



A DRAFT STRATEGY TOWARDS CLIMATE CHANGE ACTION PLANS FOR THE DUBLIN LOCAL AUTHORITIES



THE POTENTIAL EFFECTS OF CLIMATE CHANGE PRESENT A GREAT CHALLENGE TO THE CITIZENS OF DUBLIN. HOWEVER, IF TACKLED IN THE RIGHT WAY, THEY ALSO PRESENT ONE OF THE GREATEST OPPORTUNITIES FOR ECONOMIC, SOCIAL AND ENVIRONMENTAL PROGRESS.

DUBLIN, LIKE MOST OF THE WORLD, HAS A FOSSIL FUEL ECONOMY. ITS CITIZENS LIVE AND WORK IN BUILDINGS RUN ON FOSSIL FUELS, THEY TRAVEL IN VEHICLES POWERED BY FOSSIL FUELS AND THEY CONSUME GOODS MADE USING FOSSIL FUELS. THE GREENHOUSE GASES ASSOCIATED WITH THESE ARE INCREASING GLOBAL TEMPERATURES, RAISING SEA LEVELS AND CHANGING WEATHER PATTERNS.

BY MOVING FROM A FOSSIL FUEL BASED SOCIETY TO ONE THAT IS POWERED BY CLEAN, RENEWABLE AND SUSTAINABLE RESOURCES, DUBLIN WILL NOT ONLY MEET INTERNATIONAL OBLIGATIONS, BUT WILL ALSO HELP BUILD A MORE SECURE AND JUST ECONOMY THAT IS INCLUSIVE FOR ALL CITIZENS, WHILST ALSO PROTECTING OUR NATURAL AND BUILT HERITAGE.

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FOREWORD

The Dublin region is central to Ireland's economic recovery and development. Recent data from the Central Statistics Office shows that Dublin's population has grown and will continue to rise towards 2030¹. With a growing population comes an increased responsibility to tackle the effects of climate change that are largely caused by human activity.

We, the four Dublin local authorities (DLAs) – Dublin City Council, Dún Laoghaire-Rathdown County Council, Fingal County Council and South Dublin County Council - recognise that this is not an easy challenge.

Similarly, we acknowledge that under the national Climate Action and Low Carbon Development Act 2015 and international COP21 agreement, we have a responsibility in helping to address the national climate change targets.

Therefore, for the first time, the four DLAs will work together to meet these obligations and tackle climate change head-on.

This strategy document is the first step towards developing collaborative, transboundary Dublin climate change action plans that will help to prevent (mitigate) the harmful activities that are releasing greenhouse gases into the atmosphere, and limit (adapt to) the impact of the effects that are inevitable.

Using a structured approach that focuses on seven key areas (Citizen Engagement, Planning, Energy, Transport, Water, Waste, and Ecosystems & Biodiversity), this strategy sets out how we will develop the individual action plans that are unique to each local authority area but are synchronised in their methodology.

Collaboration is our biggest asset in the fight against climate change and by working together now, we will help ensure a more sustainable, equitable and safe environment for the citizens of Dublin in the future.

INTRODUCTION

Climate change is a transboundary challenge; it does not stop at political and geographical borders, and therefore requires solutions that are not limited by such borders. It is also an immediate challenge, and we need to act now if we are to limit global temperature rise to 2°C. We, the four Dublin Local Authorities, Dublin City Council, Dún Laoghaire-Rathdown, Fingal and South Dublin County Councils, recognise this and the role of the DLAs in positive governance and, in the following document, have stated a common ambition towards tackling climate change in Dublin.

By agreeing to collaborate closely on solutions and synchronising our methodologies for measuring and reporting on our actions, we have taken a Dublin regional approach for both adapting to and mitigating against this important challenge.

Our efforts will concentrate on the actions that we can deliver under our remit as local authorities, and therefore our solutions will focus on those which we can directly control and resource. However, we will also endeavour, where possible, to influence and facilitate other actors throughout Dublin who can help achieve our ambition and fully include all stakeholders, especially Dublin's citizens, in developing the local authority mitigation and adaptation action plans.

“BY SYNCHRONISING OUR METHODOLOGIES, WE WILL BE ABLE TO COMPLETE DUBLIN REGIONAL ENERGY AND CO₂ BASELINES AND MAPS FOR ENERGY USE AND ASSOCIATED CO₂ EMISSIONS.”

This document has seven main focus areas that we will concentrate our efforts on to deliver actions that are under our remit and can contribute towards our vision. These are:

Citizen Engagement



Planning



Energy



Transport



Water



Waste



Ecosystems & Biodiversity



This document is a draft strategy and will include a non-statutory public consultation process in order to engage with the citizens of Dublin. It does not provide specific targets and actions, as these will be decided during the action plan development phase and will be influenced by the National Adaptation Framework and the National Mitigation Plan. This document sets out a vision for a climate-resilient Dublin, and how we will work together to help achieve this vision. By synchronising our methodologies, we will be able to complete Dublin regional energy and CO₂ baselines and maps for energy use and associated CO₂ emissions. From this base, we will start a collaborative process between the DLAs and relevant stakeholders in early 2017 to identify a number of actions under each focus area, along with indicators and targets. These will be developed into four separate action plans, one for each local authority.

These plans will be mutually supportive of each other, and will also take into account the activities and action plans of neighbouring local authorities. The mitigation and adaptation actions within these plans will be costed, planned and scheduled with review dates, indicators and targets. By developing and implementing these plans, we will not only help to fulfil our present statutory obligations, but we will help achieve an equitable and climate-resilient Dublin that will benefit all its citizens.



THE VISION

**"TO HELP TRANSFORM
DUBLIN INTO A CO₂-
NEUTRAL AND CLIMATE-
RESILIENT REGION."**

We, the Dublin local authorities, recognise that climate change is happening and that it poses a challenge to the continuing prosperity and well-being of Dublin's citizens. We also recognise that local authorities can be leaders in the fight against climate change, and that we share a responsibility to work together with national and international partners to tackle this issue.

Through a coordinated, measured and ambitious approach that includes all stakeholders, we will help mitigate the harmful activities that cause climate change. We will also adapt our grey and green infrastructure so that it is resilient to the negative effects of climate change that are unavoidable, and move to sustainable and secure energy sources. These actions will help to protect our cultural and natural heritage and help transform Dublin into a region that is socially and economically stable, attractive to live and work in, and physically resilient to environmental change.



THE MISSION

**"WE WILL LEAD THE
DUBLIN REGIONAL
RESPONSE TO MITIGATE
AND ADAPT TO THE
EFFECTS OF CLIMATE
CHANGE."**

We will work together with relevant stakeholders from the public and private sectors to share knowledge and expertise, in order to create an action plan for each of the four local authority areas. These action plans will aim to significantly reduce carbon emissions in the DLAs by 2030 and adapt to the effects of climate change that cannot be avoided. We will make use of best international practice to make sure we are successful. We will initiate and carry out actions which are under our direct control and, where possible, facilitate those actions which are not. Using an open, transparent and inclusive process, we will learn from all impacts and findings that result from these actions, and will adapt the plans to new political, economic, social and environmental situations. We will encourage other local authorities and national bodies to create their own plans towards the targets for Ireland set out by the EU 2030 Climate & Energy Framework. We will also give advice to the citizens of Dublin on climate change, e.g. how to protect their households from certain elements of climate change.

OUR OBLIGATIONS

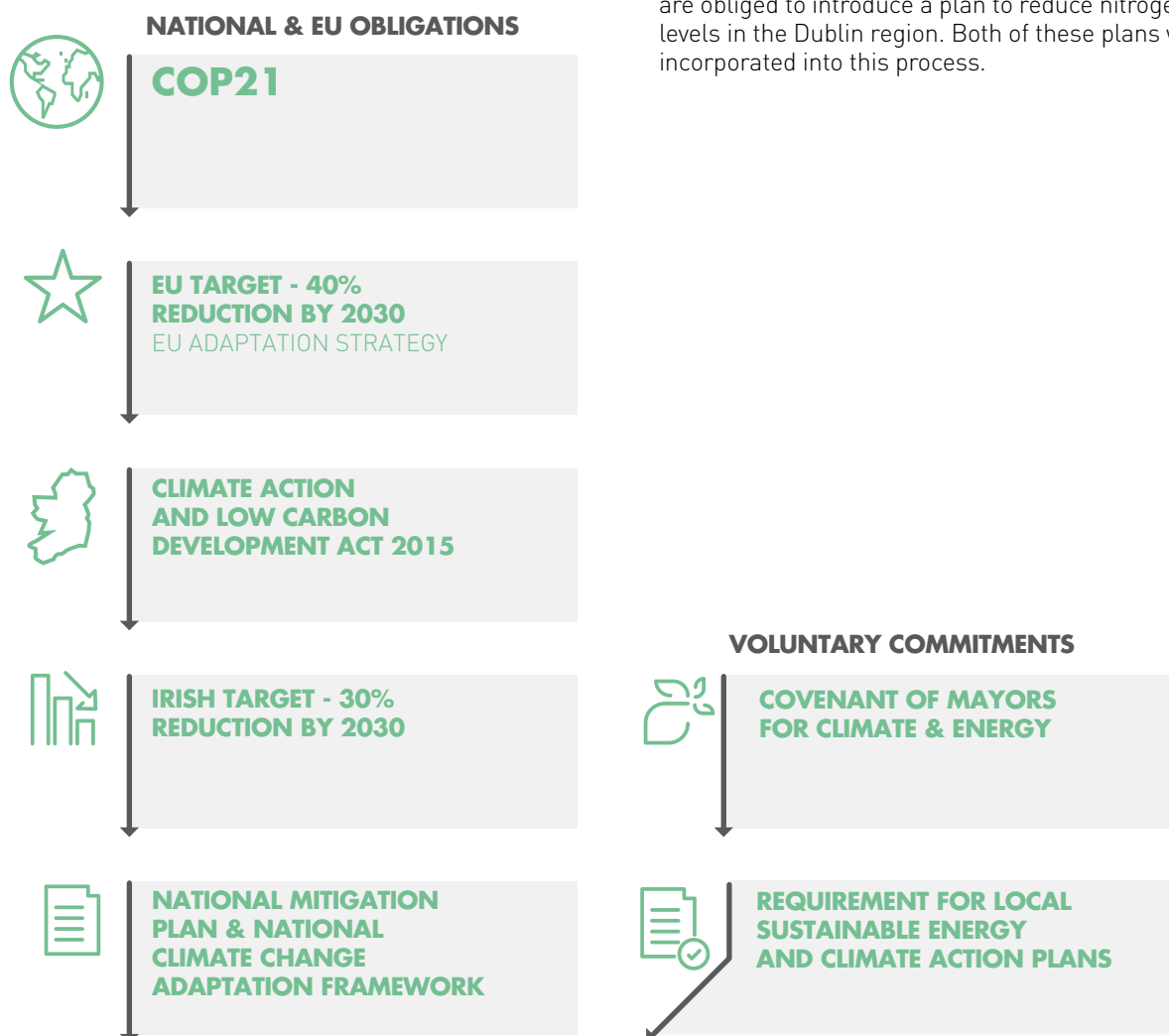
Ireland has a national legally binding target to reduce its greenhouse gas emissions by 30% by the year 2030, relative to its 2005 emissions, under the EU 2030 emissions targets published by the European Commission in July 2016. Ireland has also received some margins for flexibility: 4% flexibility through emissions trading and a 5.6% flexibility from land use (in agriculture), which means a reduction of at least 20.4%. For Dublin, this target effectively translates into challenging reductions in fossil fuel use for transport (petrol/diesel) and for heating buildings (gas/oil).

EU requirements and the commitment given by the EU Member States at the UN 21st annual Conference of Parties (COP21) to reduce GHG emissions by 40% by 2030 have underpinned the enactment of the Climate Action and Low Carbon Development Act 2015 in Ireland. This Act has two main aims: the creation of a national mitigation plan to reduce or prevent greenhouse emissions, and the development of a national adaptation framework to reduce the negative effects of climate change.

The National Adaptation Framework and National Mitigation Plan put a statutory obligation on local authorities to create their own local adaptation framework and mitigation plan for their own area. The DLA climate change mitigation and adaptation action plans that we intend to produce will therefore comply with these obligations.

Another influence on the Dublin Climate Change Mitigation and Adaptation Action Plans is the Covenant of Mayors for Climate and Energy. Dublin City Council, Fingal County Council and South Dublin County Council are already signatories, and Dún Laoghaire-Rathdown County Council is in the process of joining. The Covenant of Mayors is a voluntary initiative whereby its signatories commit to reducing the CO₂ emissions in their territories by 40% by 2030. As part of the requirements of this initiative, signatories undertake to submit their own Sustainable Energy and Climate Action Plans, which the forthcoming Dublin Climate Change Mitigation and Adaptation Action Plans will inform.

**FIGURE 1:
STRATEGY TOWARDS CLIMATE
CHANGE ACTION PLANS
BACKGROUND AND INFLUENCES**



Finally, we also recognise that air quality and climate change are closely linked, and that poor air quality can have a significant impact on public health. Therefore, it is important to include measures for not only reducing carbon, but other air pollutants as well in the local authority mitigation and adaptation action plans. The DLAs currently have a Regional Air Quality Management Plan and are obliged to introduce a plan to reduce nitrogen dioxide levels in the Dublin region. Both of these plans will be incorporated into this process.

4 DUBLIN LOCAL AUTHORITY MITIGATION AND ADAPTATION ACTION PLANS

ACHIEVING THE VISION

Climate Action Groups

In response to the climate change challenge, we, the four Dublin local authorities – Dublin City Council, Dún Laoghaire-Rathdown County Council, Fingal County Council and South Dublin County Council – have developed this strategy for the preparation of the four local authority mitigation and adaptation action plans. These plans will be developed through our relevant Strategic Policy Committees (SPCs) and in association with Codema, Dublin's Energy Agency. This partnership is illustrated in Figure 2.

Each DLA has established an expert group which aims to develop individual but coordinated action plans to address the interconnected challenges of climate mitigation, climate adaptation and carbon-free sustainable energy. Each group consists of representatives from across the DLA departments that are crucial to tackling climate change. Codema will project manage the development of the four action plans, provide technical support in relation to energy issues, and will develop a baseline emissions inventory.

Partnerships

The DLAs will work together and with relevant stakeholders to create inclusive and interconnected local authority mitigation and adaptation action plans. We will work with the local and regional networks that are already in place, as well as with NGOs, green business partners, citizen action groups and the local authorities that border our county.

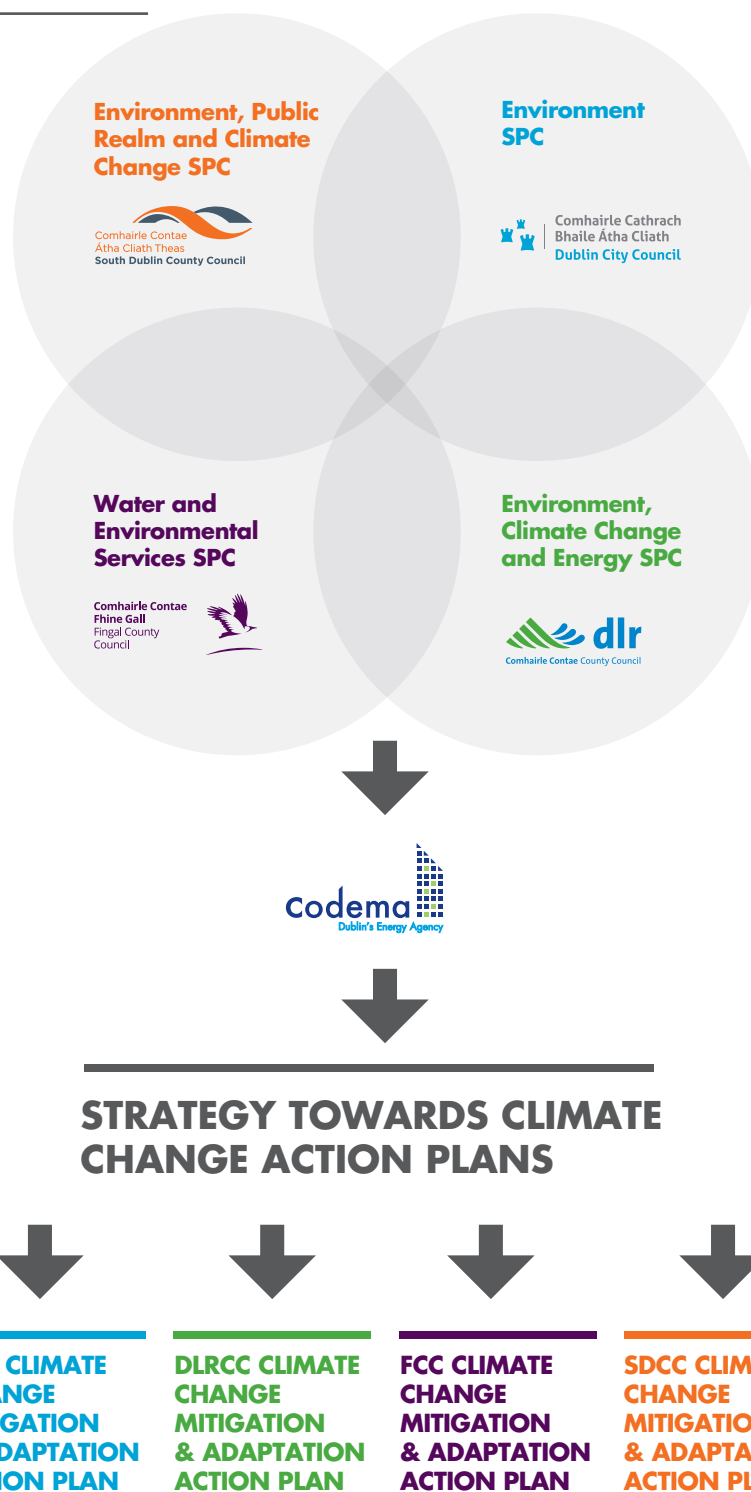
As well as implementing climate change actions through various projects on the ground, another important part of this strategy is communicating the policy messages set out in the Irish Climate Action and Low Carbon Development Act 2015. We will develop these action plans, as required under the Act, in close liaison with the Department of Communications, Climate Action and Environment, the Environmental Protection Agency (EPA) and the Sustainable Energy Authority of Ireland (SEAI).

Internationally, we will liaise closely with the Covenant of Mayors for Climate and Energy, and our already established networks of European cities and associations.

In association with Codema, we will seek technical and financial supports from EU programmes. Private commercial opportunities will be encouraged where possible to deliver solutions, and existing academic partnerships and new areas of research will be incorporated into relevant actions.

“AS WELL AS IMPLEMENTING CLIMATE CHANGE ACTIONS THROUGH VARIOUS PROJECTS ON THE GROUND, ANOTHER IMPORTANT PART OF THIS STRATEGY IS COMMUNICATING THE POLICY MESSAGES SET OUT IN THE IRISH CLIMATE ACTION AND LOW CARBON DEVELOPMENT ACT 2015.”

**FIGURE 2:
PROCESS FOR
DEVELOPING
THE FOUR
ACTION PLANS**

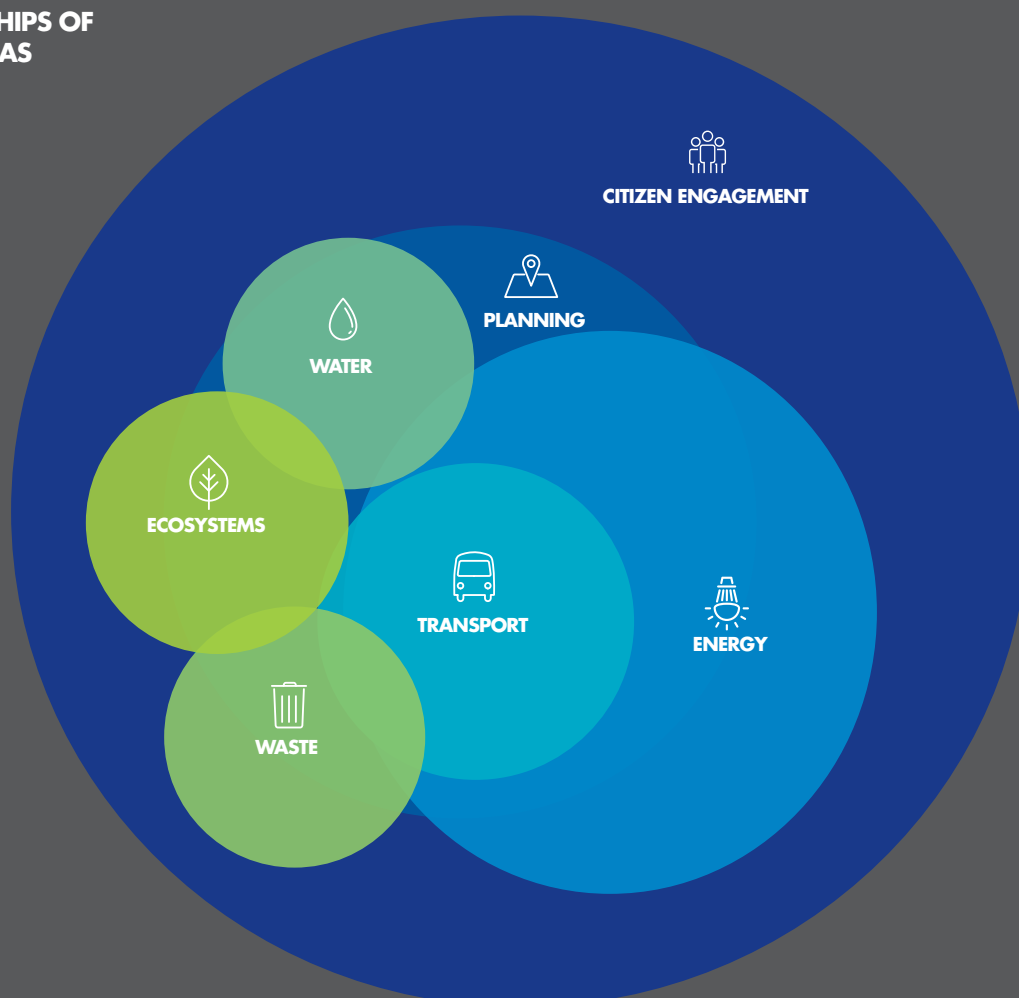


FOCUS AREAS

Seven focus areas were identified as having the greatest potential to help the DLAs move towards a zero-carbon society and adapt to the effects of climate change.

Each focus area has its own challenges and opportunities, but all of these areas are closely interrelated, with overlapping objectives, complementary solutions and indicators. The relationships between the focus areas are illustrated in Figure 3 below, which highlights that Citizen Engagement encompasses all of the focus areas.

**FIGURE 3:
RELATIONSHIPS OF
FOCUS AREAS**



The focus areas can have predominately either mitigation or adaptation solutions, or both. For example, as illustrated in Figure 4, the Energy focus area mainly concerns mitigation (ie. reducing the use of fossil fuels and their associated CO₂ emissions), while Water largely focuses on adapting to changes that are occurring or will occur in the near future due to climate change. Meanwhile, the Citizen Engagement focus area concerns both mitigation and adaptation.

**FIGURE 4:
ADAPTATION AND MITIGATION
BY FOCUS AREA**





CITIZEN ENGAGEMENT

It is no small challenge to communicate effectively and provide clear leadership in order to foster greater civic engagement on climate change and realise the necessary behavioural changes consistent with the upcoming action plans. We will aim to highlight how citizen involvement is important, and how individual actions are part of a larger collective effort. Citizens are ultimately at the heart of climate change, and as can be seen previously in Figure 3, they encompass all of the focus areas within this strategy.

Therefore, if we want to be serious about addressing climate change, we need to involve and engage citizens from the very start. We need to equip citizens with the right information to make informed decisions and assist and empower them to play their part in Dublin's transition to a low-carbon, energy-smart region.

By communicating effectively with citizens about climate change, there is real opportunity to create long-term, positive behavioural change which will have a significant impact on reducing Dublin's carbon emissions.



"WE NEED TO EQUIP CITIZENS WITH THE RIGHT INFORMATION TO MAKE INFORMED DECISIONS AND ASSIST AND EMPOWER THEM TO PLAY THEIR PART IN DUBLIN'S TRANSITION TO A LOW-CARBON, ENERGY-SMART REGION."



CITIZEN ENGAGEMENT IN 2030 AND BEYOND

In 2030, Dublin's citizens will play a central role in local and national decision-making processes in addressing the current and future effects of climate change. Citizens' committees on climate change will allow the everyday public to become key influencers in local and national decision-making processes. These groups will link into the local authorities and other relevant bodies in order to plan and carry out proper climate change awareness programmes and promotional activities that will involve all citizens – from primary-school children, who will learn about climate change and environmental issues as part of their curriculum, right up to workshops catering for senior citizens.

New housing will be nearly carbon-neutral and many of Dublin's existing houses and apartments will be upgraded so that citizens are less at risk of fuel poverty. Citizens will not only be able to get details of the Building Energy Rating (BER) of a specific house or apartment, they will also be able to see the typical energy demand of a specific area and whether renewable energy has been incorporated. Many citizens will also become 'prosumers', meaning that they will be able to generate their own energy through renewable sources and sell any excess energy generated back to the grid.



EXAMPLES OF POSSIBLE ACTION AREAS

Roll out regional public climate awareness programme

Encourage citizens to become 'prosumers' of their own energy

Work with existing local authority networks to engage citizens in the climate change challenge

Involve citizens in more workshops and focus groups on the topic of climate change

Actively reference citizens' involvement when creating and implementing action plans and local development plans

Link in with publications such as citizens' newsletters

Make use of social media to engage citizens and community groups

Promote green tourism and business, eg. cycling tours, food co-ops and local markets



“THE DECISIONS MADE NOW ABOUT LAND USE IN DUBLIN WILL HAVE A LONG-TERM EFFECT ON THE ABILITY OF CITIZENS TO LIVE SUSTAINABLE LIFESTYLES IN THE FUTURE.”



PLANNING

Spatial planning should play a crucial and central role in both short-term and long-term climate change adaptation and mitigation measures. Development Plans allow the local authorities to set and implement policy and objectives that impact on the production of greenhouse gases and minimise the consequences of already changing climate conditions.

Local authority planning has an important co-ordinating role at a strategic level, and overlaps with the various action areas described in this strategy. We have already been proactive in integrating climate change concerns with planning practices. We will continue to create increasingly ambitious planning policy in order to address the growing challenges created by the changes in Irish climate and our use of imported fossil fuels.



PLANNING IN 2030 AND BEYOND

The decisions made now about land use in Dublin will have a long-term effect on the ability of citizens to live sustainable lifestyles in the future.

Making climate change a key part of the planning decision-making means that, in 2030, Dublin's citizens will have more practical, low-carbon methods of transport available for daily commutes, pay lower energy bills thanks to high levels of energy efficiency in new developments, and breathe cleaner air due to reduced fossil-fuel use in transport and buildings.

Strong, evidence-based planning policy will positively affect the way citizens consume energy in Dublin. Traditional planning and sustainable energy planning will be interconnected and will allow us to make strategic decisions on the sustainable development of our districts. This will create well-planned communities where travel distances to education, work and services are reduced, walking and cycling are chosen for more commutes, and local renewable and low-carbon energy sources are integrated into the infrastructure. Vulnerable areas will also be protected from extreme weather events, and integrated and coherent networks of green infrastructure will provide vital ecosystem services to communities, enabling them to be more resilient to the impacts of climate change.

Appropriate planning and engagement with landowners will be used to promote green agricultural processes and adaptation solutions, and carbon sinks will be increased where possible.





EXAMPLES OF POSSIBLE ACTION AREAS

Explore the possibility of energy masterplans for appropriate new development zones

Ensure Development Plan design guidance and standards support climate change mitigation/adaptation

Use planning policy to promote near zero energy buildings for new developments

Use planning policy to promote optimal connection to new low-carbon district heating networks

Promote and integrate Green Infrastructure Strategies into all regional and local planning policies

Develop strategic interconnecting regional and local SuDS plans and ensure integration into all regional and local plans

Ensure that appropriate engineering and environmental sections are involved at planning stage

Develop a regional emissions inventory

Ensure new developments are located close to public transport and are well-served by walking and cycling facilities

“ENERGY USE ACCOUNTS FOR THE VAST MAJORITY OF GREENHOUSE GAS EMISSIONS IN DUBLIN AND, AS SUCH, IS CENTRAL TO THIS STRATEGY.”



ENERGY

Energy use accounts for the vast majority of greenhouse gas emissions in Dublin² and, as such, is central to this strategy.

Energy contributes to climate change in two ways: firstly, by the type of energy supplied, be it coal, gas, oil or electricity and, secondly, through the end-use of energy for heating buildings, fuelling transport or powering lighting and equipment. Fossil fuels are fuels which are non-renewable (i.e. they cannot be replaced) and release carbon dioxide, which is the main contributor to climate change. Renewable sources, such as solar, wind and geothermal energy, contribute much less to climate change and are suitable fuels for the future.

Ireland is 90% reliant on fossil fuels, for directly powering transport and machinery, and indirectly generating electricity and heat. 85% of the fossil fuels used in 2014 were imported into the country, at a cost of €5.7bn³. The emissions associated with this use of unsustainable energy contribute to the global rise in greenhouse gases and the subsequent increase in temperature that is changing weather patterns and sea levels.



ENERGY IN 2030 AND BEYOND

In order for Dublin to meet its ambitious 2030 targets for reducing greenhouse gas emissions, we need to make a significant move from unsustainable fossil fuels to local renewable energy sources. This will depend on the uptake of renewable energy both nationally and locally. In particular, electricity generation must become less carbon intensive.

Electricity production will become less centralised, with localised commercial and residential energy production centres providing low-carbon energy to the surrounding area. Many citizens will become ‘prosumers’, able to generate their own renewable energy using small-scale installations such as roof solar panels, and sell any leftover energy back to the grid. Smart, energy-efficient buildings will adapt to their inhabitants’ needs, reducing energy use and fuel poverty.

District heating systems will recycle heat that is normally wasted from commercial and industrial processes to heat homes and businesses.





EXAMPLES OF POSSIBLE ACTION AREAS

Become leaders in the use of energy efficiency design at project development stage

Take an exemplar role in the use of Green Public Procurement

Support and facilitate low-carbon district heating networks

Move towards near-zero-energy in council new-build buildings, in line with EU policy

Engage with utility and regulatory bodies to help citizens generate, use and sell their own energy

Evaluate the use of Energy Performance Contracts in council buildings

Assess potential for council-led renewable energy projects

Make Dublin's energy supply more secure through increased use of local resources

Ensure new energy infrastructure is climate resilient





TRANSPORT

Transport is one of the main sources of greenhouse gas emissions in Dublin⁴. A sustainable transport system is essential to reduce these greenhouse gas emissions. Vehicles that run on fossil fuels not only release CO₂ into the atmosphere, but also release other polluting materials that are harmful to the public's health.

The size of this challenge cannot be underestimated, given the high number of private car journeys in Dublin and the reliance on road freight transport for moving goods. In addition, the infrastructures that these transport systems are dependent on are also at risk from the current effects of climate change, such as flooding and extreme weather events. Adaptation solutions will be needed to ensure a safe and efficient transport network. A move towards sustainable transport will not only reduce greenhouse gas emissions, but will also lead to a cleaner and more connected region that provides a more positive and healthier environment for its citizens.



"A MOVE TOWARDS SUSTAINABLE TRANSPORT WILL NOT ONLY REDUCE GREENHOUSE GAS EMISSIONS, BUT WILL ALSO LEAD TO A CLEANER AND MORE CONNECTED REGION."



TRANSPORT IN 2030 AND BEYOND

Dublin's transport will be smart, efficient and reliable. Citizens will be able to walk, cycle or take a clean form of public transport to their destination, no matter what part of Dublin they live in. Cycle lanes will be further developed and our public transport networks more connected so that single car journeys will be significantly reduced.

Smart traffic-control management will give priority to public transport, resulting in a more efficient daily commute and a reduction in greenhouse gases. Accurate passenger information systems will continue to evolve and will give commuters real-time arrival and departure information which will help them to decide the quickest routes for all forms of transport.

Designated cycling and pedestrian routes will continue to expand. They will not only help to lower carbon emissions, but will also provide a safe and healthy commute for citizens young and old across the region. Cyclists will have access to secure facilities to store bicycles on all major routes in Dublin and bike sheds will be available at all primary and secondary schools to promote sustainable transport among younger citizens and to help tackle our growing obesity problem.

The market share for electric vehicles, both private and commercial, will have increased significantly. There will be an extensive network of charge points throughout Dublin, and taxi journeys via an e-cab will be more commonplace. Car clubs will provide affordable short-term access to electric vehicles.

Sustainable freight networks will be developed to reduce the need for goods to be delivered by large conventional vehicles. This will result in less heavy goods vehicles (HGVs) in the city and town centre districts and more pedestrianised areas.



EXAMPLES OF POSSIBLE ACTION AREAS

Promote high-density development along public transport corridors through close collaboration with our planning departments

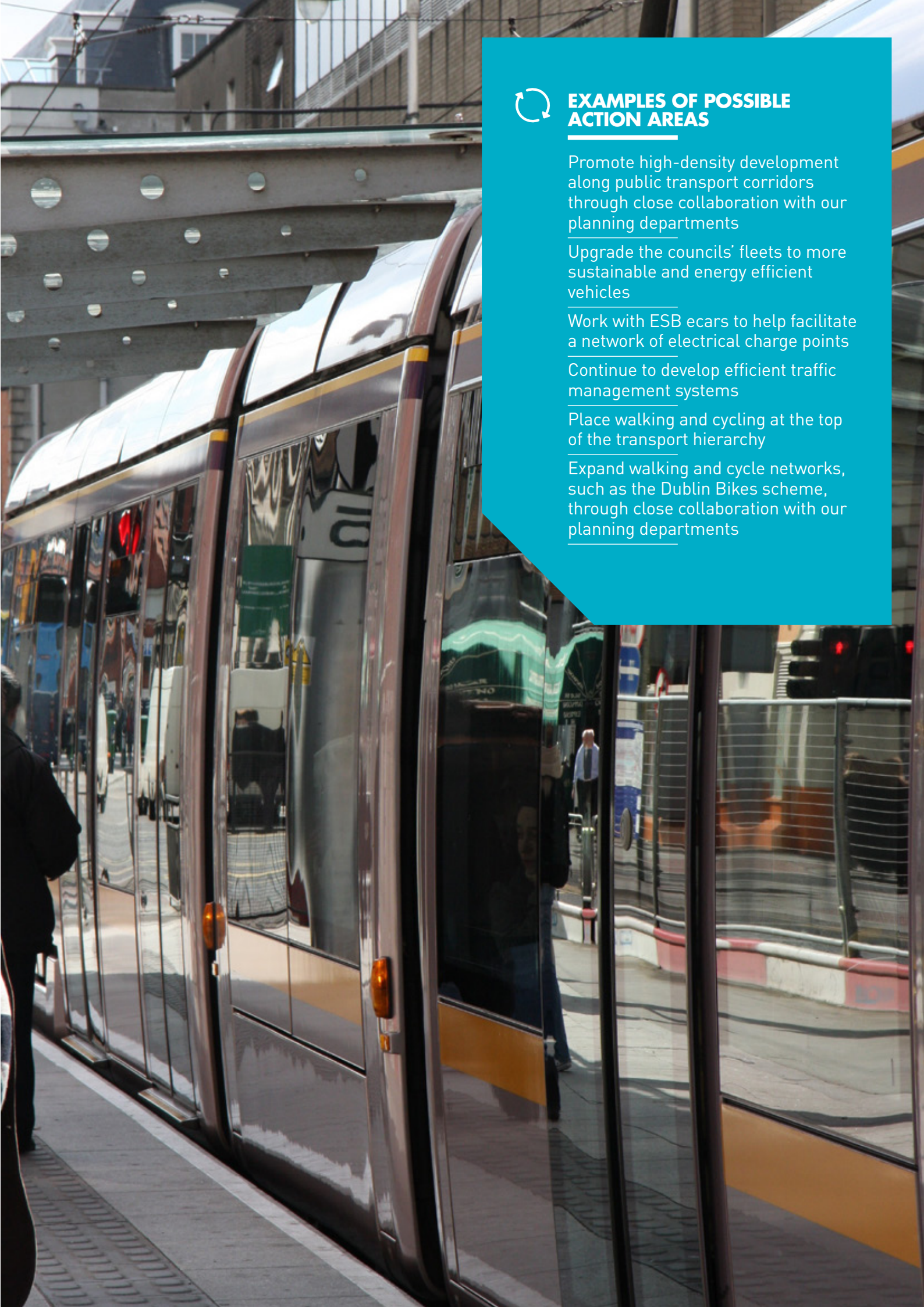
Upgrade the councils' fleets to more sustainable and energy efficient vehicles

Work with ESB ecars to help facilitate a network of electrical charge points

Continue to develop efficient traffic management systems

Place walking and cycling at the top of the transport hierarchy

Expand walking and cycle networks, such as the Dublin Bikes scheme, through close collaboration with our planning departments





WATER

Climate change has an effect both on the ability to deliver water services and on flood events. The main flooding types in the Dublin area are river (fluvial), coastal (tidal), localised intense rainfall (pluvial), dam breach and network flooding, as well as combinations of these flooding types.

Climate change appears to be playing a central role in the increased risk of all these types of flooding in Dublin. The average sea level in Dublin Bay is recorded as rising by over 120mm in the last 16 years⁵, which is twice the global average. This has more than doubled the risk of coastal flooding in the city in this period. Met Éireann recorded a 5% increase in rainfall in Dublin in the last 25 years and an increase in temperature by half a degree during the same period⁶. This increased rainfall, combined with more intense rainfall events over Dublin (particularly in 2002, 2008, 2009 and 2011), appears to have significantly increased the risk of fluvial, pluvial and network flooding over that period.



“CLIMATE CHANGE APPEARS TO BE PLAYING A CENTRAL ROLE IN THE INCREASED RISK OF ALL THESE TYPES OF FLOODING IN DUBLIN.”



WATER IN 2030 AND BEYOND

It is likely that there will be a lot more pressure on drinking water in Dublin, due to more droughts in the summer and an estimated increase of 0.2-0.5°C in global temperatures by 2030⁷. Conservation of water through both use and delivery will become increasingly important. Increased rainfall intensity (probably by 3.5-5% by 2030 in the Dublin area⁸) is likely to lead to more combined sewer overflow (CSO) discharges to watercourses. This increase in rainfall intensity will lead to more overloading of the surface water network, leading to more road flooding, overland flows and property flooding. Waste water treatment infrastructure will be adapted to cope with this increased pressure.

Extra pollution loads from this flooding source will be monitored. New initiatives will be developed and existing initiatives continued to lessen these increases, particularly in areas already at significant risk of flooding.

An increase in Dublin's river flows will cause increases in the design heights of river flows. The mean sea level is forecast to rise between 60mm and 175mm by 2030⁹, which will lead to increases in the wave height created by the winds that will accompany future storms. This would further raise the level of future tidal flood barriers or mitigating measures required.

We will work together with key stakeholders such as Irish Water, and adaptation infrastructure will be developed to make the Dublin region more resilient to storm and surge events. Monitoring and early warning systems will continue to be developed in order to give Dublin citizens and the DLAs the best possible chance to prepare for extreme events. Climate change will become a driving factor in planning in 2030 for all areas of water delivery and treatment and will be a factored risk in all infrastructure built that is susceptible to flooding. Citizens will continue to have an active voice in how flood defences are planned and carried out in their own areas.



EXAMPLES OF POSSIBLE ACTION AREAS

Plan for flood adaptation for the next 50-100 years using the natural environment, including using natural ecosystems to attenuate water

Increase flood awareness in Dublin

Work closely with Irish Water

Advise the public on how to best protect their properties from flooding

Liaise with Irish Water in order to plan for impacts on drinking water supplies

Create flood partnerships with residents' associations in the areas most at risk of flooding

Ensure appropriate engineering input for drainage solutions at the pre-planning stage

Promote the inclusion of SuDS in existing and new developments





WASTE

The waste sector is a relatively minor source of greenhouse gases globally (estimated at between 3-5%)¹⁰. Because of this, it is often overlooked in climate change mitigation and adaption discussions. However, moving to a more sustainable model of waste prevention and material use has strong potential to transform Dublin's waste sector from a minor cause of climate change to a major solution in preventing the creation of greenhouse gases in the first place.

Sustainable waste practices can significantly benefit the climate, particularly when such practices are introduced across the lifecycle of production processes. Reusing secondary materials will mean that less energy is used when extracting raw materials and in production processes, and less emissions are released by various waste treatments. Also, the reuse of secondary materials helps maintain natural storage or carbon sinks which trap greenhouse gases. It is generally accepted that the climate benefits from waste prevention, reuse and recycling outweigh those from energy recovery.

An effective climate change action plan for Dublin needs to consider the effects of waste policy and practices on the overall production of greenhouse gas emissions. In short, better waste practices in the Dublin area will result in lower greenhouse gas emissions, not just in waste treatment but also in wider economic activity, and this will have climate benefits.



“MOVING TO A MORE SUSTAINABLE MODEL OF WASTE PREVENTION AND MATERIAL USE HAS STRONG POTENTIAL TO TRANSFORM DUBLIN'S WASTE SECTOR FROM A MINOR CAUSE OF CLIMATE CHANGE TO A MAJOR SOLUTION IN PREVENTING THE CREATION OF GREENHOUSE GASES”



WASTE IN 2030 AND BEYOND

Waste prevention, reuse and recycling will be central to waste policy and practices in Dublin. While we have made important strides in terms of recycling over the past decade, reuse and waste prevention still play relatively minor, and sometimes niche, roles in our waste practices.

Waste management in Dublin will have a relatively high level of reuse, preparation for reuse and recycling of materials found in municipal waste. There will be a significant decrease in all waste streams being sent to landfill; this includes municipal, construction and demolition and industrial waste streams.

The intended adoption of the circular economy model of waste management at EU level will significantly influence Dublin's waste management in 2030 and beyond. Unlike a linear economy, which takes resources, uses them and discards them, a circular economy tries to keep materials at their highest usefulness and value at all times. Hence, materials are continually reintroduced into the economy and reused in a restorative and regenerative way.

Using the circular economy model, waste management will be more closely connected with production cycles and resource efficiency in 2030 and beyond. Putting in place a successful circular economy model will require cooperation from policy makers, citizens and businesses. The potential economic benefits and job creation associated with a large reuse sector should make it easier to involve these groups.



EXAMPLES OF POSSIBLE ACTION AREAS

Move towards a circular waste economy model

Encourage collaborative methods of consumption (eg. leasing, allotments and the use of the Internet of Things)

Increase public awareness of recycling and collaborative consumption options (i.e. by engaging with Green Schools and community groups)

Work with relevant organisations and the clean-tech sector to develop a vibrant secondary materials market

Collaborate with the business community to integrate resource efficiency and eco-design considerations into their operations

Participate in the annual 'National Reuse Month' initiative each October organised by the Regional Waste Offices



ECOSYSTEMS & BIODIVERSITY

An ecosystem refers to the relationships between different species, their habitats and their local, non-living environment (soils, geology, hydrology, microclimate, etc.). It is the smallest unit of a living system which is functionally independent. Biodiversity refers to the variety of species of plant, animal and micro-organisms in a given area and includes all varieties of ecosystems. Both are sensitive to the impacts of climate change. Climate change can affect the species composition of habitats, exacerbate the spread of climate-related invasive species, and disrupt the balances which exist between the flowering times of plants, lifecycles of insects, and the feeding, breeding, migratory and hibernation times of species.

However, ecosystems and biodiversity can also provide 'services' which influence climate change. Plants play a significant role in removing carbon dioxide from the atmosphere and storing it through photosynthesis. Tree canopy cover can absorb and reduce air pollutants, regulate local air temperatures, and catch rainfall. Wetlands act as significant carbon sinks, store large volumes of water and slow down its flow. However, biodiversity and its associated ecosystems, and the services they provide, can be impeded in many ways. Care needs to be taken if incorporating naturally occurring wetlands into Sustainable urban Drainage System (SuDS), as increased nutrient loading can impact on sensitive or rare species, and impede water purification. Inappropriate 'hard' engineering solutions, particularly along the coastline, can result in coastal squeeze, and the loss of coastal habitats. Tree felling is often a necessary activity and generally replanting occurs, however newly planted trees, particularly in the context of forestry plantations, do not automatically replace the ecosystem services of mature trees and forestry.

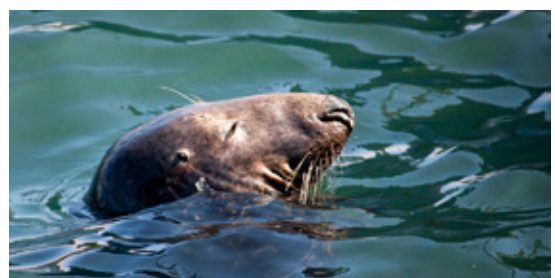
"THE VISION FOR 2030 IS THAT ECOSYSTEMS AND GREEN INFRASTRUCTURE ACROSS THE REGION WILL HAVE BEEN PROTECTED, AND THAT THEIR SUSTAINABLE MANAGEMENT AND DEVELOPMENT WILL BE ONGOING."



ECOSYSTEMS & BIODIVERSITY IN 2030 AND BEYOND

The vision for 2030 is that ecosystems and green infrastructure across the region will have been protected, and that their sustainable management and development will be ongoing. Maintaining their resilience will be pivotal to mitigating and adapting to climate change impacts. Well designed and planned green infrastructure can help achieve this. Constructed wetlands that are appropriately sited and designed will complement the work of natural wetlands. An increase in tree canopy cover, in the right areas with the right species, will significantly bolster the benefits of the existing tree cover. Climate-related invasive species will be under control, and procedures will be in place to manage any further threats.

Awareness and education of the role of green infrastructure for climate adaptation and mitigation among professionals, decision-makers and the general public will have been increased.





EXAMPLES OF POSSIBLE ACTION AREAS

Create effective strategies for controlling climate-related Invasive Alien Species (IAS) and work in partnership with other stakeholders to control IAS throughout the Dublin area

Explore the use of ecosystem services assessments to inform future policies and decisions

Facilitate, develop and implement green infrastructure strategies to promote adaptation and mitigation

Implement the Biodiversity Conservation and Research Programme of the Dublin Bay Biosphere Partnership

Build resilience in natural ecosystems by retaining and rehabilitating key biodiversity elements as part of local biodiversity action plans

Increase tree and hedgerow planting to increase carbon storage potential, reduce urban heating effect, and increase soil water retention

Review, update and implement Biodiversity Action Plans across the Dublin region

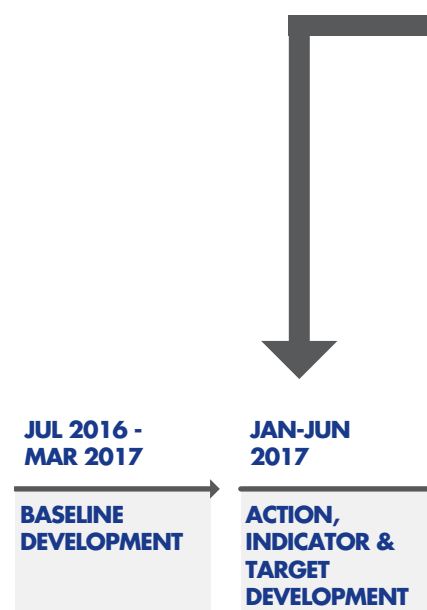
Promote green agricultural processes and engage with farmers through education/training programmes

Promote the development of carbon sequestration systems in land use/planning

**FIGURE 5:
NEXT STEPS FOR
DEVELOPING THE
DLA MITIGATION
AND ADAPTATION
ACTION PLANS**

NEXT STEPS FOR DEVELOPING THE ACTION PLANS

This document is a declaration of intent to prepare ambitious, evidence-based, costed and measurable mitigation and adaptation action plans for each of the four DLAs. Each plan will work towards the 2030 EU targets and beyond, and will provide costings for actions along with social, economic and environmental impacts, compared to a business-as-usual approach. The actions will reflect direct local authority activities, as well as county-wide public and private activities, where possible.



NEXT STEPS:

Jul 2016-Mar 2017

Baseline development

Codema has already completed energy and CO₂ baselines for Dublin City Council and South Dublin County Council showing the total energy and CO₂ outputs in the commercial, residential and transport sectors. This will be expanded to include Dún Laoghaire-Rathdown and Fingal County Councils and will also take into account the agricultural sector. All baselines will be updated to reflect new census and other data as it becomes available. The building energy information will be mapped to show intensities and fuel type. A baseline for each of the focus areas will be developed in the next step.

Jan-Jun 2017

Action, indicator & target development

Through a series of DLA working groups and by collaboration between the DLAs and stakeholders, a set of baselines, actions, indicators and targets will be developed in each of the seven focus areas. These will be peer reviewed and take into account expert opinion, and will be cross referenced and compared with regional and national policy to ensure they are mutually beneficial in delivering the desired solutions.

Apr-Jun 2017

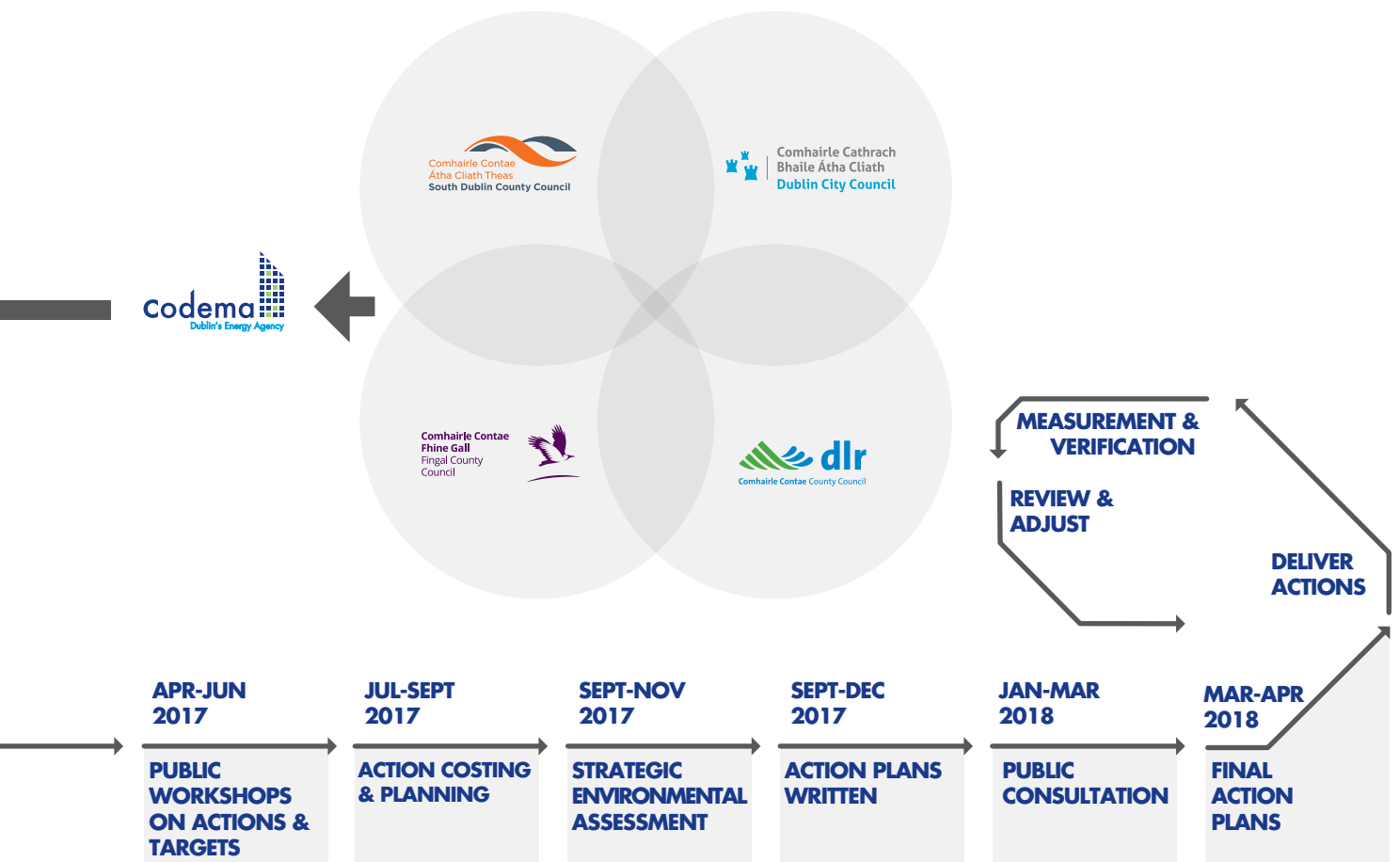
Public workshops on actions & targets

The DLAs will organise public workshops so that citizens can have direct input into the development of the actions and targets that will feature in the adaptation and mitigation action plans.

Jul-Sept 2017

Action costing and planning

All actions will be developed further, costed and responsibilities assigned. They will then be planned in terms of sequencing and scheduling and risk matrixes developed. Review periods with indicator targets will be assigned to each action.



Sept-Nov 2017 Strategic Environmental Assessment

Tender for appropriate consultancy to undertake both a Strategic Environmental Assessment (SEA) and screening for an Appropriate Assessment (AA). The reports will be available for the public consultation process and will be ongoing throughout the draft and public consultation phases.

Sept-Dec 2017 Action Plans written

The actions will be collated into four separate mitigation and adaptation action plans, one for each DLA and an overarching document that summarises these actions for the Dublin region.

Jan-Mar 2018 Public consultation

The action plans will be put forward for the statutory 6-week public consultation period, which will allow citizens to provide further input into the plans. This consultation period will include public workshops and engagement of citizens through traditional and online channels, i.e. social media.

Mar-Apr 2018 Final Action Plans

After all submissions are taken into account, the action plans will go through the appropriate channels for ratification and final publication.

The process for developing the action plans is illustrated in Figure 5 above.

CONCLUSION

There is no doubt that climate change is the great defining challenge of our current generation, and of future generations, and that action is needed now to stop the majority of negative impacts. By stating our intent and setting out a path to tackle this challenge, we have taken the first steps in making Dublin a climate change resilient and CO₂ neutral region.

We need close collaboration between ourselves and all relevant stakeholders and most importantly the citizens of Dublin. By starting this collaboration now we can ensure that the local authority mitigation and adaptation action plans that follow will have a greater chance of success. We believe that local authorities should be leaders in tackling climate change and by publishing this document we are signalling our intent to be just that.

APPENDICES

Glossary

What is climate change?

Climate change is the large-scale and long-term shift in global weather patterns and temperatures. This can be a natural phenomenon caused by events such as ice ages or volcanic activity and has occurred numerous times during the earth's history. However, the recent observed changes in global temperatures and weather patterns, and those predicted for the long-term, have been caused mostly by human activity, namely greenhouse gas emissions.

What is climate change mitigation?

Climate change mitigation consists of actions that reduce or prevent greenhouse gas emissions with the aim of lessening the negative impacts of future climate change events. Actions can include uptake of renewable energy and reduction in the use of energy.

What is climate change adaptation?

Climate change adaptation consists of actions that address the impact of climate change events that are already happening or will happen in the near future. Actions can include flood defences, protecting utilities from large scale storm events, and policy and planning measures aimed at avoiding current and future negative impacts of climate change events.

What is climate resilience?

The ability of a socio-economic system (society) to not only absorb and adapt to negative climate events but to continue to thrive and develop.

What is global warming?

The observed gradual rise in average global temperatures due to human emissions of greenhouse gases which drives climate change events such as sea level rise and changed weather patterns.

What are greenhouse gases?

These are emissions from activities such as burning coal, oil or gas as well as decaying rubbish and farm animal emissions. These activities produce gases such as CO₂ (carbon dioxide) and CH₄ (methane) which act as an insulation layer trapping heat and raising global temperatures.

What is the difference between climate and weather?

Weather is how the atmosphere behaves over short periods of time, while climate is how the atmosphere behaves over relatively long periods of time in a given location.

What is the difference between ecosystems and biodiversity?

Ecosystems are a part of biodiversity. Biodiversity includes diversity within species (genetic diversity), diversity between species (the number of species and the differences between them), and diversity of ecosystems (the relationships between different species, their habitats and their local, non-living environment).

What is a 'prosumer'?

An energy customer who has the ability to generate and store their own energy. An example is a domestic dwelling with solar PV panels which generate electricity that the owner can use immediately, export to the grid or store in batteries for later use.

Abbreviations

AA	Appropriate Assessment
BER	Building Energy Rating
CH ₄	Methane
COP21	21st Conference of Parties
CO ₂	Carbon dioxide
Codema	City of Dublin Energy Management Agency
CSO	Combined Sewer Overflow
DCC	Dublin City Council
DLAs	Dublin Local Authorities
DLRCC	Dún Laoghaire-Rathdown County Council
EPA	Environmental Protection Agency
EPC	Energy Performance Contract
ESB	Electricity Supply Board
EU	European Union
FCC	Fingal County Council
GHG	Greenhouse gas
HGVs	Heavy goods vehicles
IAS	Invasive alien species
M&V	Measurement and Verification
NGO	Non-Governmental Organization
OPW	Office of Public Works
SDCC	South Dublin County Council
SEA	Strategic Environmental Assessment
SEAI	Sustainable Energy Authority of Ireland
SPC	Strategic Policy Committee
SuDS	Sustainable Urban Drainage Systems
UN	United Nations
UNEP	United Nations Environment Programme

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