CORK CITY COUNCIL

SUSTAINABLE ENERGY & CLIMATE ACTION PLAN

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Cork City Council
Comhairle Cathrach Chorcaí

Covenant of Mayors
for Climate & Energy

I, **Councillor Des Cahill**, **Lord Mayor** of **Cork City** have been mandated by the **Elected Members of Cork City Council** on **11 July 2016** to sign up to the **Covenant of Mayors for Climate and Energy**, in full knowledge of the commitments set out in the official Commitment Document and summarised below.

Therefore, my local authority principally commits to:

- Reducing CO_2 (and possibly other greenhouse gas) emissions on its territory by at least 40% by 2030, namely through improved energy efficiency and greater use of renewable energy sources;
- Increasing its resilience by adapting to the impacts of climate change.

In order to translate these commitments into action, my local authority undertakes to fulfil the following step-by-step approach:

- Carry out a **Baseline Emissions Inventory** and a **Climate Change Risk and Vulnerability Assessment**;
- Submit a **Sustainable Energy and Climate Action Plan** within two years following the above date of the municipal council decision;
- **Report progress** at least every second year following the submission of the Sustainable Energy and Climate Action Plan for evaluation, monitoring and verification purposes.

I accept that my local authority shall be suspended from the initiative – subject to prior notice in writing by the Covenant of Mayors Office – in case of non-submission of the above-mentioned documents (i.e. Sustainable Energy and Climate Action Plan and Progress Reports) within the established deadlines.

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Cllr. Des Cahill
Lord Mayor
Cork City

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1 Introduction & Overview

Cork City signed up to the Covenant of Mayors for Climate & Energy on July 11th 2016, thus joining the mainstream European movement by local & regional authorities in the fight against climate change. As the vast majority of energy is consumed in city territories, Cork City has a key burden-sharing role to play in meeting the voluntary commitment of signatories to reduce CO_2 emissions within their territories by at least 40% by 2030. This commitment will require the development of appropriate high-impact policies in the areas of energy conservation, alternative energy & behavioral change. Furthermore, the commitment will require the Council and all sector groups & citizens across the local economy to reflect, engage & deliver on critical "no regrets" changes in respect of sustainable energy use in the near-term and into the future.

Failure to deliver on required measures will potentially have devastating environmental degradational impacts in terms of climate change, natural resource depletion, natural disasters & pollution.

The planet is undoubtedly heading towards a point of *maximum sustainable yield* – Cork City is committed to playing its part in heading off the environmental costs that may be imposed on our future generations.

As part of the Covenant of Mayors (COM) commitment, Cork City Council has committed to preparing this Sustainable Energy & Climate Action Plan (SECAP) within 2 years of becoming a signatory and has also committed to reporting every 2 years on the implementation of the mitigation and adaptation actions that are outlined herein.

The COM commitment will play a key enabling role towards the long-term commitment of Cork City Council to transition to a Low Carbon Society and Economy.

The main objectives of this SECAP are as follows:

- ~ To promote adoption of a greater width & depth of energy efficiency measures within the City
- ~ To reduce energy poverty
- ~ To create employment opportunities in the local economy in the areas of energy efficiency & renewable energy projects
- ~ To enable greater capacity building within all sectors of the local community
- ~ To enable increased visibility & awareness of the required roles & responsibilities of local stakeholders towards meeting National & European climate change objectives.

This document sets out to establish a framework within which strategic national and local targets on energy & energy related carbon emissions can be addressed in a Sustainable Energy & Climate Action Plan. The objectives of the plan are primarily under the topic of Energy Efficiency & Conservation. In particular, we have identified 6 themes that relate directly to the National Energy Efficiency Action Plans, as per the table below:

TOPIC	THEMES	
Energy Efficiency & Conservation	1	Residential Buildings
	2	Municipal buildings, equipment/facilities
	3	Tertiary Buildings (non-municipal)
	4	Public Lighting
	5	Transport
Energy Security & Supply	6	Local electricity & heat/cold production

A comprehensive analysis of final energy consumption & related carbon emissions is reported hereunder, including reporting of these parameters on a "per user cohort" basis – this has been done to create drivers for accelerated mobilization of the necessary mitigation actions.

A total of 23 no. Mitigation Actions are identified to enable achievement of the required 40% CO_2 emission target by 2030 – in fact, the aggregate calculated impact of full delivery of all the proposed Actions is an emission reduction of 43.7%. These Actions are further categorized into actions required over the 2018-2022, 2018-2026 & 2018-2030 periods – this has been done to reinforce the criticality of early & ongoing progress if the stated emission reduction target is to be met.

The 40% emission reduction target, and related Mitigation Actions, are onerous and require an unprecedented commitment from all relevant stakeholders. Partial or total failure to deliver on the required actions will, at best, lead to significantly higher abatement costs in later years – at worst, it will likely contribute towards a national failure to deliver on the binding commitments of the Paris Climate Agreement.

However, this Sustainable Energy & Climate Action Plan also presents many economic & social opportunities. The proposed Actions are not difficult to deliver – the required technical & human resources are available locally. In particular, this SECAP provides an ideal opportunity for Cork City to be an exemplar in the decarbonization of the local & national economies. The majority of the Mitigation Actions are highly investible and will lead to significant employment opportunities in the construction and service sectors. There are also multiple social co-benefits for the citizens of Cork City in terms of increased disposable incomes, health & well-being, etc.

2 Cork City Council Strategy

Cork City Council's Vision is for Cork to be a successful, sustainable regional capital and to achieve a high quality of life for its citizens by balancing the relationship between community, economic development and environmental quality. Amongst the Strategic Environmental Infrastructure Objectives for Cork is to: Promote sustainable settlement and transportation strategies in response to climate change, including measures to reduce energy demand; to reduce anthropogenic greenhouse gas emissions; and to address the necessity for adaptation to climate change. (Cork City Development Plan 2015-21). Cork aims to ensure the protection and resilience of its natural, built, historic and cultural environment, and proactively adapt to climate change and the transition to a low-carbon society. (Cork 2050: Realising the Full Potential)

Cork City Council has prepared this SECAP on a cross-Directorate basis. It has been developed based on input and support from the Directorates of Strategic Planning and Economic Development, Environment & Recreation, Finance and Housing & Community. The Cork City Council Energy Agency has provided much of the Cork City Council specific energy data. Support for the development of the SECAP has been received from energy and transport infrastructure operators, research institutions, business organisations, academic institutions and industry clusters.

Sustainable Land Use Planning is a priority for Cork City Council and is mandated by Ireland's National Planning Framework – Ireland 2050. Proper and sustainable land-use planning has the potential to reduce energy consumption and emissions, while improving quality of life. Actions such as:

- ~ Reducing sprawl by incentivising higher density development and prioritising brown-field development sites (e.g. Tivoli Docks and City Docklands)
- ~ Encouraging mixed use developments
- ~ Prioritising the use of green spaces for climate mitigation and adaptation e.g. sustainable urban drainage solutions
- ~ Encouraging maximum use of solar gain in design of new developments where possible

3 Legislation & Policy Background

3.1 EU Level

Energy Efficiency Directive (2012)

A 2016 update of this Directive establishes a set of binding measures towards helping the EU to reach a 30% energy efficiency target by 2030. National measures to be adopted include the following:

- ~ Energy distributors/sales companies to drive 1.5% energy savings per year through energy efficiency measures
- ~ Public sector to procure energy efficient buildings, products & services
- ~ Governments to carry out energy efficient renovations to at least 3% of the buildings they own/occupy per year
- ~ Easy & free access to energy data to be provided to energy consumers
- ~ Incentivize energy audits for SME's
- ~ Mandatory energy audits for large companies

Renewable Energy Directive

A 2016 update of this Directive requires the EU to fulfill at least 27% of its total energy needs with renewables by 2030.

EU Climate & Energy Framework

This Policy sets the following 2030 targets (from 1990 levels):

- ~ At least 40% GHG emission reductions (binding)
- ~ At least 27% share for renewable energy (binding)
- ~ At least 27% improvement in energy efficiency (endorsed)

3.2 National Level

Climate Action and Low Carbon Development Act (2015)

This is the first ever climate legislation in Ireland and provides a statutory basis for the national objective of transitioning to a low carbon economy by 2050. It enshrines the commitment of the State to GHG mitigation and adaptation measures as well as providing approval for the plans underpinning this transition, namely the National Mitigation Plan and National Adaptation Framework

Ireland's Transition to a Low Carbon Energy Future 2015-2030

This White Paper sets out the framework to guide energy policy to 2030, with the long-term vision of reducing GHG emissions by 80%-95% by 2050 (compared to 1990 levels). The Plan envisages the Citizen being at the center of the required energy transition: the change "from passive consumer to active citizen" and citizen engagement are key principals of this Plan.

National Energy Efficiency Action Plan (NEEAP4) 2017-2020

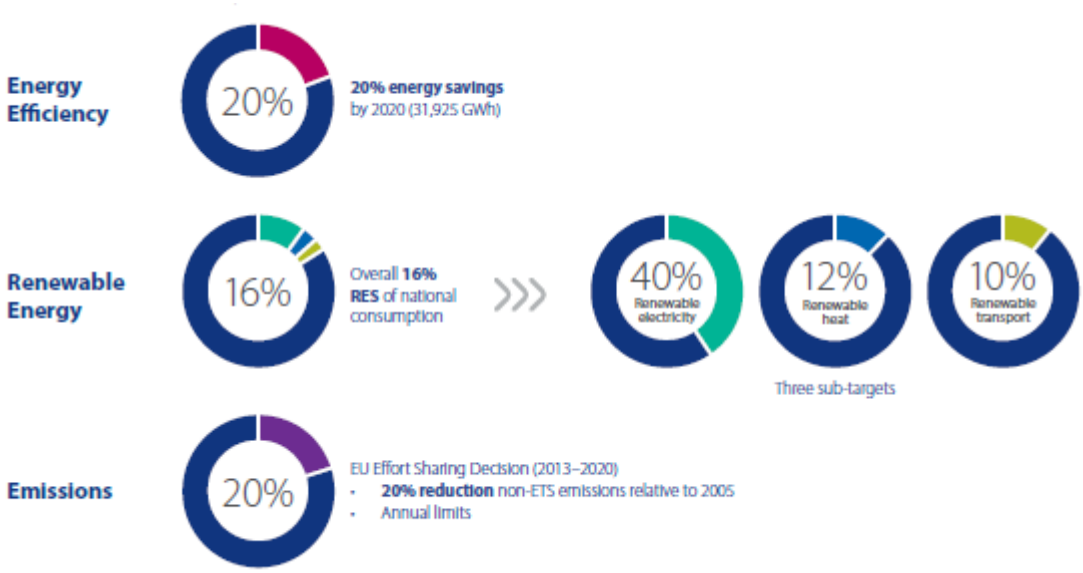
NEEAP4 sets a target of 20% improvement in energy efficiency by 2020 & a more ambitious target of 33% in respect of the public sector. It sets out the scale of energy & emission savings achieved per sector by 2016 and projects the levels of savings envisaged by 2020 under various scenarios. It also sets out details of measures & programs that will deliver towards the savings targets in each sector.

National Mitigation Plan 2017

This first whole-of-government plan sets out the multiple measures requires across several Government Departments to enable the required transition "to a low carbon, climate resilient and environmentally sustainable economy by 2050". In particular, it sets out measures to facilitate the decarbonization of electricity generation, built environment, transports and agriculture/forestry/land use.

National Renewable Energy Action Plan 2010

This sets out national targets in respect of the share of energy from renewable sources to be consumed in transport, electricity and heating/cooling in 2020.



National Headline Energy & Emissions Targets Source: Ireland's Energy Projections, 2017 (SEAI)

3.3 Local Level

Cork City Development Plan 2015-2021

This is the main strategic planning policy document for the city of Cork and is set within the framework provided by the National Spatial Strategy 2002-2020 & South West Regional Planning Guidelines 2010-2022. It has also been prepared having regard to a number of policies/guidelines including the National Climate Change Strategy 2007-2012 & The National Climate Adaptation Framework.

"The vision for Cork City over the period of this Development Plan and beyond is to be a successful, sustainable regional capital and to achieve a high quality of life for its citizens and a robust local economy…"

GOAL 4

PROMOTE SUSTAINABLE MODES OF TRANSPORT AND INTEGRATION OF LAND USE AND TRANSPORTATION

At the national level there is a mandate to reduce emissions caused by fossil-fuelled transport, to reduce use of the private car for commuting and to increase journeys by public transport, walking and cycling. These objectives are central to the land-use and transport strategies in this plan and as well as having the significant societal benefits of a better quality environment can also give health benefits and cost-savings to the individual citizen. Achieving national targets is a long term objective which will require a move to more sustainable land use planning and a significant upgrade to public transport in the greater city area. This strategic goal is particularly addressed in Chapter 5. Transportation.

GOAL 6

TACKLE CLIMATE CHANGE THROUGH REDUCING ENERGY USAGE, REDUCING EMISSIONS, ADAPT TO CLIMATE CHANGE AND MITIGATE AGAINST FLOOD RISK

A key aim of the Plan is to reduce emissions that lead to global warming through sustainable energy usage in transport and buildings. It also aims to mitigate and adapt to the challenges of climate change such as the increased risk of flooding, through the design, layout and location of appropriate land-uses. This is particularly addressed in Chapter 12. Environmental Infrastructure and Management and Chapter 16. Development Management.

4 Baseline Emissions Inventory

4.1 Introduction

The Baseline Emissions Inventory (BEI) for Cork City includes the key sectors of the City's economy i.e. housing, tertiary, non-ETS industry, municipal and transport. The energy usage profile of each sector was developed using bottom up data that reflect local conditions, wherever possible. Where localized data was insufficient, we leveraged sectorial national energy usage statistics published by SEAI and applied socio-economic multipliers reflecting the size of local sectorial activity. The dataset of energy usage developed in this bottom-up manner was then calibrated with city-level energy supply data provided by energy utilities for natural gas and electricity.

2011 was selected as the Baseline year for the BEI, for several reasons. Firstly, a wide range of statistical data is readily available for that year. Secondly, it is representative of a business as usual situation in terms of socio-economic conditions within the city. 2011 represents a midpoint between the economic boom years of 2005-2008 and the subsequent recessionary low point and the associated slump in energy usage.

4.2 Methodology & Findings – Residential Sector

Cork City housing stock was profiled using Census 2011 and Census 2016 data published by the CSO, which provide data on the breakdown of the stock per age of construction, as well as distribution of dwelling types (detached, apartment, etc.) and main fuel for central heating.

The latest version of the Domestic Building Energy Rating (DBER) database was used to determine the energy usage of dwellings for different age bands based on a sample of almost 19,000 BERs. BER data covers space heating, domestic hot water, lighting, pumps & fans energy usage. This data is then complemented with SEAI's Energy Policy Statistical Support Unit (EPPSU) data to cover appliances, cooking, ICT, etc. to develop a full profile of energy usage in housing in the city.

This data was calibrated against gas supply data provided by Gas Network Ireland for metering points within the city boundaries.

Findings:

- ~ Total Final Energy Consumption (Residential) = 975.82GWh (39.6% of Total Final Consumption)
- ~ Consumption breakdown by category: private housing (86.35%), public housing (13.65%)
- ~ Total Emissions (Residential) = 278.01ktCO_2eq. (37.5% of Total Emissions)

4.3 Methodology & Findings – Municipal buildings, equipment/facilities

Cork City Council's own energy usage at its buildings and facilities is tracked on an annual basis based on meter reading data for electricity and gas, and on fuel cards records for their vehicle fleet. This data is collected in the framework of the City Council's energy management processes as well as its reporting for the Public Sector Obligation under the Energy Efficiency Directive (-33% energy usage by 2020).

Findings:

- ~ Total Final Energy Consumption (Municipal buildings, equipment/facilities) = 37.06GWh (1.51% of Total Final Consumption)
- ~ Total Emissions (Municipal buildings, equipment/facilities) = 12.8ktCO_2eq. (1.73% of Total Emissions)

4.4 Methodology & Findings – Tertiary Sector & non-ETS Industry

Energy usage in the tertiary sector was primarily established based on the combination of 2 data sources:

a) Anonymised data from the non-domestic Building Energy Rating (NDBER) assessment database (a sample of 1122 buildings/facilities in Cork City), from which were derived average figures for treated floor area, fuel and electricity usage for buildings/facilities belonging to a certain category (e.g. schools, warehouses, retail units, etc.).

b) An anonymised inventory of the all the non-residential buildings/facilities within the city was provided by Cork City's Rates (local authority tax) collection department, which gave the number of units in each building/facility category within the city.

These figures were compared and calibrated with CIBSE TM46 benchmark fuel and electricity usage figures, building survey data obtained from other studies and national average specific fuel and electricity usage per employee obtained from SEAI's national statistics for the services sector.

Findings:

- ~ Total Final Energy Consumption (Tertiary) = 814.95GWh (33.1% of Total Final Consumption)
- ~ Consumption breakdown by category: private tertiary (54.8%), public tertiary (excl municipal) (18.9%) & non-ETS Industry (26.3%)
- ~ Total Emissions (Tertiary) = 206.12ktCO_2eq. (33.1% of Total Emissions)

4.5 Methodology & Findings– Public Lighting

Public lighting electricity usage data where obtained from Cork City Council's energy use records.

Findings:

- ~ Total Final Energy Consumption (Public Lighting) = 9.63GWh (0.39% of Total Final Consumption)
- ~ Total Emissions (Public Lighting) = 4.71ktCO_2eq. (0.64% of Total Emissions)

4.6 Methodology & Findings – Transport

The baseline inventory is derived from 2011 statistics from CSO (Transport Omnibus) for Cork County and State in respect of private cars, commercial private and PSVs (taxis), such as average mileage, number of vehicles and tkm (tonne kilometres). Calculations are carried out to abstract Cork City ownership/usage data, from the county-wide CSO data, using typical rural and city transport data for 2011.

Data for the Cork City Council transport fleet is also used along with statistics from Bus Eireann for Cork City routes. This data is combined with 2011 efficiency and emissions data for vehicles (sourced from SEAI) as well as average age of private cars to estimate the overall energy usage and fuels breakdown for transport in Cork City.

Findings:

- ~ Total Final Energy Consumption (Transport) = 623.47GWh (25.33% of Total Final Consumption)
- ~ Consumption breakdown by transport category: private transport (94.6%), public transport (4.25%) & municipal fleet (1.15%)
- ~ Total Emissions (Transport) = 157.58ktCO_2eq. (21.25% of Total Emissions)

4.7 Summary of Final Energy Consumption & Related Emissions

Sector/User Group	Fuel Consumption (GWh)	CO_2 Emissions (kt)
Municipal & Local Authority (incl LA housing and public lighting)	340.8	96.2
Tertiary Buildings, equipment, facilities, Industry (non-ETS)	660.9	249.6
Private Residential	842.6	240.1
Transport	616.5	155.8
TOTALS	**2,460.9**	**741.6**

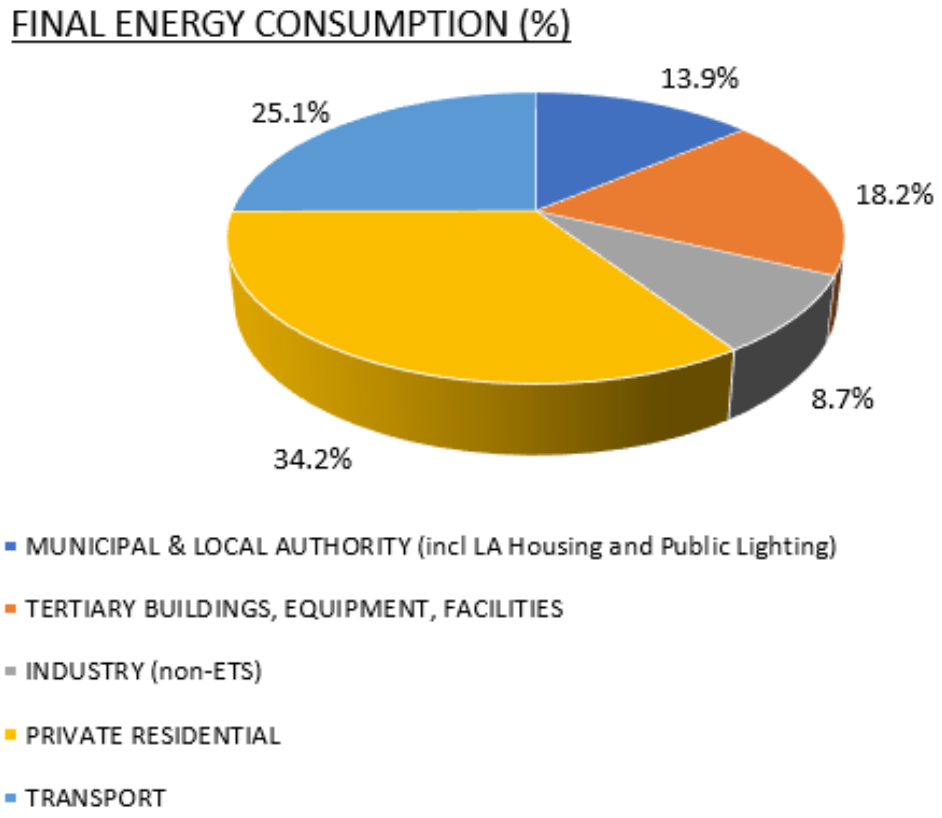


Figure 1: Final Energy Consumption, per user group

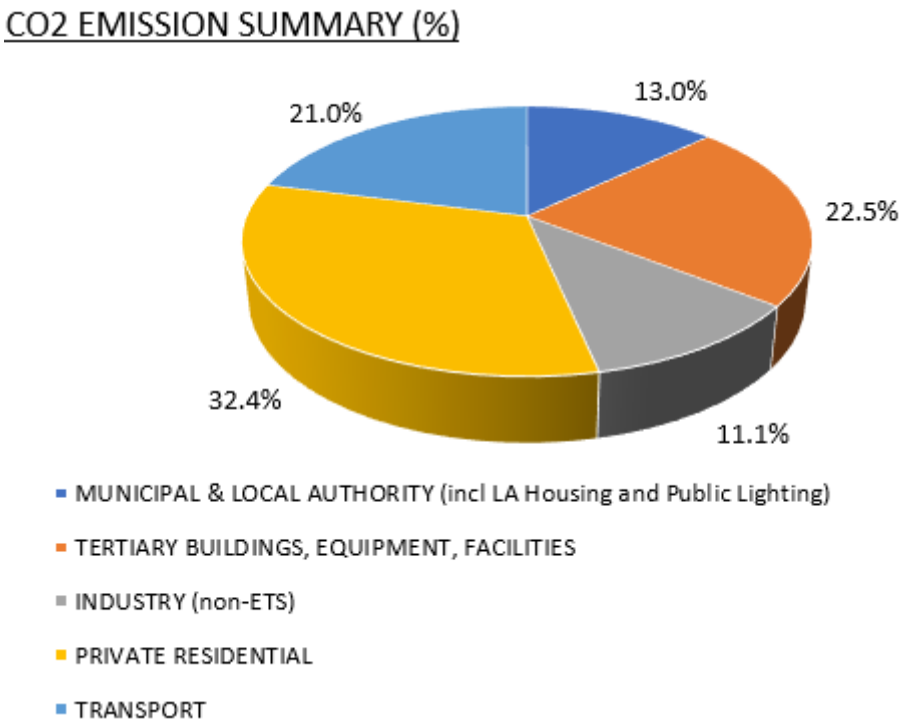


Figure 2 CO2 Emissions, per emitter group

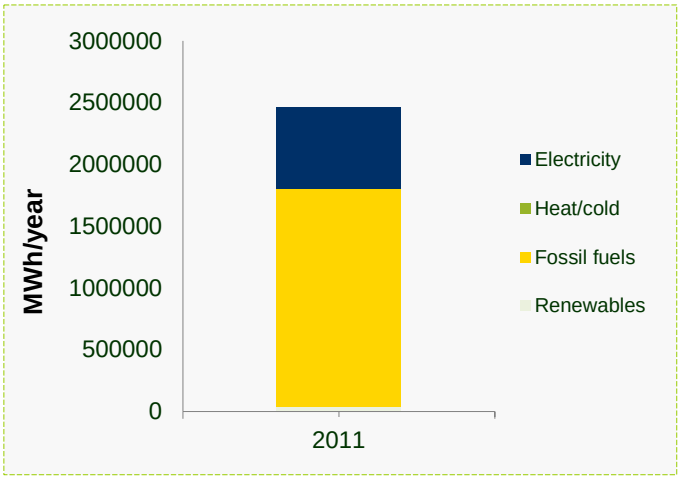


Figure 3: Final Energy Consumption, per energy carrier

5 Proposed Mitigation Actions

5.1 Residential buildings

ACTION 1	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Medium depth retrofit of 100% Local Authority housing stock	Cork City Council	€54.7M	9,724

Rationale

- ~ Bespoke analysis tool used to assess actions to deliver 32% CO_2 savings on baseline, across the stock as a whole (improved BER rating C1-B3 level).
- ~ Assumed actions incl building fabric upgrades, improved air-tightness & energy efficient lighting
- ~ Average cost €6,000/home, excl grant-aid

ACTION 2	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Deep retrofit of 100% Local Authority housing stock (on an incremental basis)	Cork City Council	€179.4M	9,922

Rationale

- ~ Bespoke analysis tool used to assess actions to deliver 60% CO_2 savings on baseline, across the stock as a whole (improved BER B2-B1 level).
- ~ Assumed additional actions incl enhanced building fabric upgrades, further improved air-tightness, heat recovery ventilation & boiler replacement
- ~ Average cost €25,000/home, excl grant-aid

ACTION 3	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Impact of nZEB new-build standard on replacement stock	Cork City Council/Building Control Authority	tbc	13,662

Rationale

- ~ Calculated on basis of all new-builds from 2020
- ~ Assumed stock replacement rate of 0.5%

ACTION 4	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Retrofit of private housing stock (50% medium, 50% deep)	Private Sector	€572M	78,056

Rationale

- ~ Analysis as per Actions 1 & 2.
- ~ Potential to deliver 60% CO_2 savings.
- ~ Average cost €6,000/home, excl grant-aid (medium retrofit)
- ~ Average cost €25,000/home, excl grant-aid (deep retrofit)

ACTION 5	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Promotion of advisory service & supports for Community Action	Cork City Council	€1.2M	tbc

Rationale

- ~ It is projected that this action can deliver 10% uptake of deep retrofits

5.2 Municipal buildings, equipment/facilities

ACTION 1	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Continue resourcing of energy management unit in Local Authority	Cork City Council	€1.9M	See Actions 2-6
Rationale ~ Senior & Junior Engineer (17 years)			

ACTION 2	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Smart energy ICT infrastructure (controls, metering, monitoring)	Cork City Council	tbc	640
Rationale ~ TBC			

ACTION 3	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Internal campaign regarding sustainable energy awareness & behavioral change	Cork City Council	€0.12M	896
Rationale ~ €10k pa (12 years)			

ACTION 4	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Rolling program of energy audits & feasibility studies	Cork City Council	€0.348M	Included in Actions 5 & 6
Rationale ~ 3 audits/pa deep projects (1st 8 years) & 2 audits/pa medium depth projects (following 9 years)			

ACTION 5	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Establish energy efficiency fund & other financing tools	Cork City Council	€0.353M	Included in Action 6
Rationale ~ Projected costs based on 60% equity on CAPEX, 6% financing costs, fund management costs			

ACTION 6	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Energy efficiency/renewable energy capital investment program (excl water & public lighting)	Cork City Council	€6.741M	2,679
Rationale ~ Capital cost estimated from potential savings and acceptable payback norm			

ACTION 7	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Sustainable energy capital investment program for water utilities	Irish Water/Ervia	€3.257M	1,193
Rationale ~ Capital cost estimated from potential savings & acceptable payback norm			

5.3 Tertiary buildings

ACTION 1	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Establish Energy Champion as a key driver for energy transition within Cork City, with tertiary & community stakeholders	Energy Champion (Energy Cork)	€1.2M	10,306
Rationale ~ Senior Engineer, office support (12 years)			

ACTION 2	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Drive capital investment on PPP basis (Better Energy Communities or similar), with Energy Champion as coordinator	Energy Champion (Energy Cork)	€77.95M	53,488
Rationale ~ Capital cost estimated from potential savings & acceptable payback norm			

ACTION 3	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Promote energy management standards within tertiary sector (eg. SEAI EnergyMAP, ISO50001)	SEAI	€0.19M	14,428
Rationale ~ Annual awareness raising and training campaigns			

ACTION 4	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Pilot Smart City District	SCC District Project Team	TBC	TBC
Rationale ~ To be designed and budgeted as part of Cork's Smart City and Community 2018 project application development			

5.4 Public Lighting

ACTION 1	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Continuing replacement of SOX lanterns with more efficient lamps (SON, LED) & enhanced control capability	Cork City Council	€6.79M	1,206
Rationale ~ Capital cost estimated from potential savings & acceptable payback norm			

5.5 Transport

ACTION 1	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Deployment of EV's & CNG vehicles	Cork City Council, DTTAS, SEAI, DCCAE	€64.24M	3,505

Rationale

- ~ Projected 800,000 (42%) EV & Hybrid passenger cars by 2030 (per Alternative Fuels Infrastructure for Transport in Ireland – 2017-2030)
- ~ Assume ICE efficiencies for new vehicles remain at current levels
- ~ Projected 23,005 EV & 4,650 CNG goods vehicles in Ireland by 2030 (per Alternative Fuels Infrastructure for Transport in Ireland – 2017-2030)
- ~ Projected 450 EV & 1,500 CNG buses in Ireland by 2030 (per Alternative Fuels Infrastructure for Transport in Ireland – 2017-2030)
- ~ Costs based on National Mitigation Plan (Measures T18, T19 & T3)

ACTION 2	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Modal shift to sustainable transport, walking, cycling and public transport	Cork City Council, NTA, DTTAS, Public Transport Providers, SEAI	€377.7M	40,226

Rationale

- ~ 22% of all private car journeys to shift to non-motorized transport by 2030 & 22% of all remaining private car journeys to shift to public transport by 2030 (measure obtained from National Mitigation Plan)
- ~ This Action shall be supported by the following:
  - o City Centre Movement Strategy
  - o Strategic Transport Corridor Studies
  - o Walking Strategy
  - o Cork Metropolitan Network
  - o Education & awareness campaign to promote the benefits of modal shift
- ~ Costs based on National Mitigation Plan (measures T1 & T2)

ACTION 3	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Smart Driving Program	Cork City Council, DTTAS, SEAI, DCCAE	€2.29M	11,407

Rationale

- ~ Estimate 10% reduction in fuel usage by uptake in eco-driving by 2030 (measure outlined in National Mitigation Plan)
- ~ Costs based on National Mitigation Plan (measure T22)

5.6 Local Electricity Generation

ACTION 1	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Improved planning framework for renewable energy planning applications, staff training, public consultation	Cork City Council	€0.08M	8,243
Rationale ~ Costs to cover background studies, training, consultation work			

ACTION 2	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Develop City Decarbonization & District Energy Action Plan	Cork City Council & Energy Champion (Energy Cork)	€0.03M	8,243
Rationale ~ Costs to cover consultation work			

5.7 Local Heat/Cold Production

ACTION 1	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
Facilitate biomethane injection into gas grid	Cork City Council & Gas Networks Ireland	€109.95M	46,888

Rationale

- ~ Calculation bases in lifecycle cost of energy data provided by SEAI 2017 Biomethane studies

5.8 Summary of Mitigation Actions

The following table lists all the proposed actions under headings of Short Term Actions (2018-2022), Short-Medium Action Actions (2018-2026) & Short-Long Term Actions (2018-2030):

ACTIONS	RESPONSIBLE BODY	COST	PROJECTED CO2 REDUCTIONS (t CO_2/a)
SHORT TERM ACTIONS (2018-2022)			
MUNICIPAL BUILDINGS/EQUIPMENT & FACILITIES: Continue resourcing of energy management unit in Local Authority	Cork City Council	€1.9M	TBC
MUNICIPAL BUILDINGS/EQUIPMENT & FACILITIES: Internal campaign regarding sustainable energy awareness & behavioral change	Cork City Council	€0.12M	896
TERTIARY BUILDINGS: Establish Energy Champion as a key driver for energy transition within Cork City, with tertiary & community stakeholders	Energy Champion (Energy Cork)	€1.2M	10,306
HOUSING: Promotion of advisory service & supports for Community Action	Cork City Council	€1.2M	TBC
TERTIARY BUILDINGS: Promote energy management standards within tertiary sector (eg. SEAI EnergyMAP, ISO50001)	SEAI	€0.19M	14,428
TERTIARY BUILDINGS: Pilot Smart City District	SCC District Project Team	TBC	TBC
TRANSPORT: Smart Driving Program	Cork City Council, DTTAS, SEAI, DCCAE	€2.29M	11,407
LOCAL ELECTRICITY GENERATION: Improved planning framework for renewable energy planning applications, staff training, public consultation	Cork City Council	€0.08M	8,243
LOCAL ELECTRICITY GENERATION: Develop City Decarbonization & District Energy Action Plan	Cork City Council & Energy Champion (Energy Cork)	€0.03M	8,243
MUNICIPAL BUILDINGS/EQUIPMENT & FACILITIES: Smart energy ICT infrastructure (controls, metering, monitoring)	Cork City Council	TBC	640
TERTIARY BUILDINGS: Drive capital investment on PPP basis (Better Energy Communities or similar), with Energy Champion as co-ordinator	Energy Champion (Energy Cork)	€77.95M	53,488
PUBLIC LIGHTING: Continuing replacement of SOX lanterns with more efficient lamps (SON, LED) & enhanced control capability	Cork City Council	€6.79M	1,206
MUNICIPAL BUILDINGS/EQUIPMENT & FACILITIES: Establish energy efficiency fund & other financing tools	Cork City Council	€0.353M	TBC
SHORT - MEDIUM TERM ACTIONS (2018-2026)			
HOUSING: Medium depth retrofit of 100% Local Authority housing stock	Cork City Council	€54.7M	9,724
MUNICIPAL BUILDINGS/EQUIPMENT & FACILITIES: Rolling program of energy audits & feasibility studies	Cork City Council	€0.348M	TBC
TRANSPORT: Modal shift to sustainable transport, walking, cycling & public transport	Cork City Council, NTA, DTTAS, Public Transport Providers, SEAI	€377.7M	40,226
SHORT - LONG TERM ACTIONS (2018-2030)			
HOUSING: Deep retrofit of 100% Local Authority housing stock (on an incremental basis)	Cork City Council	€179.4M	9,922
HOUSING: Retrofit of private housing stock (50% medium, 50% deep)	Private Sector	€572M	78,056
HOUSING: Impact of nZEB new-build standard on replacement stock	Cork City Council/Building Control Authority	TBC	13,662
TRANSPORT: Deployment of EV's & CNG vehicles	Cork City Council, DTTAS, SEAI, DCCAE	€64.24M	3,505
LOCAL HEAT/COLD PRODUCTION: Facilitate biomethane injection into gas grid	Cork City Council & Gas Networks Ireland	€109.95M	46,888
MUNICIPAL BUILDINGS/EQUIPMENT & FACILITIES: Sustainable energy capital investment program for water utilities	Irish Water/Ervia	€3.257M	1,193
MUNICIPAL BUILDINGS/EQUIPMENT & FACILITIES: Energy efficiency/renewable energy capital investment program (excl water & public lighting)	Cork City Council	€6.741M	2,679

6 Adaptation

6.1 Assessment of Risks & Vulnerabilities

Cork City Council has assessed the relevance of certain current Climate Hazard Types as follows:

- ~ High Hazard Risk Level: Floods
- ~ Moderate Risk Level: Sea level rise, storms, extreme precipitation, extreme heat

The primary climate change risk to Cork City is an increase in frequency and severity of flooding events. Particular risk factors for the city include: it's low level city centre (portions of the city centre are at or slightly above sea level; it's position at the head of a tidal river and estuary; the hilly terrain surrounding the city centre to the North and South.

It is recognised that elderly, disabled or economically disadvantaged citizens may be particularly vulnerable to, and less well able to adapt to, the impacts of climate change.

Cork City Council has, along with the Office of Public Works (OPW) carried out extensive flood risk assessment studies and flood mitigation measures have been proposed, with a major city-wide €140 million flood defence plan at the detail planning stage.

Regional Climate Change Offices are to be established in 2018 to implement the recently-published National Adaptation Framework. This framework document will lead the Cork City Council adaptation response.

6.2 Proposed Adaptation Actions

Proposed adaptation actions will be considered in detail in future revisions of the SECAP, particularly in light of the recent National Adaptation Framework. However, it is expected that adaptation action will include, amongst others:

- Flood defence adaptation works
- Sustainable urban drainage systems and Green Roofs
- Improved land-use planning and planning procedures recognising the need to adapt to the impact of climate change including appropriate development levels in city centre locations

7 Monitoring & Reporting

Cork City Council has committed to ongoing monitoring of progress made towards the targets set out in this SECAP. Furthermore, it will submit an Implementation Report every two years for the purposes of evaluating, monitoring & verifying the progress made. This report will include an updated emission inventory (*monitoring emission inventory*), quantified analysis on the measures implemented, a qualitative analysis of the implementation process as well as proposed corrective measures where necessary.

Acronyms

COM: Covenant of Mayors
SECAP: Sustainable Energy & Climate Action Plan
EU: European Union
SME: Small & Medium-Sized Business
GHG: Greenhouse Gas
NEEAP4: 4th National Energy Efficiency Action Plan
SEAI: Sustainable Energy Authority of Ireland
BEI: Baseline Emissions Inventory
CSO: Central Statistics Office
BER: Building Energy Rating
DBER: Domestic Building Energy Rating
NBER: Non-Domestic Building Energy Rating
EPPSU: Energy Policy Statistical Support Unit (of SEAI)
ICT: Information & Communication Technology
ETS: Emission Trading Scheme
CIBSE: Chartered Institute of Building Services Engineers
nZEB: Nearly Zero Energy Buildings
PPP: Public Private Partnership
EV: Electric Vehicles
CNG: Compressed Natural Gas
DTTAS: Department of Transport Tourism & Sport
DCCAE: Department of Communications Climate Action & Environment