the Irish Government is already making the investment decisions necessary to build a sustainable economy that is on the path to reaching net zero emissions by 2050.

Acknowledgements

This Report was produced with the co-operation of Government departments and other State bodies responsible for expenditure and subsidies which are allocated from the proceeds of ISGBs. The Working Group is grateful to the many colleagues who provided information and assistance.

Those Government departments and State bodies are as follows:

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

The Working Group would also like to acknowledge the kind assistance of the Office of Public Works and the Sustainable Energy Authority of Ireland for assistance with the material in the case studies.

Governance and project selection

As set out in the ISGB Framework, 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 the Environment, Climate and Communications 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 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;
- are funded, in whole or in part and whether directly or indirectly, through Exchequer funded expenditures, subsidies or tax foregone; and 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.

Compliance review by Sustainalytics

Based on the limited assurance procedures conducted, nothing has come to Sustainalytics' attention that causes us to believe that, in all material respects, the reviewed bond projects, funded through proceeds of Irish Sovereign Green Bonds, are not in conformance with the Use of Proceeds and Reporting Criteria outlined in the Irish Sovereign Green Bonds Framework.

The Sustainalytics full Compliance Review on this Report is available at this [link](#).

The Climate Action and Low Carbon Development (Amendment) Bill 2021

The Climate Action and Low Carbon Development (Amendment) Bill 2021 will support Ireland's transition to Net Zero and achieve a climate neutral economy by no later than 2050. It will establish a legally binding framework with clear targets and commitments set in law, and ensure the necessary structures and processes are embedded on a statutory basis to ensure we achieve our national, EU and international climate goals and obligations in the near and long term.

The Bill includes the following key elements:

- Places on a statutory basis a 'national climate objective', which commits to pursue and achieve no later than 2050, the transition to a climate resilient, biodiversity-rich, environmentally-sustainable and climate-neutral economy
- Embeds the process of carbon budgeting into law, Government are required to adopt a series of economy-wide five-year carbon budgets, including sectoral targets for each relevant sector, on a rolling 15-year basis, starting in 2021
- Actions for each sector will be detailed in the Climate Action Plan, updated annually
- A National Long Term Climate Action Strategy will be prepared every five years
- Government Ministers will be responsible for achieving the legally-binding targets for their own sectoral area with each Minister accounting for their performance towards sectoral targets and actions before an Oireachtas Committee each year
- Strengthens the role of the Climate Change Advisory Council, tasking it with proposing carbon budgets to the Minister
- Provides that the first two five-year carbon budgets proposed by the Climate Change Advisory Council should equate to a total reduction of 51% emissions over the period to 2030, in line with the Programme for Government commitment
- Expands the Climate Change Advisory Council from eleven to fourteen members, and provides that future appointments to the Council provide for a greater range of relevant expertise and gender balanced
- Introduces a requirement for each local authority to prepare a Climate Action Plan, which will include both mitigation and adaptation measures and be updated every five years. Local authority Development Plans will also align with their Climate Action Plan
- Public Bodies will be obliged to perform their functions in a manner consistent with national climate plans and strategies, and furthering the achievement of the national climate objective

Government approval was given on 2 February 2021 to draft amendments to the Petroleum and Other Minerals Development Act 1960 which would give statutory effect to ending the issuing of new licences for the exploration and extraction of gas. This commitment will be provided for in legislation.

Allocation table and analysis for the year ended 2020

The table of expenditure on eligible green projects of this Allocation Report is assembled as follows:

- **Eligible Green Categories:** Projects/ Programmes/Schemes aligned with the six eligible green categories as set out in the ISGB Framework.
- **Notes:** Each Project/ Programme/Scheme has an explanatory note.
- **Project/Programme/Scheme:** These have been identified by the ISGB Working Group.
- **2020 Expenditure:** All expenditure numbers can generally be traced to the Department of Public Expenditure and Reform's [databank](#) on its website, in the table net expenditure analysis by vote. The expenditure numbers for 2020 used in this report are based on a provisional outturn provided by the Department of Public Expenditure and Reform in its databank in May 2021 and will be subject to finalisation later in 2021 in the 2020 Appropriation Accounts. Any adjustments will be reported in the fourth allocation report to be published in 2022. When this process is applied to the 2019 allocation report, it amounts to some €23.3 million of additional expenditure in eligible green categories carried into the allocations in 2020.
- **Allocation from ISGB Proceeds:** The amount allocated to each Project/ Programme/ Scheme is shown and is sub-totalled by eligible green category.
- €2,389.1 million was allocated to eligible green projects from the total proceeds of €2,586.7 million outstanding at end-2020. The unallocated amount of €198 million at year end of 2020 is available for allocation in 2021.

Allocation Table¹

Eligible Green Categories	Note	Project/Programme/Scheme	2020 Green Expenditure (€m)	2020 Allocation* (A)	2019 Green Expenditure (Appropriation Accounts)	Adjustment to 2019 Allocation (B)	ISGB Proceeds Allocation (A+B)
Built Environment/Energy Efficiency Total			149.6	127.1	216.0	0.0	127.1
Built Environment/Energy Efficiency breakdown of programmes and schemes	1	Sustainable energy programmes	127.2	104.7	151.2	0.0	104.7
	2	SEAI admin and general expenses	12.4	12.4	17.4	0.0	12.4
	3	Estate regeneration – social housing improvements	10.0	10.0	47.5	0.0	10.0
Clean Transportation Total			1,293.4	1,282.9	839.2	0.1	1,283.0
Clean Transportation breakdown of programmes and schemes	4	Carbon reduction	1.9	0.4	5.6	2.0	2.4
	5	Low Emission Vehicle Incentivisation (Tax foregone)	39.1	39.1	45.3	0.0	39.1
	6	Public service provision payments	623.5	623.5	308.0	0.0	623.5
	7	Sustainable mobility investment programme	624.1	619.6	469.9	-2.5	617.1
	8	Greenways	4.8	0.3	10.4	0.6	0.9
Climate Change Adaptation Total			63.2	63.2	58.3	0.0	63.2
Climate Change Adaptation breakdown of programmes and schemes	9	Flood Risk Management	63.2	63.2	58.3	0.0	63.2

¹ Figures may not total due to rounding.

Eligible Green Categories	Note	Project/Programme/Scheme	2020 Green Expenditure (€m)	2020 Allocation* (A)	2019 Green Expenditure (Appropriation Accounts)	Adjustment to 2019 Allocation (B)	ISGB Proceeds Allocation (A+B)
Environmentally Sustainable Management of Living Natural Resources and Land Use Total			166.8	161.8	157.5	23.3	185.1
Environmentally Sustainable Management of Living Natural Resources and Land Use breakdown of programmes and schemes	10	Forestry and bioenergy	79.2	79.2	89.7	21.3	100.5
	11	Environmental Protection Agency	43.2	43.2	38.8	0.0	43.2
	12	International Climate Change Commitments	4.5	4.5	2.5	0.0	4.5
	13	Landfill remediation	12.0	12.0	7.0	0.0	12.0
	14	Climate Initiatives - Technical Research And Modelling	2.9	2.9	2.0	2.0	4.9
	15	National heritage (NPWS)	18.0	18.0	13.5	0.0	18.0
	16	Peatlands restoration and management	7.0	2.0	4.0	0.0	2.0
Renewable Energy Total			7.8	7.8	10.3	0.0	7.8
Renewable Energy breakdown of programmes and schemes	17	Energy research programmes	7.8	7.8	10.3	0.0	7.8
Sustainable Water and Wastewater Management Total			723.0	723.0	687.1	0.0	723.0
Sustainable Water and Wastewater Management Breakdown	18	Rural Water Programme	44.0	44.0	41.1	0.0	44.0
	19	Capital Expenditure provided to Irish Water for the provision of domestic water services	679.0	679.0	646.0	0.0	679.0
Grand Total expenditure and allocations			2,403.8	2,365.8	1,968.4	23.3	2,389.1

* Allocations are adjusted to take account of the use of proceeds from carbon tax. For more information see: [The use of carbon tax funds 2021](#).

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. Despite the impact of COVID-19 on these schemes in 2020, particularly between March and June when building works were fully paused, approximately 17,616 home upgrades received funding. In addition, 240 non-domestic buildings were upgraded under the Community Energy Grant scheme. These programmes include the following:

- **Better Energy Homes Scheme** provides a financial incentive to private homeowners who wish to improve the energy performance of their home. Fixed grants covering 30% of the works are provided towards the cost of a range of measures including attic insulation, wall insulation, heating systems upgrades, solar thermal panels and accompanying Building Energy Rating (BER). It is the most popular scheme in terms of the number of individual properties having undergone some form of State-funded refurbishment work.
- **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 143,000 homes have received free upgrades under the scheme leaving the occupants better able to afford to heat their homes to an adequate level.
- **Better Energy Communities** funds community-based partnerships to improve the energy efficiency of their area. It is applicable to homes, community facilities and businesses. 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** aims to objectively measure and validate the health and wellbeing impacts of improving the living conditions of vulnerable people living in energy poverty with chronic respiratory conditions. This is a joint policy initiative between Department of Environment, Climate and Communications and the Department of Health and is delivered by the Sustainable Energy Authority of Ireland and the Health Service Executive. This pilot scheme provides free energy efficiency upgrades to eligible homes, to make them warmer and more comfortable, especially during colder months.

Note 2: Sustainable Energy Authority of Ireland (SEAI) administration and general expenses

This funding is provided to support the operation of the SEAI. It undertakes a wide variety of tasks including administration and operation energy of 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 in meeting international reporting obligations, for advising policymakers and informing investment decisions. It also publishes extensive reports on energy production and consumption as well as 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 140,000 units.

Included within this range of programmes is the Energy Efficiency Retrofit Programme which provides funding to local authorities towards the upgrade of their housing stock to a high standard, enabling dwellings upgraded to achieve an improved level of energy performance, a reduction in emissions and yield an important fuel poverty dividend for low income households.

Similarly, under the Voids programme, to return vacant social housing to productive use, there was a strong emphasis on insulation retrofitting and 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.

Under the Voids programme, over 16,100 social homes have been brought back to use in the period 2014-2020. Over this period, energy efficiency works were undertaken on 11,724 of these homes.

No energy efficiency works were carried out on void properties in 2020 as the programme only provided for necessary works to comply with the Housing (Private Rented Standards) Regulations, 2019.

The Limerick Thermal Upgrade Programme – implemented under the Limerick Regeneration Framework Implementation Plan will include works to 1,500 houses when completed. The 2013 Limerick Regeneration Framework Implementation Plan (LRFIP) provides a roadmap for the programme, which will see some 536 new social homes delivered, as well as the refurbishment of over 1,500 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 for minor upgrade works and a B2 rating (or cost optimal equivalent) for works classified as major renovations. Over 1,190 houses have been upgraded, with approximately a further 310 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.

While the programme continued throughout 2020, no expenditure was incurred in that financial year pending the completion of final accounts and also due to lack of progress with the programme due to Covid-19 restrictions.

Clean Transportation

Note 4: Carbon Reduction

The Electric Small Public Service Vehicle (eSPSV) Grant Scheme (i.e. taxi/hackney/limousine) provides grants of €7,000 for the purchase of battery electric vehicles (BEVs) and up to €3,500 plug in hybrid vehicles (PHEVs), as well as an additional €2,500 for the conversion of an eSPSV into a wheelchair accessible vehicle. There is also 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 toll 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 began 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 currently 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. Improving public transport services and infrastructure is 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 growing population and employment in a greener and more environmentally sustainable way.

The *Climate Action Plan* commits to:

- An additional 500,000 public transport/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 emission, the *Climate Action Plan* set an ambitious targets of 180,000 electric vehicles (EVs) on Irish roads by 2025 and 946,200 by 2030. 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 2020 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 developing a roadmap on the optimum mix of regulatory, taxation and subsidy policies to drive significant ramp-up in passenger EVs and electric van sales from very early in the decade.

Note 5: Low Emission Vehicle Incentivisation (Tax foregone)

There are a number of elements to the Incentivisation of LEV adoption. As there is considerable detail behind each element, they are 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.

Low Emission Vehicle (LEV) Incentivisation Tax Foregone and Allocation (€m)

Year	Hybrids	Plug in Electric	Battery Electric	Total Tax Foregone
2020	5.7	12.1	21.3	39.1

Note 6: Public Service Provision Payments (PSPP)

This funding provides support for 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 includes funding for local link services under the Rural Transport Programme which is managed by the National Transport Authority.

This does not include payments to support the Essential Air Services Programme (i.e. the Public Service Obligation for air routes).

PSPP by operator for 2020

Operator	2020 PSPP Expenditure/Allocation (€m)
Dublin Bus	133.4
Bus Éireann	101.1
Iarnród Éireann (Irish Rail)	239.3
Other PSPP Operators	2.6
Luas	30.2
Other PSPP-related costs	26.9
Go Ahead Ireland	49.7
Rural Regular Transport Services	9.6
Fare Revenue Offset*	-16.6
Rural Transport**	15.0
Commercial Bus Operators Scheme***	32.3
Total	623.5

* 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.

***Temporary emergency PSO funding provided to certain key operators in the commercial market to mitigate the impact of the reduction in passenger numbers as a result of public health restrictions introduced to combat COVID-19.

Note 7: Public and sustainable transport investment Programme

This represents the State's investment in public transport initiatives. It also funds cycling and walking initiatives and sustainable urban transport measures in cities.

Investment programme for 2020

Main Programmes/Projects	Expenditure/Allocation €m
Heavy rail safety & development	312.4
LUAS Cross City	3.9
LUAS Green Line capacity enhancement	26.6
Other light rail	33.6
Bus fleet and BusConnects	104.1
Sustainable Urban Transport (traffic management and related projects) & Cycling/Walking	107.6
Accessibility	6.2
Ticketing and technology	29.6
Total	624.1

Numbers do not total due to rounding.

Heavy rail safety and development: In accordance with the requirements of EU law, the Department of Transport 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 and 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 through the City Centre. The project included the purchase of 7 additional new 55 metre trams.

LUAS Green Line Capacity Enhancement Project: This project was completed in March 2021 and consists of:

- 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.

The project will provide approximately 30% increase in capacity.

Other Light Rail: Luas Finglas is the proposed extension of the Luas Green Line from Broombridge to Charlestown, creating a new public transport connection between the communities of Charlestown, Finglas Village, Finglas west, St Helena's, Tolka Valley and the city centre.

In August 2020 a public consultation was held on the Emerging Preferred Route for Luas Finglas. A Strategic Assessment Report was prepared, and work is ongoing on a Preferred Route. The next step will be the submission of an Options Report. The Preliminary Business Case is expected to be ready for submission to the Department by Q1 2022.

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, 2019 and 2020 on the proposed network redesign and the core bus corridors. The final network redesign was published in September 2020 and roll-out of the first two phases is planned to begin in June and October 2021 respectively. Planning permission for the bus corridors will be sought in once Government has made a decision on approving the Preliminary Business Case.

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 Department of Transport 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: The Next Generation Ticketing (NGT) programme is a series of projects to renew the ticketing equipment and introduce new smarter methods of payment for customers, on all forms of transport in Ireland, starting with Bus Connects Dublin city bus services and expanding nationwide from there.

In 2020 the NTA completed a Pre-Qualification Questionnaire procurement process and, once the Preliminary Business Case has been approved by Government, tender documents will be issued for the project. When the project has been successfully rolled out across the bus fleet, it can then be implemented across the rail, Luas and Metro systems.

Note 8: Greenways

Funding of €40m was originally allocated to 10 Greenway projects in 2019. This funding was allocated at a rate of 60%, with local authorities to fund the remaining 40% from their own resources. The Impact of COVID-19 on local authorities' income due to the suspension of commercial rates income led the Department of Transport to increase the funding to 100%. There were further changes in design to allow for increased connectivity to towns and villages. One of the projects, Waterford to Bilberry, was subsequently taken over by the National Transport Authority.

Funding of €4.5m was allocated to 26 projects under the Carbon Tax Fund in July 2020. While not taken from ISGB proceeds, this funding is for pre-construction work such as feasibility, environmental screening, planning and design. It will ensure that a pipeline of Greenway projects is ready for construction over the coming decade. Funding is also likely to be made available to another tranche of projects over the next 18 months as we seek to create a connected network of Greenways.

Funding was allocated in Budget 2021 for the construction of the Greenway Bridge in Athlone, work is expected to commence in Q2 2021.

Planning permission was granted for the South Kerry Greenway. The South Kerry Greenway will provide a 32km Greenway off-road route overlooking Dingle Bay and will be one of the most attractive Greenways in Europe when completed in 2024.

Work continued on the Royal Canal Greenway in 2019 and 2020. The Royal Canal Greenway has been completed from Maynooth to Clondara in County Longford. The sections from Maynooth to Dublin City Centre will be completed over the next 3 years. The Preferred Route from Athlone to Galway is likely to be decided upon in 2021, this will then be constructed in 2022/23 and will see the completion of the coast to coast Galway to Dublin Greenway by the end of 2025.

Funding continued on the Royal Canal Greenway for ancillary works such as signage, seating, and some re-surfacing works. The works were completed in 2020 however the official launch of the Greenway was delayed until March 2021 due to the COVID-19 Pandemic.

Work on extending the Old Rail Trail (from Mullingar to Athlone) continued during 2020 as well as design and route options for the Athlone to Galway section of the Galway to Dublin Greenway.

Climate Change Adaptation

Note 9: Flood Risk Management

This expenditure supports investment in major flood works. These funds 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].

[A.] Capital Projects Overview – Key Programme Indicators

- The OPW has completed 48 flood relief schemes since 1995, costing over €400m, protecting 10,000 properties and avoiding damages to businesses and households of €1.8bn, approximately.
- All major flood relief works comply with the requirements of national and EU law, including carrying out 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. The OPW continuously strengthens the environmental performance of flood relief schemes with a wide range of initiatives such as a new process for all projects to formally input into a national process of collating best practice utilised, recording innovative environmental approaches used and capturing lessons learned.

In addition to almost 80 other projects currently under development, the following sections outline impacts of the remainder of the expenditure in the years 2019 and 2020.

[B.] Minor Flood Mitigation Works and Coastal Protection Scheme

- In addition, to the end of 2019, some €39m in funding provided to local authorities under the OPW's Minor Works Scheme has supported 580 projects, including a number of coastal flood and erosion risk management studies by Local Authorities, providing protection to some 7,100 properties from localised flood risk.

[C.] Nature Based Catchment Management

- The OPW is actively pursuing Nature-based Catchment Management (NCM) measures for future applications, to support multiple benefits for a range of objectives including flood risk management, water equality, sediment control and biodiversity. Current activities include:
 - Co-funding research to examine the effectiveness of soft engineering measures in agricultural lands and forestry, and funding Rivers Trusts to investigate the use of such measures to reduce flood risk and provide co-benefits.
 - assessing the potential for NCM as part of the potential solutions to managing flood risk for all future capital flood relief schemes
 - Co-chairing the National Working Group on Natural Water Retention Measures to identify integrated catchment management measures to provide benefits to multiple sectors.
- In accordance with the National Biodiversity Plan 2017-2021, flood relief schemes also directly implement 'Target 4.3: Optimised benefits for biodiversity in Flood Risk Management Planning' through assessment of the implications for biodiversity as part of the statutory environmental assessments and associated public consultations conducted.

[D.] Climate Action:

- In line with the National Adaptation Framework 2018, the OPW has developed a Climate Change Sectoral Adaptation Plan for Flood Risk Management, which was approved by Government in October 2019. The Plan identifies how climate change could impact on flooding, flood risk and flood risk management, prioritises these impacts in terms of urgency of action and degree of impact, and identifies the following adaptation objectives:
 - Objective 1: Enhancing our knowledge and understanding of the potential impacts of climate change for flooding and flood risk management through research and assessment
 - Objective 2: Adapting flood risk management practice to effectively manage the potential impact of climate change on future flood risk
 - Objective 3: Aligning adaptation to the impact of climate change on flood risk and flood risk management across sectors and wider Government policy
- The implementation of the actions set out in the Plan is ongoing, including:
 - The flood mapping programme for areas outside of those assessed under the CFRAM Programme, including mapping for future scenarios as well as current conditions, are nearing completion.
 - Pilot Scheme Adaptation Plans are under development for three flood relief scheme projects, while the requirement for such plans is included for all future projects .
 - funding ongoing research into the impacts of climate change on fluvial flood risk and the marine environment.
- The development of capital flood relief schemes now involves a specific requirement to assess the carbon cost of the project, which is taken into account in the development of the preferred option for the scheme.

[E.] Hydrology & Flood Forecasting

- The OPW is funding, and working with, MET Eireann toward the establishment of a National Flood Forecasting and Warning Service. A National Steering Group has been established to oversee the establishment of the Service
- The OPW is developing the Flood Estimation Methodology for Ireland (FEMI) programme, which will deliver the third generation flood estimation methodology for Ireland, building on the Flood Studies (1975) and Flood Studies Update (2004) for improved estimation of flood flows, including the effects of climate change.

[F.] Coastal Flood Risk Assessment

The OPW has developed, or is actively pursuing, a range of Coastal Programmes, including:

- The Irish Coastal Wave and Water Level Modelling Study (ICWWS, 2018) estimates Extreme Coastal Boundary Water Levels, associated with astronomical tide, storm surge and seiche/local wind set-up allowance, for the coast of Ireland, as well as two further future scenario extreme water level datasets associated with 1.5m (H+EFS) and 2.0m (H++EFS) of Sea Level Rise. This data will be used to produce updated coastal flood risk maps.
- The Tidal Storm and Surge Forecasting System (TSSF) provides twice daily forecasts of tide level and storm surge around the coast of Ireland enabling Local Authorities to provide timely warnings to the public and to provide a response to high tide events.
- The Pilot National Coastal Monitoring Programme for detailed coastal monitoring was established, with monitoring sites to be surveyed repeatedly to monitor change. This will be critical to understanding coastal processes in these areas and the management of risk in the future.
- Regional Coastal models are in development for a number of areas including Dundalk Bay and Tralee Bay to Galway Bay to improve wave and water level prediction.

[G.] Data Sharing

- Realtime water level monitoring – The OPW operates the <https://waterlevel.ie> website, which publishes realtime water level data and archived waterlevel and flow data for the national network of hydrometric gauges on rivers, lakes and the sea as an input to realtime flood warning services. It is also widely used by the public and Local Authorities, the ESB, Waterways Ireland and other bodies for monitoring river levels for planning water based activities sport and recreation. There were over 550,000 visits to the site in 2019.
- The OPW launched the Floodinfo web portal, www.floodinfo.ie in 2018 to disseminate the CFRAM Flood Maps and Plans. The portal has been enhanced on an ongoing basis to host additional data themes as well as being regularly updated with information on Flood Relief Scheme progress.
- Open Data - The OPW provides a variety of data sets as Open data via Floodinfo and, Waterlevel.ie and the government's Open Data Portal <https://data.gov.ie/>.

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.

In 2020, a new Woodland Creation on Public Lands scheme was introduced to encourage the planting of native tree species on suitable land owned by public bodies. The native woodlands created under this Scheme are non-commercial and for the benefit of the public in general to exist in perpetuity.

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 2020, 2,434 hectares of new forests were planted in Ireland by private landowners under the afforestation scheme. This compares to 3,550 hectares of new forests planted in 2019.

In addition, in 2020, 100 kilometres of forest roads were grant aided through the forest road scheme which will facilitate the mobilisation of biomass for wood products and energy.

During the Forestry Programme 2014-2020, which was extended to end 2022 in late 2020, total afforestation has exceeded 28,000 hectares and over 480 kilometres of forest roads were constructed. Total expenditure along with future commitments amount to over €340 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.

In 2020 €4.5 million in financial support was allocation for international climate action, an increase of €2 million on previous years.

Funding was given to the Green Climate Fund, the Adaptation Fund, the NDC Partnership and the IPCC.

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 DECC 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.

Note 14: Climate initiatives

Funding provided under this programme is to engage research work to support the delivery of the actions contained in the National Mitigation Plan (2017). It also provides funding to support the National Dialogue on Climate Action. The aim of the dialogue is to raise awareness, engagement and motivation to act on the challenges presented by climate change, to help people to discuss, deliberate and maximise consensus on appropriate responses to the climate challenge and to establish networks for people to meet periodically to consider evidence-based inputs on the economic, social, behavioural, environmental and public aspects of climate and energy policy.

Note 15: National heritage (National Parks and Wildlife Service)

The National Parks & Wildlife Service (NPWS) of the Department of Housing, Local Government and Heritage (DHLGH) 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.

DHLGH, alongside the Heritage Council, provide funding for the National Biodiversity Data Centre. The National Biodiversity Data Centre is a national centre for the collection, collation, management, analysis and dissemination of data on Ireland's biological diversity. Biodiversity data are a key requirement for understanding our natural surroundings, for tracking change in our environment and for gaining a greater insight on how we benefit from, and impact upon, the ecosystem goods and services provided by biological diversity and in 2020 held 16,500 species and over 4.4 million records.

Note 16: Peatlands restoration and management

The NPWS supports the Peatlands Council which was charged by Government to develop the National Peatlands Strategy, 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](#).

Functioning peatlands capture (sequester) carbon from the atmosphere and store it in the form of peat and vegetation. Restoring and rehabilitating Ireland's peatlands will ensure that the carbon content of the peat within each bog is stored in perpetuity. Currently it is estimated that peatlands emit ca 5-7 Mt CO₂ per year, which equates to approximately 10% of the national greenhouse gas emissions as reported annually by Ireland's environmental protection agency. It is essential therefore to keep the carbon stored in the ground and restore and rehabilitate their hydrological balance to return degraded peatlands to sinks or carbon neutral systems.

Significant government measures are now underway in Ireland to halt and reverse this loss of all peatlands through sustainable management, rehabilitation and restoration. The National Parks and Wildlife Service of the Department of Housing, Local Government and Heritage are leading on this programme for nature based change by restoring over 22,000 hectares of protected raised bog. Restoration measures on raised bogs involve the insertion of peat or plastic dams to block surface water drains to restore more natural physical conditions and the rewetting of the bog to raise water levels close to the bog surface to restore peat forming conditions and improve the hydrological functioning of the bogs.

Ireland's raised bog network is monitored to account for ecological, hydrological and greenhouse gases fluxes. Climate chambers are used to monitor greenhouse gas emission fluxes at a localised, habitat level whilst eddy covariance flux towers are used to monitor greenhouse gas exchanges over a slightly, wider environmental footprint. There is also ongoing fluvial monitoring which measures both hydrological and carbon balances within several peatland sites.

Renewable Energy

Note 17: 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 projects to the value of €17 million during 2019 and 2020. The 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 €35M.
- 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.

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 18: Explanation and Potential Key Environmental Impact Indicators

Rural Water Programme

The Programme covers a number of funding measures which are all aimed at environmentally sustainable outcomes:

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

Note 19: Capital Expenditure provided to Irish Water for the provision of domestic water services

Irish Water is a fully publicly owned, regulated, commercial State body with responsibility for the operation and maintenance of Ireland's public 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 network.

This involves treating 1.8 billion litres of drinking water each day and treating the wastewater produced. Irish Water's public water and sewer networks require a multi-billion euro investment programme. The key challenges for Irish Water 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);
- Develop the resilience required to cater for greater frequency of extreme weather events; and
- Maintain the current aging asset base and rectify the legacy issues

This has meant Irish Water's capital expenditure in 2020 was set across three themes.

- 1) Quality: bringing and maintaining public water and wastewater services to acceptable international benchmarks and ensuring improved compliance with public health and environmental standards;
- 2) Conservation: prioritising improved resource management, abstraction control, source protection, tackling leakage and encouraging behavioural change; and
- 3) Future proofing: supporting economic and social progress and improving capacity and resilience.

Roughly 50% of Irish Water capital expenditure in 2020 was under the "Quality" heading, 32% for "Future Proofing" and the remaining 18% was spent on "Conservation." 2020 investment includes the Blanchardstown Regional Drainage Scheme and the Cork Lower Harbour Main Drainage Project.

The Blanchardstown Regional Drainage Scheme (BRDS) is an investment of approximately €88m by Irish Water and 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. The existing wastewater network around Blanchardstown was constructed in the 1970s and since then the area it serves has expanded considerably. The wastewater network in Mulhuddart and Castleknock, as well as towns in Meath including Dunboyne, Clonee, Ashbourne and Ratoath, are all being upgraded as part of the project. The delivery of BRDS, which includes the construction of approximately 3.2km of pipeline installed using trenchless tunnelling techniques, will expand the capacity of the wastewater network and will help to ensure that both Blanchardstown and surrounding Dublin/Meath areas are able to sustain future residential and commercial development along with long-term social development. Furthermore, the completion of the project will reduce the frequency and volume of untreated wastewater overflows reaching the River Tolka, protecting habitats and ecosystems in the River Tolka and Dublin Bay.

Sample of Irish Water Projects

Irish Water Projects	2020 Expenditure €m
GDRDP: Blanchardstown Sewerage Scheme	35.4
Cork Lower Harbour Main Drainage	28.5
Ringsend Wastewater Treatment Works	27.3
Vartry Water Supply Project	27.2
Upper Liffey Valley Sewerage Scheme 2B	18.7

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](#). Although the majority of Irish Water's capital funding comes from the Exchequer on behalf of the domestic sector, Irish Water's non-domestic sector partially finances Irish Water's investment programme through a combination of customer funded capital expenditure for new connections and the surplus generated from the provision of services to Irish Water's non-domestic customers. The values in respect of individual projects referenced above refer to total expenditure on these projects.

Case studies of allocations from Irish Sovereign Green Bonds

A. Flood Relief Scheme Clonakilty

Background

The Office of Public Works (OPW) is Ireland's lead agency for flood risk management. This role includes managing Ireland's flood risk assessment and management programme (in line with the European 'Floods' Directive); delivery of the national Capital Flood Relief Programme (in partnership with Local Authorities around the country); maintaining the national network of Arterial Drainage Schemes, and providing funding and technical support to local authorities for minor flood mitigation works.

In 2010, the OPW embarked upon the National Catchment-based Flood Risk Assessment and Management (CFRAM) Programme - the largest study of flood risk undertaken in the State. This programme aimed to provide a comprehensive picture of potentially significant areas of flood risk nationally, and recommend measures to manage that flood risk effectively and sustainably. The Programme focussed on 300 communities, referred to as 'Areas for Further Assessment' (AFAs). These were identified through a national screening exercise and include approximately 80% of properties at risk from rivers and the sea; the primary sources of flooding in Ireland. Ninety of these areas are coastal.

Flooding in Clonakilty, West Cork

Clonakilty has been flooded by its rivers and the estuary on numerous occasions, including significant flooding in June 2012. This severe flooding prompted work for the town as part of the national Catchment-based Flood Risk Assessment and Management Programme to accelerate and assess the risk and identify a viable flood relief scheme.

The OPW initiated the River Fealge (Clonakilty) Drainage Scheme in 2013. In January 2014, engineering consultants were appointed to take the Scheme forward to construction stage, and construction commenced in April 2018.

Outline of the Scheme:

The scheme includes engineered river flood defences throughout the town centre; and tidal defences, including road raising, along the estuary. The scheme also relies on reducing the size of floods by providing a flow control structure and natural storage area for heavy rainfall upstream of the town.

The Clonakilty Flood Relief Scheme has been built to allow for operational and structural variations into the future to allow for predicted increases in flood risk due to climate change. In summary, the scheme comprises:

- Upstream Flood Storage Embankment (including access road) and flow control structure upstream of the town;
- Flood defence walls in the Town Centre, incorporating sections of glass flood defence walls and windows, and including flood defence parapets and sealing of deck opes on a number of bridges;
- Flood defences along the estuary, including walls incorporating sections of glass flood defence walls, road raising above the flood level along Clonakilty Bay, with associated retaining structures, and a flood defence embankment further along the Estuary;
- Flood defence works on channels and tributaries in other locations around the area; including flood defence embankments, repair/replacement works to the river channel; banks, walls and headwalls with river bank infill works; drainage channel piping, trash screen, etc.
- Storm water sewers, and four (4x) pumping stations.

During the construction of the scheme, the project team worked in close collaboration with the local community and business representatives - for example, by providing a shuttle bus service and additional car park during the works, and to ensure that the economic activity of the town was acknowledged by ceasing the works during the Christmas holiday period.

Outcomes:

The completed scheme protects almost 300 properties, including 150 residential and 146 commercial premises. The flow control structure has already been deployed on a number of occasions during and since construction, including during the combined heavy rainfall and extreme tide event at the end of September 2019, and the extreme rainfall events of late February 2021, resulting in the prevention of hundreds of thousands of euro worth of damages already. A strong emphasis, through collaboration with Cork County Council, is to improve the public spaces, roads and public realm in the town.



Inside tidal defences and public space enhancement

The scheme's finishes are sympathetic to the surrounding environment; with strong focus on natural stonework and locally-sourced architectural finishes. The Project, led by the OPW, reached substantial completion in Spring 2021.

B. Sustainable Energy Authority of Ireland (SEAI) Community Energy Grant Scheme

The information in this case study relates to 2019, being the latest information on the scheme to hand. It is indicative of the environmental benefits of the scheme which continued through 2020.

In 2019, SEAI offered grant support to 57 community energy projects to a value of over €60 million. This helped support the upgrade of over 650 homes and 450 community buildings and businesses right across Ireland. The following three sample beneficiary projects demonstrate the benefits and wide reach of the scheme.

(i) The Birches Alzheimer Centre, Louth: 82,619 kWh saving per annum

The Birches Alzheimer day care centre is located in Dundalk, County Louth. The respite centre is a much-needed resource for families in the community.

The Alzheimer centre faced the challenge of keeping their old building warm. An energy audit on their building before it was upgraded showed that the heating bill accounted for 70% of the centre's overall energy costs. As the centre relies heavily on donations of up to €100,000 each year, reducing this bill eases some of the financial pressure and allows them to reallocate resources to the care of patients.

The Birches centre undertook energy efficiency upgrades costing almost €80,000 with the help of almost €40,000 in SEAI funding. Upgrades included insulating the attic, roof and walls which is essential to keep heat from escaping. An air to water heat pump system was installed to provide renewable heating. A solar photovoltaic system provides renewable electricity. The centre has seen energy savings of 82,619 kWh per annum, which is the equivalent of the energy used in four homes.

The upgrades have contributed to the quality of life experienced by patients.



Image source: SEAI

(ii) The Rediscovery Centre, Dublin: 37,000 kWh saving per annum

The Rediscovery Centre is a state-of-the-art sustainability and reuse centre based in Ballymun, North Dublin. The centre hosts education workshops for all ages and a shop and café. It works with people on community-employment schemes to recycle paint, recondition bicycles and furniture, and upcycle unwanted clothes into eco-fashion.

The Rediscovery Centre is located in the repurposed Boiler House in Ballymun. One of the buildings previously held the water for the 1960's district heating system. The building has undergone a major green revamp achieving an A-rating, which is rare for a retrofitted building. This project used as much salvaged materials as possible and renewable technologies have been incorporated into the design.

As part of the energy upgrade, the reservoir was fitted with high levels of internal insulation to reduce heat loss. An air source heat pump was installed to provide a renewable source of heating. Energy efficient LED lights were put in to reduce electricity consumption. In addition, 6 kW of solar PV was installed to increase the level of onsite renewable electricity generation at the centre. The work cost €75,000 and as a community-based, not for profit organisation it received a 50% grant from SEAI.

The centre has seen energy savings of over 37,000 kWh per annum, which is the equivalent of heating two homes for a year. It is also making energy savings of €6,300 each year.

The usability and comfort of the space has improved significantly and resulted in the creation of an entirely new, flexible community building. The retrofit has allowed the Centre to run more workshops and deliver events for larger numbers. It has increased visitor numbers and enhanced the visitor experience.



Image source: SEAI

(iii) Harbour View Road, Cork: 1,436,455 kWh saving per annum

Harbour View Road in Cork city has 72 houses, with a mix of privately owned and council housing. There were 46 fuel-poor homes. The houses were upgraded as part of a regeneration project with an aim to bring the homes up to a B2 rating or better.

The residents had a wide variety of needs. For example, several elderly residents had oxygen tanks and slept in the downstairs living rooms of their homes. Stoves could not be fitted in these homes as it would be a huge health and safety issue. Wheelchair access was needed in many cases and the presence of a carer was required for residents with dementia or Alzheimers. Several occupants required personal attention to feel at ease with the impending works.

An initial survey was completed to figure out what measures were needed to improve the energy efficiency of each house. Each home was insulated to prevent heat from escaping. This included external wall insulation, dry lining sloped ceilings, attic insulation, and window and door replacements.

The next step was to provide renewable sources of energy. Air to water heat pumps were installed to provide heating and solar PV panels provide electricity. Lightbulbs were replaced with energy efficient LED bulbs. Additional measures, for example, fixing electrical issues, further asbestos removal, and upgrading old steel water tanks, were also needed. The houses went from an average E2 rating to between a B1 and A3 rating after works. The upgrades cost €2.7 million in total and SEAI supported with €1.3 million. The homes have seen energy savings of 1,436,455 kWh.

The residents were delighted with the results, with lower heating bills and marked improvement to their standard of living and the comfort in their homes. Many residents saw improved mental and physical health as a result of cosier homes, free from damp and mould. Post-works residents were re-inspired to invest in the maintenance of their homes. The care and attention to the upkeep of the homes was visible as the residents some of whom lived there for over 40 years expressed a huge amount of house and community pride.



Image source: SEAI



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