



Codema
Dublin's Energy Agency

CODEMA ANNUAL REPORT 2018



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01. DIRECTOR'S FOREWORD

“Codema has been quick to respond and support the Dublin Local Authorities in the uptake of the financial and other benefits arising from new national initiatives that support local energy projects [and] was instrumental in securing funding for two local authority district heating projects in the first call of the government’s Climate Action Fund.”

The defining issue for Codema in the year 2018 has undoubtedly been climate action, heralded through a new political emphasis that was prompted by the 2016 Programme for Government and the 2017 Citizens’ Assembly report.

This has led to a more supportive national framework for local climate actions, on several fronts. Firstly, by the creation of a new national Climate Action Fund, of at least €500 million, under the National Development Plan 2018-2027; and, secondly, by the establishment of four Climate Action Regional Offices, one of which is specific to the climate challenges of the Dublin Region. In addition, the year 2018 saw the enhancement of SEAI programmes such as the Research, Development and Demonstration programme, which supports Codema’s Energy Master Plan for the Dublin Region, the continuation of a national District Heating Working Group that is providing a framework for the development of the Dublin City and South Dublin district heating schemes, and the establishment of the Oireachtas Joint Committee on Climate Action in September 2018 that will make further recommendations to the government in 2019, based on the Citizens’ Assembly report.

Codema has been quick to respond and support the Dublin Local Authorities in the uptake of the financial and other benefits arising from new national initiatives that support local energy projects. For example, Codema was instrumental in securing funding for two local authority district heating projects in the first call of the government’s Climate Action Fund. There were seven successful funding applications (out of 97 bids) approved in the first round of the fund in November 2018, of which the largest amount of up to €20 million was awarded to the Dublin District Heating System (Dublin City Council). On behalf of the Project Team, Codema supported and supplied the energy data and models required to complete the application. For the Tallaght District Heating Scheme (South Dublin County Council), which was awarded €4.5 million, Codema drafted the entire application and has already delivered some key milestones including an Outline Business Case and Stage 1 of the procurement process.

New skills are being continually developed in-house in Codema to help implement such larger projects. These skills are in the areas of detailed financial and business case appraisals, compliance with the Public Spending Code, State Aid and public procurement rules. Many of these skills, along with technological know-how, are acquired through EU funded projects, with other cities and centres of excellence in Europe. In particular, Codema is leading the €11.5m HeatNet NWE project to promote the roll-out of 4th Generation District Heating and Cooling across North-West Europe. This innovative technology integrates heat, electricity and energy storage to achieve an overall smart energy system, combining high energy efficiency, high shares of renewable energy and waste heat resources.

As already stated, climate action has been a defining issue for Codema in 2018. A major milestone in Codema’s work programme for the year has been the completion of four draft Climate Change Action Plans – one each for Dublin City, Dún Laoghaire-Rathdown, Fingal and South Dublin County Councils. In advancing the action plans to a statutory public consultation process at the December Council meetings, the councillors were unanimous in their high praise for the plans.

Throughout 2018, Codema’s Communications Team worked on preparing and developing these Climate Change Action Plans, along with the development of a public engagement strategy for the public consultation process in 2019. This included a detailed event plan for four regional public information events to engage the public on the Climate Change Action Plans and encourage submissions, along with the creation of an online platform (www.dublinclimatechange.ie), which gives an

overview of the environmental, economic and societal context in which the plans have been developed.

The Home Energy Saving Kit scheme had another very successful year in 2018, with major expansion to the majority of libraries in Dublin and also to selected libraries across Ireland. The spring of 2018 saw the completion of almost one year's work in gathering feedback from the users of the Home Energy Saving Kit. 250 surveys in total were collected from users of the kit such as library patrons, local authority staff, and those involved in SEAI's Sustainable Energy Communities. Particular emphasis was placed on examining the potential of the kits to encourage behaviour change in the home in terms of both everyday energy use and investment in home energy upgrades.

As an essential core function, Codema has continued to monitor and report on the local authorities' own energy use and to make recommendations on how best to achieve the 33% energy efficiency improvement target by 2020.

Among the most successful measures implemented include the retrofitting of three leisure centres in Dublin City Council using an innovative Energy Performance Contract, whereby the contractor guarantees the energy savings over an eight-year period. The latest figures show that from December 2016 to August 2018, the project has achieved cost savings of €318,281 and energy savings of 38%. Due to its success, Codema helped to procure a contractor in 2018 for a second EPC in Dublin City Council and work will begin on this project in 2019. Similar projects are also being explored by Codema for Dún Laoghaire-Rathdown, Fingal and South Dublin County Councils.

I would like to conclude by expressing my appreciation for the continued support that Codema has received from the Dublin Local Authorities. This has allowed Codema to successfully execute our work programme for 2018 and to help meet the local energy and climate challenges of the Dublin Region. I would further like to acknowledge the financial support that Codema received from the European Union and the Sustainable Energy Authority of Ireland through their energy and climate programmes.

Finally, I would like to take this opportunity to thank the Chief Executives, Directors of Services, Executive Managers and all the staff across the four Councils, with whom we had the pleasure to work with in 2018. Most importantly, I would like to thank all the staff at Codema for their dedication and hard work in delivering all of the outputs described in this report.



Gerry Wardell

Gerry Wardell
Director, Codema

02. ABOUT CODEMA



Vision, Mission and Values

Codema was set up as a not-for-profit limited company by Dublin City Council in 1997 under the SAVE II Programme of the European Union (EU). It was one of 14 local energy agencies set up around Ireland to help local authorities meet their energy performance targets through professional development and implementation of best practice. In 2009, Codema also became energy adviser to Dún Laoghaire-Rathdown, Fingal and South Dublin County Councils.

Our role is defined around the core function of supporting the local authorities in their own sustainable energy use. A second role is engaging with EU and nationally-funded energy programmes to bring innovation to the Dublin Region. A third and increasingly important role is to increase energy and climate awareness among citizens and energy stakeholders in Dublin. Over the years, these three strands have become increasingly intertwined and integrated into a comprehensive, local and regional service for energy and climate change.



Vision

Codema's vision for Dublin is of a city and county region powered by clean energy, with zero polluting emissions and strong resilience to flooding and other impacts of climate change. There will be affordable heat for all citizens in their homes, through excellent insulation and efficient energy from renewable sources. Good mobility will be provided by a public transport infrastructure that is independent of fossil fuels. Electricity will be fully decarbonised, and any waste heat from industrial processes will be recycled for heating and cooling commercial and residential buildings.



Mission

Codema is committed to working with the Dublin Local Authorities (DLAs) to improve the energy efficiency of Dublin in order to reduce the region's CO₂ emissions and achieve the ambitious climate and energy targets known as "20-20-20" targets. These are:



A 20% reduction in EU greenhouse gas emissions from 2005 levels



Raising the share of EU energy consumption produced from renewable resources to 20% (adapted to 16% for Ireland)



A 20% improvement in the EU's energy efficiency



In line with the NEEAP, we are also committed to achieving a 33% reduction in the local authorities' energy use for their own operations



BEYOND 2020

A 40% reduction in GHGs by 2030, in line with the EU Covenant of Mayors for Climate and Energy and the Councils' Climate Change Action Plans



The Steering Committee

Codema reports to a Steering Committee whose members are appointed by the Chief Executives of Dublin City Council (DCC), Dún Laoghaire-Rathdown County Council (DLRCC), Fingal County Council (FCC) and South Dublin County Council (SDCC). This Steering Committee meets on a quarterly basis to draw up and review the annual work programme. At these meetings, Codema reports on the progress of actions, responds to any requests for specific work at departmental level, and keeps the DLAs abreast of the latest developments on energy and climate change policies in Ireland and abroad.



In 2018, the Steering Committee was made up of the following members from the Dublin Local Authorities and Codema:

 <p>Comhairle Cathrach Bhaile Átha Cliath Dublin City Council</p> <p>Dick Brady Assistant Chief Executive Environment and Transportation</p> <p>John Ryan Senior Executive Officer Corporate Services</p>	 <p>Comhairle Contae County Council</p> <p>Frank Austin Director of Infrastructure and Climate Change</p>	 <p>Comhairle Contae Fhine Gall Fingal County Council</p> <p>Gilbert Power Director Water Services and Environment Department</p>	 <p>Comhairle Contae Átha Cliath Theas South Dublin County Council</p> <p>Eddie Conroy County Architect</p>	 <p>Gerry Wardell Director</p> <p>Edel Giltenane Executive Manager</p> <p>Joe Hayden Senior Executive Engineer</p>
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02. ABOUT CODEMA

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The Codema Team

Codema currently employs 13 staff who have qualifications and experience in the areas of Engineering, Sustainable Development, Sustainable Infrastructure, Energy Planning, Architecture, Communications, Marketing, Project Management and Financial Administration. This allows the team to deliver its key services of Energy Monitoring and Management, Energy and Climate Awareness, Energy Planning and Policy, Project Management and Match Funding.





Gerry Wardell - Director
Certificate in Advanced Negotiation
Certificate in SME Management
PhD in Experimental Physics



Edel Giltenane - Executive Manager
Certificate in SME Management
PMI Project Management Professional (PMP)
MSc in Environmental Resource Management
BSc in Earth Science



Paula Hemenstall - Secretary
Sage Training Programme in Tas Books



Kevin Craven - Project Finance Manager
Diploma in Financial Services
Certified Project Management Diploma
BA in English, Sociology and Politics



Joe Hayden - Senior Executive Engineer
Certificate in Public Procurement
Certified Measurement and Verification Professional (CMVP)
MSc in Sustainable Development
BA/BAI in Mechanical and Manufacturing Engineering



Dec McCormac - Project Manager
PMI Project Management Professional (PMP)
Diploma in Public Procurement
MSc in Sustainable Development
BA (Intl) in Geography and Archaeology



Donna Gartland - Senior Energy Planner
MSc in Sustainable Energy Planning and Management
BEng in Energy and Environmental Engineering



Suzanne Fitzpatrick - Communications Manager
Certificate in Internal Communications
Diploma in PR and Event Management
BA in Journalism



Brian Connolly - Energy Manager
BSc in Sustainable and Electrical Control Technology
BSc in Electrical Services and Energy Management
Qualified DEC Assessor



Rebecca Cachia - Civil Engineer
MEng in Sustainable Infrastructure
B.E. & A. (Hons) in Architecture and Civil Engineering



John O'Shea - Energy Systems Analyst
Post-Graduate Diploma in Sustainable Energy
CIBSE-certified Heat Networks Consultant
BEng in Civil Engineering



Katia Tikhoniouk - Communications and Project Coordinator
Diploma in Graphic Design and Desktop Publishing
Certificate in Project Management
Diploma in Digital Marketing
MA in Architecture
BA in Architectural Science



Eoin Ahern - Energy Manager
MEngSc in Sustainable Energy Research
MEngSc at UCC - Renewable Natural Gas
BE in Mechanical Engineering
Qualified BER Assessor

02. ABOUT CODEMA

(CONTINUED)

CORE COMPETENCIES



ENERGY MONITORING AND MANAGEMENT

Monitoring and Reporting
 Energy Databases
 Energy Surveys
 Display Energy Certificates
 Renewable Energy
 Energy Efficiency Upgrades
 Energy Performance Contracting
 Measurement and Verification
 Energy Management System Implementation



ENERGY AND CLIMATE AWARENESS

Home Energy Saving Kits
 Energy and Climate Awareness Programmes
 Staff Engagement
 Educational Workshops and Events
 Information Events
 Promotion of Local Authority Energy and Climate Change-Related Projects



ENERGY PLANNING AND POLICY

National and International Energy and Climate Change Policy
 Climate Mitigation and Adaptation
 Sustainable Energy Action Plans
 Spatially-Led Energy Modelling
 Techno-Economic Energy System Analysis
 Detailed Energy System Financial Appraisals
 Energy Master Planning
 District Heating Expertise
 Advice on Development Plans and Policy Papers



PROJECT MANAGEMENT

Development of local Climate Change Action Plans
 Local and EU Project Management
 EPC Facilitation
 Procurement Facilitation



MATCH FUNDING

Match Funding from European Programmes
 European Co-operation
 National Funding Applications

03. WORK PROGRAMME 2018



ENERGY MONITORING AND MANAGEMENT

Monitoring and Achieving Public Sector Energy Targets

Codema works with the Dublin Local Authorities (DLAs) to help them monitor and achieve their public sector energy efficiency targets, which have been set at a 33% reduction in energy consumption by the year 2020. These targets have been set through successive National Energy Efficiency Action Plans (NEEAPs), under the European Energy Efficiency Directive (2012/27/EU). In the third NEEAP of 2014, this 33% target was reiterated as a central pillar of our national energy efficiency policy.

In January 2017, the government launched the Public Sector Energy Efficiency Strategy. The aim of the strategy is to ensure that senior leadership and accountability on energy efficiency are core to the local authorities' objectives. Senior managers in over 300 public bodies have been given the responsibility of ensuring compliance with existing energy performance reporting and monitoring requirements, and embedding structured energy management in their organisations. Throughout 2018, Codema worked with the relevant DLA Energy Performance Officers (EPOs) to help them fulfil this role, and will continue to do so annually.

The aim of the NEEAP is for the public sector to lead the way in relation to energy efficiency and help achieve the 33% energy reduction target "through strong, committed action".



Photo source: YvonneM (WikiCommons)



2020 Energy Efficiency Targets

European

European Energy Efficiency Directive (2012/27/EU)
20% energy reduction

National

National Energy Efficiency Action Plan (NEEAP)
33% energy reduction

Local

Annual Reporting of Energy Efficiency Data under S.I. 542 of 2009
(restated under S.I. 426 of 2014)



2030 Energy Targets

Covenant of Mayors for Climate and Energy / Climate Change Action Plans
40% reduction in GHGs

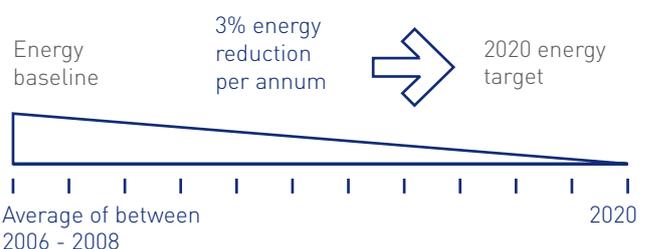
Management of Public Sector Monitoring and Reporting

Under S.I. 426 of 2014, the DLAs have an obligation to report annually on their energy performance. In practice, this annual reporting entails compiling full data of their previous year's energy consumption. This comprises mainly of MPRN data for all electricity accounts and GPRN data for all natural gas accounts, along with the annual consumption data for non-metered public lighting, heating oil and transport fuels.

In 2018, Codema supported DCC, FCC and SDCC with this statutory reporting to the national energy Monitoring and Reporting (M&R) system operated by the Sustainable Energy Authority of Ireland (SEAI) on behalf of the Department of Communications, Climate Action and Environment (DCCAE).

The M&R system is useful for tracking the individual local authority's progress towards the 2020 target, compared to the baseline year, which is an average of between 2006 and 2008. This means that the DLAs must reduce their annual energy use by approximately 3% each year up to 2020, from the baseline year.

Yearly Energy Targets



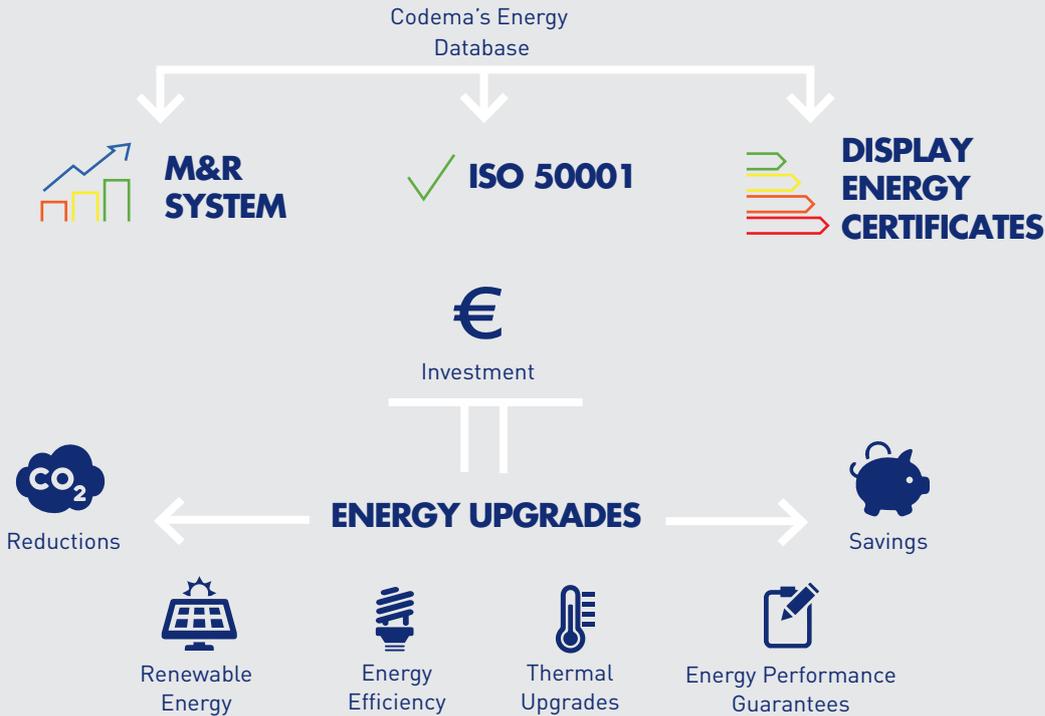
03. WORK PROGRAMME 2018

ENERGY MONITORING AND MANAGEMENT (CONTINUED)

Codema can assist the DLAs with the following Energy Management Processes



ENERGY SURVEYS OF BUILDING GROUPS





Energy Reviews

In 2018, Codema produced the annual Energy Reviews for DCC, FCC and SDCC. These were based on 2017 data and aimed to help the DLAs in their energy planning programmes, in order to meet the public sector 2020 energy targets. The Energy Reviews highlighted the total amount of energy that the Councils consumed throughout 2017, along with the total cost and carbon emissions associated with this energy use in the same year. This data allowed Codema to develop a specific list of energy-saving recommendations, which will guide each DLA on how best to tackle their Significant Energy Users (SEUs) and meet public sector energy targets.

Codema is currently updating these Energy Reviews to account for 2018 data, and will include an Energy Review for Dún Laoghaire-Rathdown County Council (DLRCC). These reviews will once again provide a breakdown of each local authority's energy use in 2018, highlighting where energy was used, what drove its consumption, and where the greatest energy savings can be achieved.

ISO 50001

Codema will work with the DLAs and meet regularly in 2019 to coordinate all actions towards reaching ISO 50001 accreditation and meeting the 2020 energy efficiency target. Fingal County Council and South Dublin County Council have signed up to SEAI's ISO 50001 masterclass. This masterclass aims to guide the local authorities towards achieving ISO 50001 accreditation. Codema is currently aiding both local authorities in completing outputs from these masterclasses and currently sits in on their energy team meetings.

Dublin City Council completed SEAI's masterclass in 2016 and Codema is currently aiding the Council towards accreditation by the end of the year. Dún Laoghaire-Rathdown County Council achieved ISO 50001 accreditation in 2016 on the back of SEAI's initial ISO 50001 masterclass. Codema has agreed a work programme for 2019 with DLRCC, which will aid the Council in continuously improving its energy management system.

Energy Oversight Committee

In 2018, Codema helped to facilitate an Inter-Departmental Energy Oversight Committee meeting for Dublin City Council. These meetings aim to identify and cost potential projects in areas such as Public Lighting, Offices and Depots, Housing, Fire Stations, Sports Centres, Libraries, and Transport, in order to help the Council stay on track of 2020 energy targets. Projects were identified during the Energy Review process and an action plan was established, in order to guarantee that the gap-to-target is met by the 2020 deadline. The projects identified included a boiler replacement proposal for the O'Brien Institute of the Dublin Fire Brigade (DFB). Codema worked with the DFB to develop a contract that holds the designer and installer of the system under a performance guarantee. Codema also drafted a proposal to examine the potential energy savings from the retrofit of all the landlord lighting in the social housing complexes in the city. This proposal was presented to the Electrical Services Department and a pilot in Pearse House will be initiated after the summer of 2019. Codema will continue to work with the Energy Oversight Committee in 2019, and will continue to develop an energy management system within DCC, as part of this process.

03. WORK PROGRAMME 2018

ENERGY MONITORING AND MANAGEMENT (CONTINUED)

Display Energy Certificates (DECs)

The information from Codema's energy database and energy surveys is used to prepare Display Energy Certificates for each local authority public building with a floor area greater than 250m², as required under the regulation S.I. 243 of 2012.

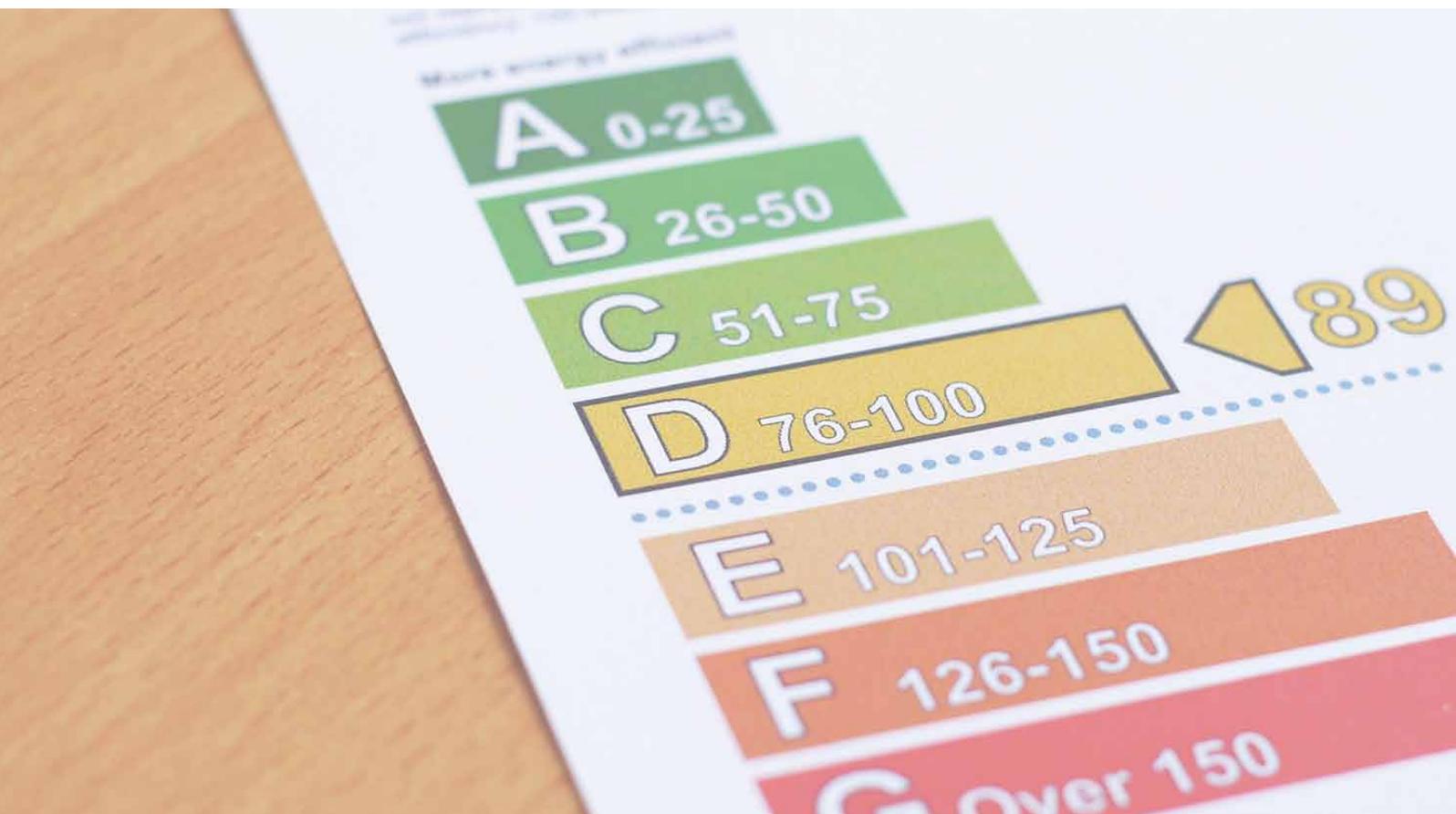
Codema hired an additional Energy Manager in 2018, which enabled us to survey and certify a greater number of local authority public buildings during the year. In total, Codema assisted DCC, FCC and SDCC with the annual inspection and certification of 77 public buildings in total in 2018. This information was entered into the SEAI system for the local authorities, and Codema issued certificates to the managers of all of these buildings, along with information on how much energy would need to be saved in the following year to improve their energy rating. Each building manager also received a copy of Codema's 'Guide to Display Energy Certificates in Local Authority Buildings' to accompany these certificates and encourage direct action.

Display Energy Certificates are a form of Building Energy Rating for public buildings, which give an indication of their energy efficiency.

Energy Audits and Analysis

Throughout 2018, Codema conducted site visits to 10 local authority facilities on behalf of DCC, FCC and SDCC in order to generate energy recommendations for the upgrade of these sites. Within this, Codema carried out energy audits on six large local authority facilities, which had been identified as Significant Energy Users (SEUs). Energy audit reports, which outlined various recommendations for each of these sites, were subsequently produced and issued to the relevant facilities managers.

These included Codema carrying out an energy audit on DCC's Eblana House administrative and laboratory facility. A detailed report, including a number of recommendations, was completed and presented to DCC. The energy audit report for Eblana House highlighted a large energy spend for the facility, which was due to the use of lab facilities within the building.



Energy audit reports were also generated for the Joinery Workshop, Maple House and Parkgate Hall, which identified that significant energy savings could be achieved in these facilities with the upgrade of the lighting systems with LEDs, boiler replacements and the installation of solar photovoltaic (PV) systems. The energy audit reports were presented to DCC and project proposal documents were produced. These projects have been included in DCC's action plan and are due to start in late 2019, using the same procurement method used for the O'Brien Institute (see overleaf).

Codema also carried out energy audits on South Dublin County Council's two largest administrative buildings, County Hall in Tallaght and the Civic Offices in Clondalkin. The energy audit reports identified that significant energy savings could be achieved with the retrofit of LED lighting within the facilities. The projects have been put on SDCC's register of opportunities and Codema are waiting on approval from the Council to proceed with the project.

An energy study was also completed for the recently-opened Dublin City Farm in St Anne's Park, Raheny. The report investigated the potential for the site to become self-sufficient from an energy perspective, and included a preliminary analysis based on the projected energy demand for the site. A Measurement and Verification report was also prepared for

the Rediscovery Centre in Ballymun, as part of its reporting requirement under the WISER LIFE EU-funded project. This involved detailed analysis of the energy consumption of the facility since its opening in January 2017. The energy saving calculations in this report were carried out in accordance with the International Performance Measurement and Verification Protocol (IPMVP).

In 2019, we will continue with this auditing process and will use the results of these audits to see where energy-saving works can be best implemented across local authority buildings. A number of additional facilities have been acquired by DLRCC in the last year, so these will all need to be surveyed to allow for inclusion in the M&R system.

Project Proposals / Feasibility Studies

Once completed, energy audit reports carried out by Codema are presented to the DLAs. Based on the findings of these reports, the DLAs may wish to explore the possibility of implementing the recommendations. Codema will then put together a project identification and proposal document, which gives a brief description of the project and displays the findings from the financial analysis carried out to ensure the measures are financially viable and that there is a cost benefit to the project. This was the case for the Joinery Workshop, Maple House and Parkgate Hall, mentioned in the previous section.



03. WORK PROGRAMME 2018

ENERGY MONITORING AND MANAGEMENT (CONTINUED)

Codema was also approached by the Dublin Fire Brigade property maintenance manager to identify the best options for the replacement of the boilers within the O'Brien Institute, which are coming to the end of their lifespan. Instead of upgrading the boilers to a more energy-efficient model, Codema prepared a project proposal on the feasibility of installing a more carbon-neutral alternative, such as a heat pump, condensing gas boiler and micro CHP hybrid system, to reduce both the electrical and gas consumption within the facility. From this project proposal, the installation of a condensing gas boiler was agreed.

Once the project was approved, Codema then prepared the tender documentation. The procurement method used was an Energy Performance Guarantee contract, which will incentivise the contractor to remain involved with the project until savings are established, thereby reducing the risk to the Council. This project is expected to go to tender in the summer of 2019.

In addition, Codema also carried out a number of feasibility studies on DLA facilities, which included a feasibility report to examine the potential for renewable energy production on the now closed Arthurstown Landfill site in County Kildare, which is operated by South Dublin County Council. The analysis examined the potential for biogas production, wind generation

and solar PV generation on the site. These options are currently being evaluated by the Council.

The Transformation Unit in Dublin City Council is working with all of the operational areas in developing a consolidated depot model, which will culminate in the construction of two large-scale depot facilities, one on the northside of the city, and the other on the southside. For this project, Codema produced a project proposal for the potential energy saving figures from the northside depot in Ballymun, and this was presented to senior management.

In 2018, DCC's Corporate Services Department requested Codema to complete an independent review and assessment of two external reports that were carried out in 2015 and 2016 and analysed the potential for the installation of a CHP unit in the basement of the Civic Offices, with a view to progressing the project. Codema reviewed both documents and made recommendations based on our findings. Codema also explored the potential contract and procurement approaches that would help deliver the best possible outcome for DCC. The report was presented to the Corporate Services Department, after which an interdepartmental steering committee was set up to advance the project.



Baseline Emission Reports

In 2018, Codema produced four Baseline Emission Reports on behalf of Dublin City Council, Dún Laoghaire–Rathdown County Council, Fingal County Council and South Dublin County Council. These reports outlined the methodologies and results of the four different local authority area's energy use and emissions in different sectors.

Codema conducted this analysis in order to advance energy and CO₂ emission baseline methodologies in Ireland, so that they may be replicated by other local authorities. These baseline reports aimed to raise awareness of climate change and the impact that different sectors in the counties have on Ireland's overall carbon emissions and energy use. They provided the local authorities with the necessary information to make decisions on climate change actions to lower carbon emissions in the areas they have responsibility for.

This was a county-wide baseline and was used as part of the four Dublin Local Authorities' Climate Change Action Plans, which detail the actions that are planned in order to curtail energy consumption and CO₂ emissions in the DLAs' buildings and operations. This assessment is part of the commitment that the Dublin Local Authorities have made as signatories to the European Union's Covenant of Mayors for Climate and

Energy initiative. This involves the monitoring of city-level energy consumption and CO₂ emissions, and reporting on the progress of energy and emission actions that affect the local authority area.

The baseline year for this analysis was 2016, except for transport, which was based on 2012 data from the National Transport Authority (NTA), and projected up to 2016. The sectors that were included in this analysis are: residential, commercial, transport, social housing, agriculture, municipal, waste, and wastewater.

Codema found that the total emissions from various sectors in the Dublin Region amount to the equivalent of 7,804,595 tonnes of CO₂, which is the equivalent to 5.8 tCO₂eq per capita. The areas that produced the most emissions were the transport, residential and commercial sectors, producing 34%, 31% and 29% respectively, of the total emissions in the Dublin Region. From this analysis, these three sectors should be the main targets of energy and emission reduction initiatives.





Photo courtesy of Dublin City Council

An Energy Performance Contract is a contractual agreement by an Energy Service Company (ESCO) to guarantee energy savings over an agreed period of time.

Energy Performance Contracting (EPC)

EPC in DCC Buildings

In 2018, Codema continued to assist DCC with the ongoing Measurement and Verification (M&V) of its first EPC project involving Ballymun, Finglas and Markievicz Sports and Fitness Centres. The latest M&V figures show that between December 2016 and August 2018, the project has achieved cost savings of €318,281 and energy savings of 38%. Codema will continue to assist DCC with managing this M&V process in 2019.

Due to the success of this pilot project, Codema also helped DCC to significantly advance a second EPC project in 2018. This project will involve an upgrade to the existing lighting, heating and ventilation systems across seven Council buildings. The largest building is Ballyfermot Sports and Fitness Centre; the other six buildings are dry sports halls, namely St Catherine's Community Centre, Ballybough Community Centre, Cabra Parkside, Irishtown Sports and Fitness Centre, Bluebell Sports Centre, and Poppintree Community Sports Centre.

The tender documentation for this project was released in June 2018 and followed the competitive dialogue procurement method of the previous EPC. The procurement process was completed in September 2018 and the successful ESCo was selected. This was followed by an introductory meeting between the ESCo and the centre managers, organised by Codema, in preparation for the design and installation of the works in each of the centres. Work will get underway in 2019 and Codema estimates that total energy savings from the project will be approximately 25-30%.



Photo courtesy of Fingal County Council

EPC in DLRCC Buildings

In October 2018, Codema completed the project identification and initial appraisal phase for a potential EPC project in Dún Laoghaire-Rathdown County Council for its Loughlinstown, Meadowbrook and Monkstown Leisure Centres. This involved a detailed survey of each of the proposed buildings to assess their suitability for EPC, and to assess the potential for energy savings. The project will involve an upgrade to heating and ventilation systems in the three buildings. This will include improvements to pumps and the heating and ventilation system operation. The operation of the existing Combined Heat and Power (CHP) systems in Meadowbrook and Monkstown Leisure Centres will be enhanced and the CHP system in Loughlinstown will be reinstated. The project will achieve average energy savings of 20% - 25%.

Once approval has been granted and funding and project management resources assigned, Codema will then proceed with the preparation of the necessary procurement and contract documentation, with the aim of having a signed contract by the end of 2019. Codema also submitted a Project Assistance Grant (PAG) application to SEAI in early 2018, on behalf of the Council.

EPC in FCC Buildings

In 2018, Codema worked to advance a planned EPC project in FCC. This project involves FCC's headquarters at County Hall in Swords, along with its Civic Offices, the Draíocht Arts Centre, and public library in Blanchardstown. The project plans to upgrade the existing lighting, heating and ventilation systems in the three buildings. Boiler upgrades, control systems and renewable energy systems such as PV panels will also be considered. The project will save the Council over €80,000 on its energy and maintenance costs, and will achieve average energy savings of 20% - 30%. If the project is approved by FCC, Codema will then proceed with the preparation of the necessary procurement and contract documentation to advance this project further in 2019.

EPC in SDCC Buildings

In October 2018, Codema completed the Project Identification and Initial Appraisal document for a potential EPC project in Tallaght and Clondalkin Leisure Centres. The project will involve an upgrade to existing lighting, heating and ventilation systems in the two buildings. Boiler upgrades and a new CHP system for Clondalkin and a major overhaul of the existing CHP system in Tallaght may also be considered. The project will save the Council over €116,000 on its energy and maintenance costs, and will achieve average energy savings of 25% - 30%. Once this project has been approved by SDCC and funding and project management resources assigned, Codema will then proceed with the preparation of the necessary procurement and contract documentation, with the aim of having a signed contract by the end of 2019.

03. WORK PROGRAMME 2018

ENERGY MONITORING AND MANAGEMENT (CONTINUED)

ENERGY MONITORING AND MANAGEMENT - KEY OUTPUTS FOR 2018



**ESCo SELECTED
FOR 1 MORE
LOCAL AUTHORITY
EPC PROJECT**



**77 DECS
GENERATED
FOR THE DLAS**



**2,561 ENERGY
ACCOUNTS ENTERED
INTO M&R SYSTEM**

Energy Monitoring and Management - Actions and Outputs 2018

Date	Actions	Project support	Outputs
January - December	Site visits of 10 DLA facilities	--	Site visits conducted of 10 DLA facilities, 6 in-depth energy audit reports completed for SEUs
February	Gathering MPRN and GPRN data for M&R process	--	2,561 energy accounts entered into M&R system
	Application made to SEAI for PAG funding for DLRCC EPC	--	Application submitted to SEAI
March	Calculated the total GHGs for 2016 for the Dublin Region	SEAI	Baseline Emission Reports completed for the 4 DLAs
	Preparation of EPC II PQQ tender for DCC	SEAI / GuarantEE	Pre-Qualification Questionnaire issued
April	Facilitation of DCC Energy Oversight Committee meeting	--	12 committee members in attendance
	Oversight of 2nd M&V report completed for DCC EPC	--	2nd M&V report produced
	Gathering of other fuels data for M&R process	--	M&R process completed for 2018
May	Application made to SEAI for PAG funding for SDCC EPC	--	Application submitted to SEAI
	Application made to SEAI for PAG funding for SDCC DH peer review	--	Application submitted to SEAI
	Comparison calculations of energy performance of new Ballymun super depot compared to upgrade of individual depots	--	Potential savings calculated and included in project proposal
June	Review of CHP performance in DCC's Civic Offices	DCC special project	CHP Review Report for DCC and recommendations
	Preparation of DCC EPC II Invitation to Competitive Dialogue tender documentation	SEAI / GuarantEE	Tender documentation issued

Date	Actions	Project support	Outputs
July	Development of Energy Reviews for DCC and SDCC	--	Energy Reviews completed for DCC and SDCC
August	Development of Energy Review for FCC	--	Energy Review completed for FCC
	Analysis of building energy management data from the Ballymun Rediscovery Centre	--	Ballymun WISER report completed for Ballymun Rediscovery Centre
	Prepared case study on upgrades implemented at Tallaght Stadium	--	Tallaght Stadium case study completed
	Energy audit of Eblana House	--	Eblana House report completed
	PAG funding approved for SDCC EPC and DH projects	--	Applications approved by SEAI
September	Evaluation of shortlisted ESCOs for the EPC II project	SEAI / GuarantEE	ESCO selected for EPC II
	77 DEC's generated for DCC, FCC and SDCC public buildings	--	Display Energy Certificates issued for 77 public buildings
	Oversight of 3rd M&V report completed for DCC EPC	--	€188,000 and 38% energy savings achieved in second project year
October	Project Identification and Initial Appraisal documents developed for DLRCC EPC	GuarantEE	Documents submitted to DLRCC for approval
	Project Identification and Initial Appraisal documents developed for SDCC EPC	GuarantEE	Documents submitted to SDCC for approval
	Prepared an application for funding for SDCC public lighting	--	Submitted application to CAF
	Facilitated DLRCC's Energy Team meeting	--	DLRCC Energy Team meeting held
November	Organised EPC II workshop	GuarantEE	Workshop attended by all building managers and ESCo
	Energy audit at SDCC County Hall	--	SDCC County Hall report completed and sent to Council for review
	Energy audit at Clondalkin Civic Offices	--	Clondalkin Civic Offices audit complete and report sent to SDCC for review
	Completion of Project Identification and Appraisal Reports for Joinery Workshop, Parkgate Hall and Maple House	--	Report sent to DCC's Energy Oversight Committee
	Procured Powertherm as designer of the boiler replacement in the O'Brien Institute	SEAI	Approval of design for installation at the O'Brien Institute
	Analysis of renewable energy opportunities for Arthurstown landfill site	SDCC (special project)	Arthurstown landfill report completed
	Setting up of Energy Elephant software within DCC	--	Contract signed for use of Energy Elephant software
December	DLRCC EPC - Updated Project Identification and Initial Appraisal document	GuarantEE	Draft document updated for DLRCC
	Analysis of DCC City Farm Project to become energy self sufficient	--	Final report on renewable energy potential submitted to DCC

03. WORK PROGRAMME 2018



ENERGY AND CLIMATE AWARENESS

Home Energy Saving Kits

The Home Energy Saving Kit scheme had another very successful year in 2018, with major expansion to the majority of libraries in Dublin and also to selected libraries across Ireland.

Dún Laoghaire-Rathdown County Council

The Home Energy Saving Kits were introduced to four of Dún Laoghaire-Rathdown County Council's libraries in February 2018, and an additional kit was made available by Codema for Council staff to borrow from the Corporate Services Department. In October, Codema donated additional Home Energy Saving Kits to the remaining four branches in Dún Laoghaire-Rathdown's library network, meaning that all of the Council's libraries now have kits available for the public to borrow. As part of this process, Codema carried out staff training on the kits with representatives from all eight library branches.

Fingal County Council

In February 2018, Codema introduced the Home Energy Saving Kits into four of Fingal County Council's library branches: Balbriggan, Blanchardstown, Swords and Malahide and carried out staff training with representatives from each of these library branches prior to them being made publicly available. In May 2018, Codema carried out training with staff

from the remaining six Fingal library branches and the Home Energy Saving Kits were officially launched into all of Fingal's libraries in June.

South Dublin County Council

In September 2018, Codema carried out training with staff from selected library branches in South Dublin County Council. The kits were then launched into three South Dublin County Libraries the following month - County Library (Tallaght), Ballyroan and Lucan, where they are now available for the public to borrow.

The expansion of the Home Energy Saving Kits across the Dublin Region means that the scheme is now up and running in almost every library branch in the County.

Expansion Nationwide

In January 2018, Codema introduced the Home Energy Saving Kits into all libraries in Roscommon and Leitrim, with support from the Department of Communications, Climate Action and Environment (DCCAE) and the Sustainable Energy Authority of Ireland (SEAI). Codema then introduced the scheme into all library branches in Cork City the following month. The launch of the kits into these areas also involved Codema travelling to these library networks to carry out staff training with representatives from each of the library branches prior to the introduction of the scheme.



In March 2018, Wexford Libraries requested a Home Energy Saving Kit for its Gorey branch, followed by another kit each for Wexford Town and Enniscorthy Libraries in June, taking the total number of kits available in Wexford's library network to three.

At the end of 2018, Codema had received enquiries about the kits from both Galway County Council and the Galway-Mayo Institute of Technology, and both of these organisations are due to introduce the scheme in 2019.

Behavioural Analysis

The spring of 2018 saw the completion of almost one year's work in gathering feedback from the users of the Home Energy Saving Kit through detailed survey forms, which the public could complete and send back, or carry out online through Survey Monkey. This analysis was a collaboration between Codema, SEAI, M.CO and Dublin City Council's Public Libraries, as part of SEAI's involvement in the International Energy Agency's Task 24 project.

Throughout this period, 250 surveys in total were collected from users of the kit such as library patrons, local authority staff and those involved in SEAI's Sustainable Energy Communities. Particular emphasis was placed on examining the potential of the kits to encourage behaviour change in the home in terms of both everyday energy use and investment in home energy upgrades.

In July 2018, a detailed report was finalised outlining and evaluating the user feedback on the Home Energy Saving Kits. The research revealed that the overwhelming majority of participants had a positive experience of the kits. The kits were found to increase awareness of energy use in the home, with 86% of survey respondents stating that it made them 'think about how [they] use energy in the home'.

Over half of participants reported intentions to act following their experience of borrowing the kit; 60% stated that it made them 'think about home upgrades' and 51% stated that it made them 'think about appliance upgrades'. As a longitudinal survey was not carried out, it is not possible to assess whether these intentions were translated into action. However, interviews and focus groups did show anecdotal evidence of some people continuing their behaviour changes and investing in energy upgrades following their engagement with the kit.

Codema will continue to work with SEAI on this in 2019 to build on this research and look at the next steps for developing the kits, while monitoring and expanding the scheme in libraries across Dublin and nationwide.

03. WORK PROGRAMME 2018

ENERGY AND CLIMATE AWARENESS (CONTINUED)

Events

In 2018, Codema organised or participated in the following events relating to the Home Energy Saving Kit:

- **SEAI Energy Awareness Showcase Event**

Codema's Communications Manager presented the Home Energy Saving Kit to numerous public sector organisations and local authorities at SEAI's Energy Awareness Showcase Event in March 2018. The event gave organisations involved in SEAI's energy awareness programme the opportunity to learn about the kits and for Codema to learn how other public sector bodies are incorporating energy awareness activities into their workplaces.

- **Design Thinking Workshop**

Codema attended a Design Thinking Workshop organised by SEAI around the Home Energy Saving Kits. The workshop included contractors, other organisations in the energy sector and staff from SEAI's Behavioural Economics Unit and Sustainable Energy Communities programme. The workshop aimed to explore the research from the user survey results and to discuss how the Home Energy Saving Kit could be further developed in 2019 onwards.

- **Intensify Stakeholder Group Meeting**

In November 2018, Codema became a stakeholder in the Intensify Project, which is funded by the Interreg Europe programme. Codema participated in the first stakeholder group meeting, which was attended by local authority staff and energy sector organisations. The Intensify project seeks to change community and individual behaviour so as to bring about an increase in the intensity of effort by citizens to reduce carbon emissions. Codema's Communications Manager gave a presentation on the Home Energy Saving Kit as a practical way that citizens and communities can take control of their daily energy use.

Think Energy

Think Energy in the DLAs

In December 2018, Codema carried out two energy-saving lunchtime talks in Fingal County Council, one in its Blanchardstown Civic Offices and the other in County Hall in Swords. Both talks were well attended and Codema gave a breakdown on the Council's energy use, its Significant Energy Users and its Draft Climate Change Action Plan. Codema will continue to implement the principles from its Think Energy campaign into all the Dublin Local Authorities in 2019, in order to encourage energy saving and awareness among staff in both the home and the workplace.



Climate Awareness

Climate Change Action Plans

Throughout 2018, Codema's Communications Team worked on preparing and developing the Climate Change Action Plans on behalf of the four Dublin Local Authorities. This included procuring and working with a graphic designer to develop a design template for each plan, which could be modified and edited by the team in-house going forward. The Communications Team also carried out full proofing and editing of each document, along with the development of key infographics for each of the five action areas of the plans.

Codema also engaged a web developer to create an online platform for the plans (www.dublinclimatechange.ie). At the end of 2018, the website was being finalised in preparation of its launch date to coincide with the public consultation process in February 2019. The website gives an overview of the Climate Change Action Plans, the environmental, economic and societal context in which they have been developed, and a full list of actions, which can be filtered by local authority and by action area. Another key aim of the website is to encourage submissions from the public during the public consultation phase.

Climate Change Public Events

In November 2018, Codema's Communications Team began an in-depth event planning strategy for four regional events that would engage the public on the Climate Change Action Plans and encourage submissions during the public consultation process early in 2019. This event planning included the following tasks:

- Preparation of event proposal / event plan
- Regular meetings with the climate action teams and Dublin Climate Action Regional Office (CARO)
- Visiting each venue and liaising with on-site staff
- Developing event floor plans for each of the four events, coordinated by the five action areas
- Liaising with external stakeholders in each action area to participate in the events
- Preparation of a social media strategy
- Liaising with each of the DLAs' communications teams

The four events were set for the following dates for 2019:

- Dublin City Council - 16th February 2019, 12-5pm, Round Room at the Mansion House
- Fingal County Council - 18th February 2019, 5.30-8.30pm, County Hall, Swords
- South Dublin County Council - 19th February 2019, 6-9pm, County Hall, Tallaght
- Dún Laoghaire-Rathdown County Council - 21st February 2019, 3-7pm, National Maritime Museum

As part of the event planning, Codema proposed that these events would follow a similar style (i.e. themed action area display / exhibition areas) and would have a common message running throughout, to reflect the regional / collaborative approach to the plans. The new website www.dublinclimatechange.ie would be heavily promoted and utilised in the run up to and during these events.



03. WORK PROGRAMME 2018

ENERGY AND CLIMATE AWARENESS (CONTINUED)

ENERGY AND CLIMATE AWARENESS - KEY OUTPUTS FOR 2018



HOME ENERGY SAVING KITS AVAILABLE TO BORROW IN 67 PUBLIC LIBRARIES ACROSS IRELAND



5 X PRESENTATIONS ON ENERGY AND CLIMATE AWARENESS



4 X CLIMATE CHANGE PUBLIC EVENTS PLANNED

Energy and Climate Awareness - Actions and Outputs 2018

Date	Actions	Project support	Outputs
January	Staff training on Home Energy Saving Kits for four Dún Laoghaire-Rathdown Libraries	--	Library branch staff in 4 DLR Libraries trained in the Home Energy Saving Kits
	Staff training on Home Energy Saving Kits for Leitrim and Roscommon Libraries	DCCAIE / SEAI	All library branch staff trained in the Home Energy Saving Kits
	Home Energy Saving Kits launched in Leitrim and Roscommon Libraries	DCCAIE / SEAI	Home Energy Saving Kits available for public to borrow from all Leitrim and Roscommon Libraries
February	Staff training on Home Energy Saving Kits for Cork City Libraries	DCCAIE / SEAI	All Cork City library branch staff trained in the Home Energy Saving Kits
	Home Energy Saving Kits launched in Cork City Libraries	DCCAIE / SEAI	Home Energy Saving Kits available for public to borrow from all Cork City Libraries
	Staff training on Home Energy Saving Kits for four Fingal Libraries	--	Library branch staff in 4 Fingal Libraries trained in the Home Energy Saving Kits
	Home Energy Saving Kits launched in four DLR Libraries	--	Home Energy Saving Kits available for public to borrow from four DLR Libraries
	Job spec put out to tender for design of Climate Change Action Plans	--	Designer procured for Climate Change Action Plans
March	Home Energy Saving Kits introduced into four Fingal Libraries	--	Kits available to borrow from four Fingal Libraries
	Staff training on Home Energy Saving Kits for Gorey Library	--	Gorey library branch staff trained in the Home Energy Saving Kits
	SEAI Energy Awareness Showcase Event	--	Home Energy Saving Kits presented to local authorities and public sector bodies

Date	Actions	Project support	Outputs
April	Home Energy Saving Kit introduced into Wexford Libraries	--	Home Energy Saving Kit available for public to borrow from Gorey Library
	Meeting with South Dublin Libraries to discuss Home Energy Saving Kits	--	3 branches selected for introduction of scheme into South Dublin Libraries
	Job spec developed for climate change website	--	Web developer procured for www.dublinclimatechange.ie
May	SEAI Design Thinking Workshop	--	Findings from Home Energy Saving Kit surveys discussed at workshop
	Staff training on Home Energy Saving Kits for remaining six Fingal Libraries	--	Library branch staff in remaining six Fingal Libraries trained in the Home Energy Saving Kits
June	Home Energy Saving Kits introduced into remaining six Fingal Libraries	--	Kits officially launched and available to borrow from all Fingal Libraries
September	Staff training on Home Energy Saving Kits for three South Dublin Libraries	--	Library branch staff in three South Dublin Libraries trained in the Home Energy Saving Kits
October	Staff training on Home Energy Saving Kits for remaining four Dún Laoghaire-Rathdown Libraries	--	Library branch staff in remaining four Dún Laoghaire-Rathdown Libraries trained in the Home Energy Saving Kits
	Official launch of Home Energy Saving Kits in three South Dublin Libraries	--	Kits available to borrow from three South Dublin Libraries
November	Event proposal presented to DLAs for climate change public engagement events in 2019	--	Proposal agreed and event strategy implemented
	Intensify Stakeholder Group meeting	--	Home Energy Saving Kits presented at the first stakeholder meeting
	Meetings with DLAs for climate change events	DLA Special Project	Event plan presented and progressed
	Venue site visits for climate change events	DLA Special Project	Site visits carried out, floor plans prepared
December	(cntd) Meetings with DLAs for climate change events	DLA Special Project	Event plan presented and progressed
	(cntd) Venue site visits for climate change events	DLA Special Project	Site visits carried out, floor plans prepared
	Fingal Lunchtime Energy Awareness Talks	--	Lunchtime talks delivered to staff in County Hall (Swords) and Civic Offices (Blanchardstown)
	Preparation of Home Energy Saving Kits for Galway County Council and Galway-Mayo Institute of Technology	--	6 kits prepared in total for delivery in 2019

03. WORK PROGRAMME 2018



ENERGY PLANNING AND POLICY

Climate Change

Dublin Local Authority Climate Change Action Plans

In 2018, Codema continued the one-to-one interviews with staff members across the 4 DLAs to gather climate actions for their Climate Change Action Plans (CCAPs).

A baseline emissions inventory was finalised to quantify the amount of greenhouse gas (GHG) emissions attributed to each of the DLA activities, as well as total GHGs for the rest of the city and county. In addition to this, Codema established an adaptation baseline and calculated a risk profile for the Dublin Region's current and future climate change impacts. Codema drafted the CCAPs with reference to these two baselines and the collected action database. The plans took the form of background and policy context, baseline chapters and five action areas - Energy and Buildings, Transport, Flooding, Nature-Based Solutions and Resource Management, which reflected the services provided by the DLAs.

Once an early draft was completed, it was sent to Dr Barry O'Dwyer of UCC and the Marine and Renewable Energy Research, Development and Innovation Centre (MaREI) for peer review and compliance with the Department of Communications, Climate Action and Environment's Local Authority Adaptation Strategy Development Guidelines 2018. The document was designed to a high standard by Codema. An advanced draft was sent to the four DLAs and their respective Strategic Policy Committees for review. Following on from this process, Codema had an intensive round of editing and collating of additional material. In November,

Codema procured and appointed a consultant to screen for a Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA); this has led to a full AA and SEA report being commissioned for all four plans. Codema worked with the Dublin Climate Action Regional Office (CARO) to manage this process. The Dublin CARO was established in the latter half of 2018 and has worked closely with Codema on the final development stages of the CCAPs.

The development of the CCAPs required numerous meetings with DLA management, environmental steering groups, Strategic Policy Committees and full Council presentations. Public participation in the development of the plans was important, so as a result, the DLAs appointed Codema to organise four major public awareness events to take place during the public consultation process in February 2019.

A web platform was commissioned by Codema on behalf of the DLAs to display the plans in an interactive and accessible way; this platform would go live in conjunction with the public consultation period to encourage awareness and public submissions.

To finalise the plans in 2019, Codema will:

- Coordinate the planning and running of four large public awareness events, one for each Council
- Complete the final design and edit of the plans
- Print the final plans
- Update the platform with reference to the final plans



Covenant of Mayors for Climate & Energy

Covenant of Mayors for Climate and Energy

All four DLAs are signatories to the Covenant of Mayors for Climate and Energy. This initiative is a voluntary commitment by the signatories to reduce GHG emissions by at least 40% by 2030 and to adopt an integrated approach to tackling climate change mitigation and adaptation.

Accordingly, the four DLAs commit to submitting a Sustainable Energy and Climate Action Plan (SECAP), outlining the key actions they plan to undertake, and this must be submitted within two years of signing up to the initiative.

The current Climate Change Action Plans are forming the basis for the SECAP submissions. The plans will feature a Baseline Emission Inventory to track mitigation actions

and a Climate Risks and Vulnerability Assessment. In 2018, Codema developed Baseline Emissions Reports for the Dublin Region, which outlined the total emissions in Dublin City, Dún Laoghaire-Rathdown, Fingal and South Dublin in areas such as the residential, commercial and transport sectors.

Dublin Region Energy Master Plan

In addition to the Climate Change Action Plans and Baseline Emission Inventories already mentioned in this section, Codema's application to SEAI's Research, Development and Demonstration (RD&D) programme to develop an energy master plan for the entire Dublin Region was approved in August 2018.

The Dublin Region Energy Master Plan will create evidence-based, realistic, and costed pathways for the Dublin Region to achieve its carbon emissions reduction targets to 2030 and 2050. The plan will focus on the energy areas where actions can be taken to introduce energy efficiency measures and reduce CO₂ emissions. Codema will advance the work on this project in 2019.

03. WORK PROGRAMME 2018

ENERGY PLANNING AND POLICY (CONTINUED)



National Consultations

In 2018, Codema made numerous submissions to national level consultations that support the work of the DLAs in the area of energy and climate change. These submissions are listed below:

- EU Strategy on Adaptation to Climate Change
- New Part L Building Regulations
- Initial Public Consultation on the National Energy and Climate Plan
- Eastern and Midland Regional Assembly RSES Consultation Issues Paper

In 2019, Codema will continue to lobby for supports for the DLAs to carry out projects to reduce greenhouse gas emissions, such as district heating, planning policy, energy retrofitting, renewable energy, and climate change action planning.

District Heating

National District Heating Working Group

Codema is an active member of the Department of Communications, Climate Action and Environment's District Heating Working Group, which was officially established in November 2017. The aim of the group is to develop a policy framework to encourage the development of district heating, and Codema attended two meetings in 2018 to advise the Department on the local barriers and opportunities for developing this low-carbon heating infrastructure across Ireland.

Climate Action Fund

Codema was instrumental in securing funding for two local authority district heating projects in the first call of the government's Climate Action Fund, the details of which were announced by An Taoiseach Leo Varadkar, Climate Action Minister Richard Bruton and Finance Minister Paschal Donohoe in November 2018.

Codema's Senior Energy Planner drafted the entire application for the Tallaght District Heating Scheme (South Dublin County Council), which was awarded €4.5 million. Codema also calculated the renewable energy, CO₂ and energy efficiency of the Dublin District Heating System (DDHS) and completed other sections of the application on behalf of Dublin City Council and this project will receive up to €20 million through the fund. These projects were just two of seven projects that were successful in the first call, from a total of 97 applications. For further information on the Dublin District Heating System and the Tallaght District Heating Scheme, please see the individual sections on the next page.



Codema was instrumental in securing funding for two local authority district heating projects in the first call of the government's Climate Action Fund.

Dublin District Heating System

On behalf of the DDHS Project Team, Codema organised a study tour in 2018 for DCC staff to Sweden and Denmark, which included visiting district heating facilities and presentations from leading district heating experts. Codema supported and supplied the energy data and models required to complete the work carried out by Ramboll and the National Development Finance Agency during 2018. As mentioned earlier, Codema helped to secure funding for the DDHS on behalf of Dublin City Council through the Climate Action Fund. On behalf of the Project Team, Codema attended 22 meetings and workshops in 2018, providing advice on district heating planning, policy and financial feasibility.

Tallaght District Heating Scheme

In 2018, Codema delivered some key milestones on the Tallaght District Heating Scheme (TDHS), including an Outline Business Case, Stage 1 of the procurement process (Pre-Qualification Questionnaire), and a successful application for €4.5 million of funding from the Climate Action Fund (mentioned earlier). Codema has been continuously liaising and negotiating with possible TDHS customers, and has secured the connection of the new residential development at Belgard Gardens and the Technical University Dublin Tallaght. Codema secured the services of Philip Lee solicitors through the SEAI to help develop the TDHS contract, and secured SEAI technical assistance funding for advisory services.

03. WORK PROGRAMME 2018

ENERGY PLANNING AND POLICY (CONTINUED)

ENERGY PLANNING AND POLICY - KEY OUTPUTS FOR 2018



4 X CLIMATE CHANGE ACTION PLANS AT FINAL DRAFT STAGE



2 X DISTRICT HEATING PROJECTS AWARDED FUNDING THROUGH CLIMATE ACTION FUND



4 X BASELINE EMISSION INVENTORIES PRODUCED FOR DUBLIN REGION

Energy Planning and Policy - Actions and Outputs 2018

Date	Actions	Project support	Outputs
January - March	One-to-one meetings organised to develop climate change actions	--	DLA staff participated in one-to-one meetings
January - December	Reporting CCAPs' progress to Director of Services / SPCs	--	6 meetings held in total throughout 2018
	TDHS project meetings	HeatNet NWE	9 project team meetings
	Lectures / presentations delivered on energy systems, district heating and energy planning to 9 academic institutions or industry conferences	--	9 lectures / presentations delivered in total
	Participation on DDHS project team	--	Attended 22 DDHS meetings during 2018
January	Addressed the Eastern and Midland Regional Assembly on CCAPs	--	Presentation given in City Hall on CCAPs
	Study trip for SDCC staff to Aberdeen to learn about district heating	HeatNet NWE	Study trip attended by 2 Codema staff and SDCC's Chief Executive and County Architect
February	Submission to Eastern and Midland Regional Assembly Initial Regional Spatial Strategy	--	Submission prepared from Codema and submitted to EMRA
March	Submission to EU's Strategy on Adaptation to Climate Change consultation process	--	Submission prepared from Codema and submitted to the European Commission
	RD&D application for the Dublin Region Energy Master Plan	--	Application submitted to SEAI
	Promotion and sharing of the Dublin Region's Climate Change Action Plans on international stage	--	Represented the 4 DLAs and poster presentation at IPCC Cities and Climate Change Science Conference, Edmonton

Date	Actions	Project support	Outputs
March	Promotion and sharing of the Dublin Region's Climate Change Action Plans on international stage	--	Represented the 4 DLAs at the Urban Future Conference in Vienna
	Baseline Emission Inventories published for 4 DLA areas	SEAI	4 x Baseline Emission Inventories to feed into CCAPs and Covenant of Mayors
	Study trip organised to Denmark and Sweden for DCC on district heating	HeatNet NWE	Study trip organised and attended by 4 DCC staff members
May	Outline Business Case on TDHS prepared for SDCC	HeatNet NWE	Outline Business Case submitted to Chief Executive for review
June	Submission to New Building Regulations Part L	--	Submission prepared by Codema and submitted to DHPLG
August	Development of an Adaptation Baseline for each DLA	--	4 x Adaptation Baselines to feed into CCAPs and Covenant of Mayors
	Dublin Region Energy Master Plan application approved by SEAI	--	Application approved for €180,000
September	PQQ issued for TDHS	HeatNet NWE	All documents prepared by Codema, PQQ published and evaluated, bidders selected for next round
	Proposal prepared for Stage 1 of EU ERA-Net programme	--	Proposal submitted to ERA-Net programme for REDAP project (spatial energy mapping)
	Input into Horizon 2020 application for TOMORROW Project	--	Proposal submitted to Horizon 2020 programme
October	Entire application prepared for CAF support for TDHS	HeatNet NWE	Application submitted to DCCAE for consideration
	Section D of application prepared for CAF support for DDHS	DCC Special Project	Application submitted to DCCAE for consideration
November	CAF funding approval for TDHS and DDHS	--	Initial project approval for DCC and SDCC's DH projects
	Preparation of Stage 2 submission of ERA-Net proposal	--	Stage 2 documents submitted to ERA-Net programme for REDAP project (spatial energy mapping)
	Submission to the initial public consultation on the National Energy and Climate Plan	--	Submission prepared from Codema submitted to DCCAE
	Attended CELSIUS Summit 2018 in Brussels	--	Conference attended by DCC Chief Executive and Codema
	ITPCD issued for TDHS	HeatNet NWE	All documents prepared by Codema, ITPCD published for 2019 evaluation
	Procurement of SEA/AA screening and management of process for CCAPs	DLA Special Project	Appointment of successful contractor
	TOMORROW Project approved by Horizon 2020 programme	--	Funding secured for TOMORROW Project for development of transition roadmaps and stakeholder engagement for all 4 DLAs

03. WORK PROGRAMME 2018



PROJECT MANAGEMENT

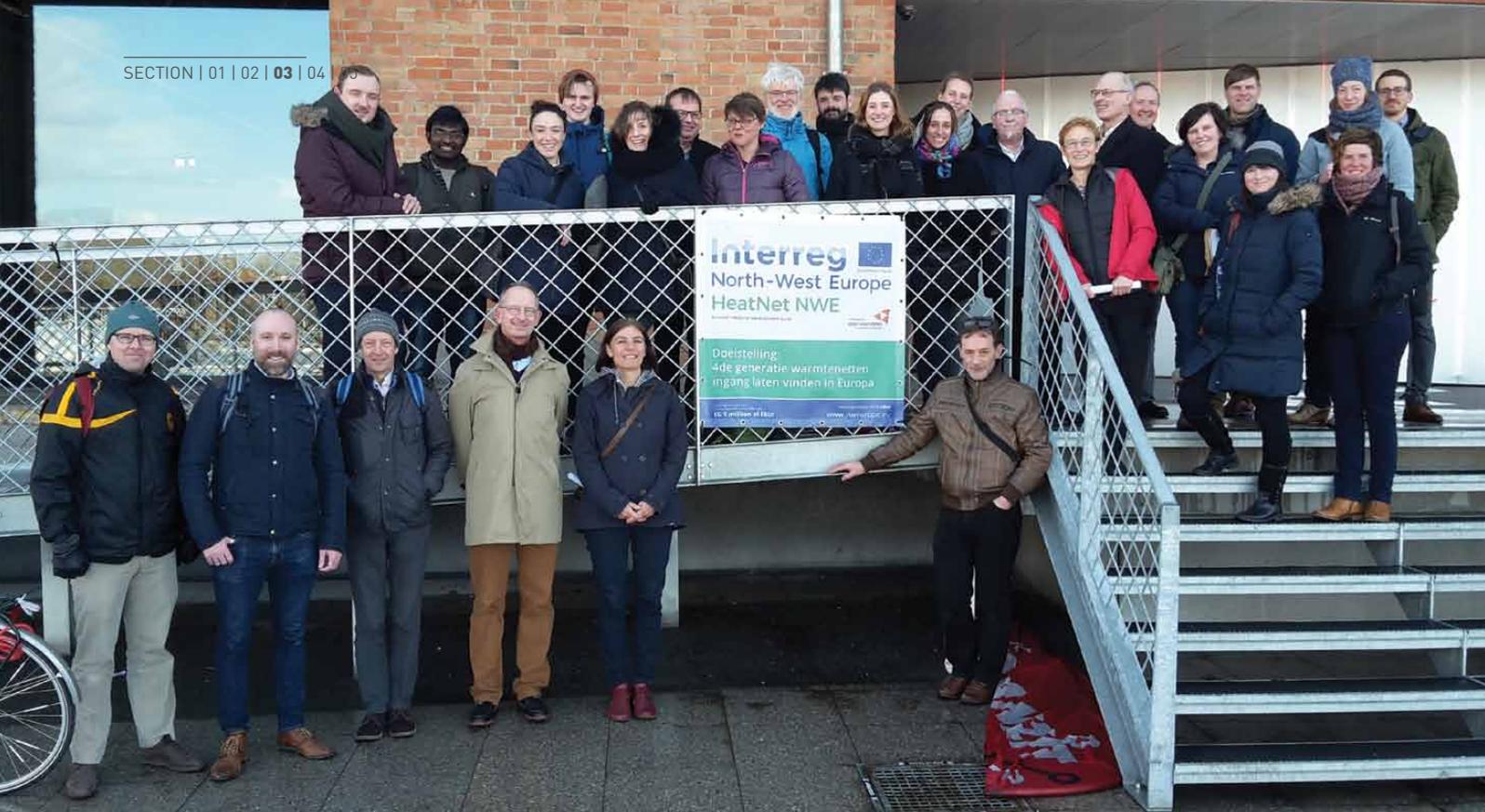
EU Projects

Codema initiates and manages projects that can access EU funding in areas that are beneficial to the Dublin Local Authorities (DLAs). These EU projects help the DLAs to stay up-to-date on the latest energy developments in Europe, test methods and technologies in Ireland that are already widely used in other countries, and gain further knowledge and expertise on improved energy efficiency and renewable energy technologies. Management of these projects involves overseeing the delivery of activities and outputs, communication with EU partners, as well as project administration and financial management.

TOMORROW Project

In 2018, Codema contributed to the application for the TOMORROW project. The project was submitted to the Horizon 2020 project evaluators in September and was approved in December. TOMORROW aims at empowering cities to develop 2050 transition roadmaps in accordance with the Paris Agreement and set up effective governance processes to ensure their successful implementation. This will include many in-depth processes for citizen and stakeholder engagement in each city region. The project will officially begin in September 2019 and will complement our ongoing work on climate mitigation and the Dublin Region Energy Master Plan.

Codema initiates and manages projects that can access EU funding in areas that are beneficial to the Dublin Local Authorities.



HeatNet NWE

Codema is leading the €11.5m HeatNet NWE project to promote the roll-out of 4th Generation District Heating and Cooling (4DHC) across North-West Europe. 4DHC integrates heat, electricity and energy storage to achieve an overall smart energy system, combining high energy efficiency, high shares of renewable energy and waste heat resources.

HeatNet NWE is supported through the Interreg North-West Europe programme and addresses the challenge of reducing CO₂ emissions in the region by creating an integrated, transnational approach to the supply of renewable and low carbon heat (including waste heat) to residential and commercial buildings, developed and tested in local district heating and cooling networks in Ireland, the UK, Belgium, France, and the Netherlands.

The project consists of 13 partners (including Codema as lead partner and SDCC) across these five countries and aims to achieve savings of 15,000 tonnes of CO₂ each year by the end of the project.

As part of HeatNet NWE, Codema carried out the following tasks for the project in 2018:

- Lead partner - day-to-day project management and supervision of communications within the project
- Financial management - successfully submitted the second and third financial claims and received requested grant funding
- Continued to lead the Long-Term work package, which involves the creation of business cases, transition roadmaps and promotion of 4DHC
- Continued input into the Evaluation work package
- Ongoing input into developing the HeatNet NWE Model, which will help municipalities to begin implementing 4DHC projects
- Supported SDCC in developing Dublin's first large-scale public district heating network, with waste heat coming from a large local data centre

Codema also ran two HeatNet NWE partner meetings in 2018 to discuss progress on the project, visit pilot sites, and discuss any outstanding issues or work packages. The first meeting took place in Kortrijk in Belgium and the second meeting was held in Aberdeen in Scotland.

03. WORK PROGRAMME 2018

PROJECT MANAGEMENT (CONTINUED)

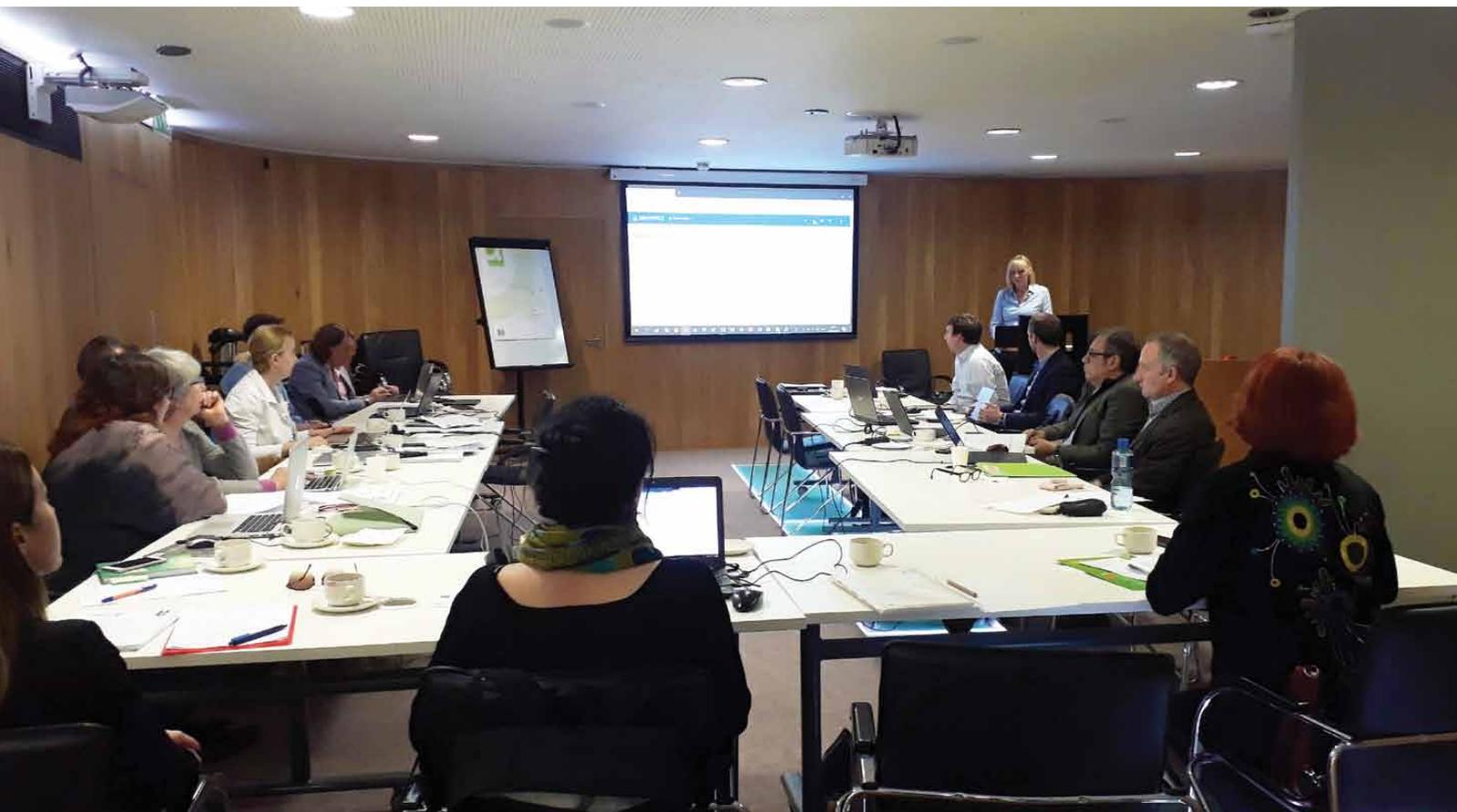
GuarantEE

Codema is a project partner in the Horizon 2020 project GuarantEE, which began in April 2016 and runs until March 2019. The GuarantEE project fosters the use of Energy Performance Contracting (EPC) in the public and private sector across Europe. It is funded by the European Union's Horizon 2020 research and innovation programme and involves 13 partners from across Europe. This project helped Codema to further our knowledge of EPC in 2018 by learning from other European countries such as Austria, the Czech Republic and Germany, where this new form of building energy management is widely used, due to the guarantee of energy savings. Through our involvement in the GuarantEE project, Codema is continuing to develop and promote the role of the EPC facilitator in Ireland and the use of performance-based contracts.

In 2018, Codema facilitated DCC in procuring an ESCo for its second EPC project involving seven of its sports facilities. GuarantEE also supported Codema in exploring additional EPC projects in DLRCC, FCC and SDCC in 2018. In addition, Codema began the analysis of 35 EPC projects that were completed by the project partners during GuarantEE. The projects were analysed for technical, procurement and contractual data with the aim of identifying policy recommendations to help further the EPC market in Europe.

REDAP - ERA-Net Smart Energy Systems Call

In 2018, Codema submitted Stage 1 and 2 applications for the REDAP (Redap Energy Demand Analysis Portal) project, under the ERA-Net Smart Energy Systems Call. REDAP will build upon the work already carried out by Codema on the Spatial Energy Demand Analyses (SEDAs) to help the DLAs integrate energy planning into their practices. The project will build a live online energy and emissions map for the Dublin Region, using GIS, energy modelling and computer programming expertise from partners in Ireland, Sweden and Austria. Codema will use the output portal developed through REDAP to update the SEDAs and to provide greater insight into the energy use of the Dublin Region. The outputs from this project will also be used to update the baseline energy data for both the DLAs' Climate Change Action Plans and the Covenant of Mayor's Sustainable Energy and Climate Action Plans. The project application is at an advanced stage, with official approval expected in the first half of 2019.



EUCAN

Codema was involved in an application together with the Ballymun Axis Centre and cultural partners in Scotland, Sweden and Belgium under the Creative Europe programme. The project is called EUCAN - Cultural Adaptations and supports cross-cutting innovative concepts for promoting communication of climate adaptation through the arts. The project was approved in July and Codema attended the kick-off meeting in London in November.

New EU Funding Streams

Codema regularly scopes all EU funding streams in order to assess their suitability to support local projects for the DLAs. Once a suitable project is identified, Codema can then assist the DLAs in the preparation of project applications, and will submit the applications to the programme's administrators on their behalf.

Local Project Management

EPC Facilitation

In 2018, Codema supported DCC in procuring an ESCo for its second EPC project, which will involve an upgrade to the existing lighting, heating and ventilation systems across seven Council sports facilities. The largest building is Ballyfermot Sports and Fitness Centre; the other six buildings are dry sports halls, namely St Catherine's Community Centre, Ballybough Community Centre, Cabra Parkside, Irishtown Sports and Fitness Centre, Bluebell Sports Centre, and Poppintree Community Sports Centre.

The tender documentation for this project was released in June 2018 and followed the previous competitive dialogue procurement method of the first EPC project. The tenderers were shortlisted and an ESCo selected in September 2018 and the project will move to contract approval and signing stage in 2019, with the work to be completed in the summer.

This second EPC project is expected to achieve average energy savings of between 25-30% per year as a result of the upgrades. Codema and the contractor will verify these energy savings at regular intervals for the duration of the contract. The ESCo is also obliged to maintain and, if necessary, repair, the equipment associated with these upgrades, which can lead to significant savings in maintenance costs for the local authority.

Photo courtesy of McGarry NiÉanaigh Architects and Richard Hatch Photography



03. WORK PROGRAMME 2018

PROJECT MANAGEMENT (CONTINUED)

Energy Research, Development & Demonstration (RD&D) Projects

Dublin Region Energy Master Plan

In March 2018, Codema applied for funding to SEAI's RD&D programme for the development of an Energy Master Plan for the Dublin Region. The application was drafted and submitted to SEAI and we received confirmation of our successful bid in August. The initial stages of the project got underway in late 2018 and will continue until April 2021. The Dublin Region Energy Master Plan will create evidence-based, realistic and costed pathways for the Dublin Region to achieve its carbon emissions reduction targets to 2030 and beyond, up to 2050. The plan will focus on the energy areas where actions can be taken to introduce energy efficiency measures and reduce CO₂ emissions.

Home Energy Saving Kits

Codema received funding from the Department of Communications, Climate Action and Environment and SEAI to roll out the Home Energy Saving Kits to selected counties outside of Dublin. Codema project-managed the development of these kits for Roscommon, Leitrim and Cork City Libraries, which involved dealing with suppliers, procuring the tools for the kits, and updating all promotional material that accompanies the Home Energy Saving Kits. In January and February 2018, these kits were launched in these three library networks, and this process included training for all branch staff.



Codema was also tasked with the planning and organisation of four major public awareness events for the submissions period in 2019.

Climate Change Action Plans

In 2018, Codema continued the management for the drafting of the DLA Climate Change Action Plans (CCAPs). Codema's climate team wrote several iterations of the plans in consultation with DLA staff; this resulted in a refined, advanced draft that was sent for peer review. Codema also began to work with the Dublin Climate Action Regional Office (CARO) and managed the procurement of a consultant to carry out SEA/AA screening and report writing for the plans. Several presentations to Council SPCs, steering committees and full Councils were undertaken. Codema was also tasked with the planning and organisation of four major public awareness events for the submissions period in 2019. Editing, design and proofing resulted in a draft plan being delivered to the DLAs in December.

National and European Projects



District Heating



Stakeholder Engagement



Energy Master Planning



Project Applications



Energy Performance Contracting



Climate Change

European Network

26 EUROPEAN PARTNERS
ACROSS 15 EUROPEAN
COUNTRIES



Learning from experienced EU partners



Showcasing Dublin's achievements to international audience



03. WORK PROGRAMME 2018

PROJECT MANAGEMENT (CONTINUED)

PROJECT MANAGEMENT - KEY OUTPUTS FOR 2018



**1 X SEAI RD&D
PROGRAMME APPROVED**



**2 X HEATNET NWE
PARTNER MEETINGS HELD**



**1 X EU PROJECT
APPROVED**

Project Management - Actions and Outputs 2018

Date	Actions	Project Support	Outputs
January - December	Reporting CCAPs' progress to Directors of Services / SPCs	--	6 meetings held in total throughout 2018
January	Home Energy Saving Kits launched into Roscommon and Leitrim libraries	DCCAIE / SEAI	Home Energy Saving Kits available for public to borrow from all libraries in Roscommon and Leitrim
	Facilitated Ballymun Axis Centre's application under the Creative Europe programme as an adaptation partner for the EUCAN project	--	Application submitted
	Application made to SEAI for PAG funding for DLRCC EPC	--	Application submitted to SEAI
February	Home Energy Saving Kits launched into Cork City libraries	DCCAIE / SEAI	Home Energy Saving Kits available for public to borrow from all libraries in Cork City
March	RD&D application for the Dublin Region Energy Master Plan	--	Application submitted to SEAI
	Preparation of EPC II Pre Qualification Questionnaire for Ballyfermot Sports and Fitness Centre plus 6 dry sports centres	GuarantEE / SEAI	Pre Qualification Questionnaire issued
	Met with representative of Danish Board of District Heating to get advice for the DDHS and TDHS	HeatNet NWE	Future cooperation agreed
	HeatNet NWE partner meeting in Kortrijk	HeatNet NWE	26 participants at partner meeting
	Baseline Emission Inventories published for 4 DLA areas	SEAI	4 x Baseline Emission Inventories developed and submitted to SEAI
April	EU partners meeting for GuarantEE project held in Dublin	GuarantEE	Codema hosted EU partners meeting for GuarantEE project

Date	Actions	Project Support	Outputs
May	Preparation of EPC II competitive dialogue documentation for Ballyfermot Sports and Fitness Centre plus 6 dry sports centres	GuarantEE / SEAI	Competitive dialogue document issued
	Application made to SEAI for PAG funding for SDCC EPC	--	Application submitted to SEAI
	Application made to SEAI for PAG funding for SDCC DH project	--	Application submitted to SEAI
June	2nd progress report and financial claim submitted	HeatNet NWE	Report approved and grant drawn down
July	Preparation of EPC II tender documentation for Ballyfermot Sports and Fitness Centre plus 6 dry sports centres	GuarantEE / SEAI	Invitation to Tender issued
	Ballymun Axis Centre's application for EUCAN project approved	--	Application approved
	Application Lot 6 (Bioenergy and Heat) and Lot 8 (Provision of Training and Support to Public and Professional Bodies) for SEAI framework	--	Application approved, Codema appointed to Lot 6 and Lot 8 framework
August	Dublin Region Energy Master Plan application approved by SEAI	--	Application approved for €180,000
	PAG funding approved for SDCC EPC and DH projects	--	Applications approved by SEAI
September	HeatNet NWE partner meeting in Aberdeen	HeatNet NWE	22 participants at partner meeting
	3rd progress report and financial claim submitted	HeatNet NWE	Report approved and grant drawn down
	Application made under H2020 LC-SC3-EE-16 for TOMORROW Project	--	Application submitted to Horizon 2020 programme
	Evaluation of shortlisted ESCos for the EPC II project	SEAI / GuarantEE	ESCo selected for EPC II
October	Application for Stage 1 ERA-Net proposal	--	Successful in Stage 1
	Project identification and initial appraisal form completed on potential for EPC in DLRCC leisure centres	--	Documents submitted for approval
	Project identification and initial appraisal form completed on potential for EPC in SDCC leisure centres	--	Documents submitted for approval
November	Participated in the EU project EUCAN's kick-off meeting	--	Attended EUCAN Cultural Europe partners meeting in London
	Preparation of Stage 2 submission of ERA-Net proposal	--	Stage 2 submission of ERA-Net proposal submitted
	EU partners meeting for GuarantEE project held in Barcelona	GuarantEE	EU partners meeting for GuarantEE project
December	DLRCC EPC - Updated project identification and initial appraisal document	GuarantEE	Draft document updated for DLRCC
	TOMORROW Project approved by Horizon 2020 programme	--	Funding secured for TOMORROW Project for development of transition roadmaps and stakeholder engagement for all 4 DLAs

03. WORK PROGRAMME 2018



MATCH FUNDING

European Funding

In 2018, Codema was project partner on two European projects; HeatNet NWE, which supports the roll-out of 4th-generation district heating and cooling and is funded under the Interreg North-West Europe programme, and GuarantEE, which is supported through the Horizon 2020 programme and aims to advance Energy Performance Contracting across Europe.

A total net grant of €250,743 was drawn down in 2018 from HeatNet NWE, enabling Codema to provide better services and expertise to the Dublin Local Authorities to advance district heating in their areas.

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Funding Programme	Project	Aim	Project Timeline	Net Grant Drawdown 2018 (€)
<p>INTERREG NWE Programme</p> 		<p>To promote the roll-out of 4th Generation District Heating and Cooling (4DHC) across North-West Europe</p> <p>www.nweurope.eu/heatnet</p>	<p>Sept 2016 - July 2020</p>	<p>€250,743 (60% funded)</p>
<p>Horizon 2020</p>		<p>To foster the use of Energy Performance Contracting in the public and private sector across Europe</p> <p>www.guarantee-project.eu</p>	<p>April 2016 - March 2019</p>	<p>€25,792</p>
Total EU Funding				<p>€276,535</p>

03. WORK PROGRAMME 2018

MATCH FUNDING (CONTINUED)

National Funding

In 2018, Codema received a total of €62,697 in national funding from SEAI. This consisted of advance funding for a RD&D project to create a Dublin Region Energy Master Plan, which will provide detailed, realistic, and costed pathways for Dublin to achieve its carbon emission reduction targets.

In 2018, Codema received a total of €62,697 in national funding from SEAI.

Organisation	Project	Aim	Funding 2018(€)
SEAI RD&D Programme 2018 	Dublin Region Energy Master Plan	The Dublin Region Energy Master Plan will provide detailed, realistic, and costed pathways for Dublin to achieve its carbon emission reduction targets.	€62,697 (pre-payment)
Total National Funding			€62,697

04. FINANCIAL REPORT

Profit and Loss Account 2018

Codema	2018
PROFIT AND LOSS ACCOUNT	€
For the year ended 31 December 2018	
Turnover	
Republic of Ireland	783,262
Europe	823,867
	1,607,129
Cost of sales	-552,982
Gross profit	1,054,147
Administrative expenses	-1,018,263
Operating profit	35,884
Interest payable and similar charges	-523
Profit on ordinary activities before taxation	35,361
Tax on profit on ordinary activities	-5,025
Profit for the year	30,336

04. FINANCIAL REPORT

(CONTINUED)

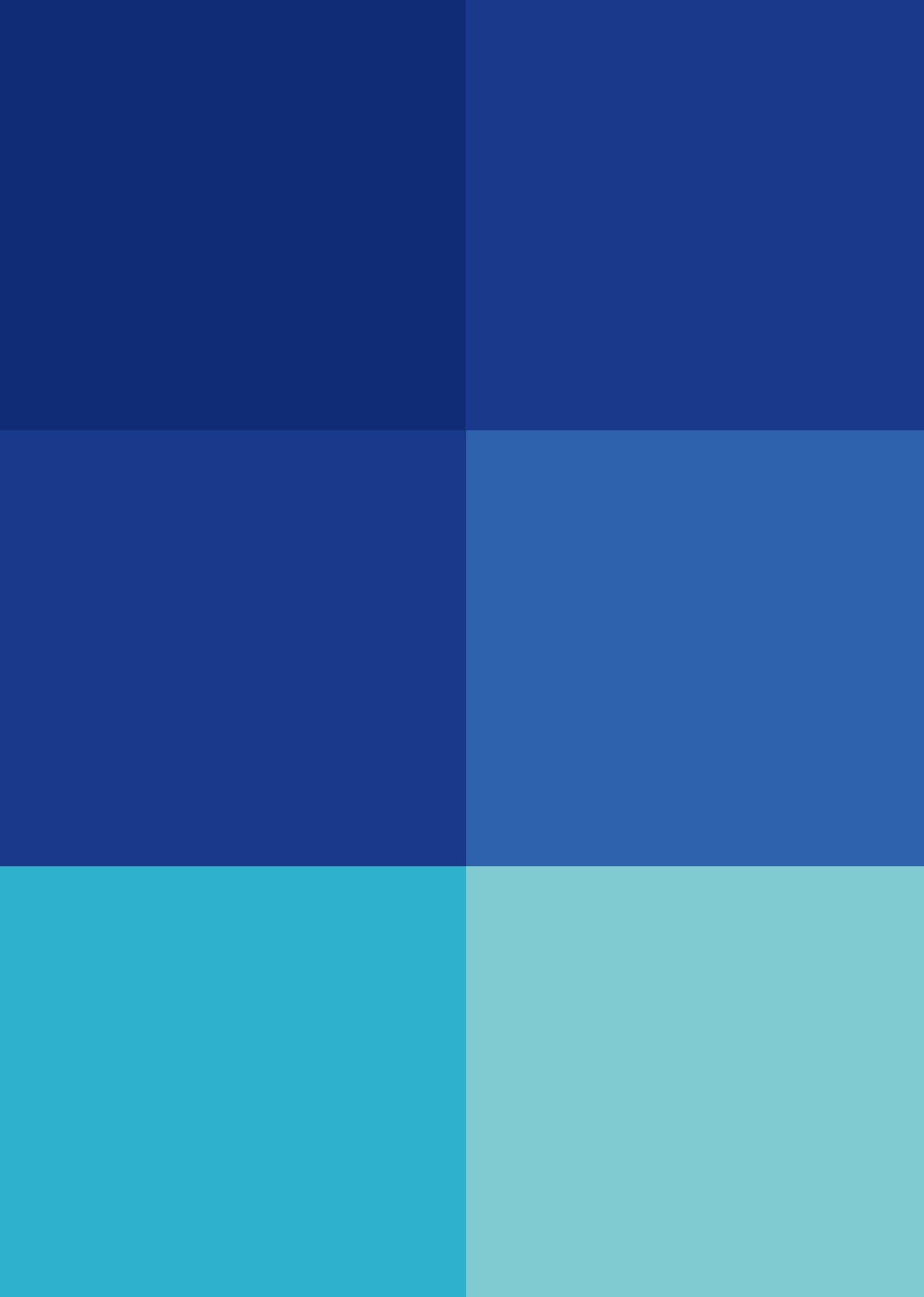
Balance Sheet 2018

Codema BALANCE SHEET For the year ended 31 December 2018	2018 €
Current Assets	
Debtors	48,387
Cash and cash equivalents	358,058
	406,445
Creditors: Amount falling due within one year	-181,492
Net Current Assets	224,953
Total Assets less Current Liabilities	224,953
Capital and Reserves	
Called up share capital	127
Profit and Loss account	224,953
Equity attributable to owners of the company	224,953

05. APPENDICES

Abbreviations

4DHC	4th Generation District Heating and Cooling	H2020	Horizon 2020
AA	Appropriate Assessment	IPCC	Intergovernmental Panel on Climate Change
CAF	Climate Action Fund	IPMVP	International Performance Measurement and Verification Protocol
CARO	Climate Action Regional Office	ITPCD	Invitation to Participate in Competitive Dialogue
CCAP	Climate Change Action Plan	LED	Light-emitting diode
CHP	Combined Heat and Power	M&R	Monitoring and Reporting
CMVP	Certified Measurement and Verification Professional	M&V	Measurement and Verification
CO ₂	Carbon dioxide	MaREI	Marine and Renewable Energy Research, Development and Innovation Centre
DCC	Dublin City Council	MPRN	Meter Point Reference Number (Electricity)
DCCAIE	Department of Communications, Climate Action and Environment	NEEAP	National Energy Efficiency Action Plan
DDHS	Dublin District Heating System	NTA	National Transport Authority
DEC	Display Energy Certificate	NWE	North-West Europe
DFB	Dublin Fire Brigade	PAG	Project Assistance Grant
DH	District Heating	PMP	Project Management Professional
DHPLG	Department of Housing, Planning and Local Government	PQQ	Pre-Qualification Questionnaire
DLAs	Dublin Local Authorities	PV	Photovoltaic
DLR	Dún Laoghaire-Rathdown	RD&D	Research, Development and Demonstration
DLRCC	Dún Laoghaire-Rathdown County Council	REDAP	Redap Energy Demand Analysis Portal
EMRA	Eastern and Midland Regional Assembly	RSES	Regional Spatial and Economic Strategy
EPC	Energy Performance Contracting	SDCC	South Dublin County Council
EPO	Energy Performance Officer	SEA	Strategic Environmental Assessment
ERA-Net	European Research Area Network	SEAI	Sustainable Energy Authority of Ireland
ESCo	Energy Service Company	SECAP	Sustainable Energy and Climate Action Plan
EU	European Union	SEDA	Spatial Energy Demand Analysis
FCC	Fingal County Council	SEU	Significant Energy User
GHG	Greenhouse Gas	SPC	Strategic Policy Committee
GIS	Geographic Information System	TDHS	Tallaght District Heating Scheme
GPRN	Gas Point Reference Number		







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Council

