

Sectoral Emissions Ceilings

Q4: What do you view as the key actions required to ensure the emission reduction targets set out in the Sectoral Emission Ceilings are met?

[REDACTED] Codema:

Summary of Key Points:

Bottom-up, local-level climate and energy initiatives are a key enabler of distributed and effective climate action - Codema has pioneered, supported and delivered multiple programmes outlined below, which critically have large potential to be scaled across Ireland.

- Spatial energy planning such as Codema's Dublin Region Energy Masterplan (1).
- An aggregated energy performance contract based project delivery system such as Codema's DeliveREE project (2).
- Local level awareness and engagement, such as Codema's award winning Home Energy Savings Kits (3).
- Evidence-based, holistic and democratic regional roadmap approaches such as Codema's Zero Together initiative (4).
- Rapid deployment of district heating is essential to keep Ireland within our sectoral emissions ceilings for buildings.
- Rapid uptake of active travel is essential to keep Ireland within our sectoral emissions ceilings for transport.
- Publication of fossil fuel boiler phase out dates, and associated scaling back of the gas distribution network serving the residential, commercial, and public sectors on the path to 2050, reserving green gas for the power generation and industrial sectors.

Full Response:

Bottom-up, local-level climate and energy initiatives are a key enabler of distributed and effective climate action - Codema has pioneered, supported and delivered multiple programmes outlined below, which critically have large potential to be scaled across Ireland.

Spatial energy planning is a powerful tool - it includes local level energy supply and demand analyses and emissions analyses that can identify opportunities and synergies not visible at a national level. It allows local authorities to create evidence-based policies and actions which affect CO2 emissions county-wide, by using the local authority's powers in spatial planning, land-use, planning policy and public infrastructure.

An example of local-level synergies and opportunities, is district heat scheme viability, or sector integration opportunities. Codema's Dublin Region Energy Masterplan is a recent example of this type of work, and one that could be replicated across Ireland. It provides realistic, evidence-based pathways for the Dublin Region to achieve its carbon emission reduction targets to 2030 and 2050, on a spatial basis, allowing for geographically based energy planning.

An aggregated energy performance contract based project delivery system to accelerate delivery of energy projects for the commercial and public sector. Codema's DeliveREE project is an effective example of a 'one-stop-shop- project implementation unit that could be a model for scaling around Ireland.

DeliveREE will accelerate the formation of large-scale projects by standardising the project development process, allowing projects of various types and sizes to be aggregated together to create viability and scale.

Aggregation and scaling enables the use of energy performance and energy supply contracts whose performance guarantees are both critical for achieving value for money and provide a mechanism for the involvement of private capital.

The client does not need to provide 100% up-front funding, and the performance risk is placed on the Energy Services Contractor (ESCO), as the technical expert.

A key part of the programme is creation of an innovative, standardised finance and delivery system for rolling out energy-efficiency and renewable energy projects, at mass scale, and bundled together to gain large-scale impact.

Local level awareness and engagement, such as:

Codema's award winning Home Energy Savings Kits, an effective community based initiative. A year-long study by SEAI and Codema in 2018 of 250 users of the kits, found that 86% of respondents said that the kit made them think about how they use energy in their homes. Sixty per cent of respondents also cited that the kit triggered an intention to act in terms of home upgrades and 71% wanted further engagement (e.g. in terms of events, workshops, etc.) showing a desire by the majority of people using the kit to increase their level of energy awareness even further. Additionally, 97% said that they would recommend the kit to someone else.

SEAI Sustainable Energy Communities (SECs). Codema is the regional coordinator for the Dublin and Mid-East region for the SEC programme, which currently consists of 164 communities. This is an excellent programme with high potential, and should continue to be scaled across Ireland, however, there are some barriers to reaching its full potential:

- Need for improved access to technical expertise for SECs - this could be facilitated by additional training for local ambassadors. Associated with this, there is potential for improvements to the energy master plan process, and administrative burden of the SEC application process.
- Cost, affordability, and project risk challenges.
- There is space for enhanced local engagement to recruit more community support into the SEC programme, to help scale and build further capacity.
- Availability, trust and quality considerations when sourcing contractors. Additionally, there are challenges where finance and contractor coordination interact (many individual householders who have secured a builder to carry out work are not prepared to wait to get this work done within the SEC process, while in the same community there can be people who want to get work done but cannot finance it). - - New processes for project aggregation that link with the 'One-Stop-Shop' approach can address some of these issues.
- There is a need for more support in the 'Do' phase of the 'Learn, Plan, Do' framework. An avenue for providing more support could be to create a structured

process that supports SECs to engage with 'One-Stop-Shops'. Codema sees large potential in this scheme for both community engagement and delivery of retrofit targets, if SECs are used as an aggregator to bundle projects for one-stop-shops.

Evidence-based, holistic and democratic regional roadmap approaches such as Codema's Zero Together initiative.

Zero Together:

Brings together a comprehensive evidence base, community engagement, and multi-sectoral engagement across public, commercial, industrial and academic sectors, acting as a catalyst and multiplier of climate action across these sectors.

Will chart a collaborative, societally supported pathway to net-zero emissions, rooted in science, but critically, with a social licence via its engagement mechanisms.

Sets a vision of Dublin as a climate friendly, clean, healthy and inclusive county, and will create a plan to address the 95% of emissions in Dublin not directly managed by the public sector.

Core elements include:

- Creation of a cross-sector roadmap to net-zero for Dublin.
- Creation of a 'Transition Team' to support management of the net-zero roadmap with cross-sectoral engagement.
- A plan for a regional level version of a citizen's assembly on climate and energy based in Dublin, known as a mini-public or citizen's jury.

Evidence shows (5):

- The need for and effectiveness of bottom-up public engagement, such as a citizen's jury, to complement traditional top-down participatory models. Deliberative processes, when implemented properly, "can lead to better policy outcomes, enable policy makers to make hard choices and enhance trust between citizens and government".
- Representative deliberative mechanisms can aid in galvanising support and trust from the wider public who are more likely to buy into a decision that is delivered by ordinary people, like themselves.
- When affected groups are included in the decision-making process, they are less likely to object to the outcome, even if the result is not what they hoped for.

The case for a local-level approach to energy and climate action

A bottom-up, local-level approach is essential to meeting emissions reduction targets across all sectors. Local level climate and energy solutions identified using a bottom-up, local level approach represent an essential and under-developed aspect of Ireland's climate and energy governance,

funding, and policy framework. While a national policy and governance framework is in place, all climate and energy projects take place within a local context.

Best-in-class European examples of this type of approach (6), have been shown many times to be highly effective at delivering projects, solutions and engagement. This trajectory in EU policy can also be seen in the latest proposal for a recast Energy Efficiency Directive - member states must:

- Encourage regional and local authorities to prepare local heating and cooling plans in municipalities with a total population greater than 35,000.
- Support involvement of local stakeholders and participation of the general public.
- Consider the needs of local communities.

A critical aspect of the success of this bottom-up, local-level approach is that it finds local-level energy and climate action synergies and opportunities that do not typically emerge from national level planning. Importantly it also involves local stakeholders and the local public. This promotes climate engagement and climate literacy from the bottom-up, and gives local organisations, businesses, and the local public and communities a stake in this societal transition.

Local level education and engagement is shown to facilitate improved buy-in and acceptance of the changes required for this transition away from fossil fuels. While a majority of people may support climate policy, we know from on the ground project roll-out that when it directly impacts people, i.e. bike lanes on their driving route, or reduced car parking on their road, the support disappears when there is not meaningful engagement and information provided, and not just traditional tick-box consultations - what we don't need is any delays or back-lash against solutions that are essential to meeting the sectoral carbon budgets.

To further Ireland's climate ambition it is essential to identify the local-level, bottom-up energy and climate action initiatives that have already been shown to be successful, and critically are scalable across Ireland, fostering the multiplication and proliferation of climate solutions and bottom-up climate engagement across Ireland.

Rapid deployment of district heating is essential to keep Ireland within our sectoral emissions ceilings for buildings

The following actions can help accelerate the deployment of district heat:

Long term policy stability is a critical supporting measure to enable district heating to realise its potential as outlined in the SEAI National Heat Study, Irish District Energy Association's Heat Atlas, and Codema's Dublin Region Energy Masterplan. Codema propose a nationwide target of 54% - 57% of building heat demand to be met by district heating in 2050 based on the results of these national studies. This ambition will be a clear signal to the market that Ireland sees district heating as an essential part of the low-carbon energy transition, and not just for 'pilot' schemes.

Financial supports across key project elements:

- Pre-investment project development costs
- Heat supply infrastructure
- Network infrastructure
- Customer connection costs (i.e. heat exchanger)

- Capacity building and skills development to generate the require indigenous workforce

Evidence-based zoning for district heating should be introduced and requirements put in place for buildings in these areas in relation to connection:

- Zoning future-proofs demand and supply and helps de-risk the market
- Lower risk if customers and heat supply sources are 'DH ready', and public sector anchors must connect
- Ensuring buildings are future-proofed for DH lowers retrofit costs
- Ensuring sufficient road space allocated de-risks trenching
- Ensures multiple solutions not rolled out in same place (i.e. gas grids and DH grids)

A requirement for local area spatial energy planning or heat planning

In the most recent proposals for the Energy Efficiency Directive approved by the European Parliament in July 2022, Article 23 would require regional and local authorities to prepare local heating and cooling plans in municipalities with a total population greater than 35,000 and encourage municipalities with a lower population to prepare such plans. When introduced in Ireland this initiative will support identification of the potential for district heat from both a heat demand side and a heat supply side (including waste heat availability). A similar requirement has been in place in countries such as Denmark for years and has been adopted by even more regions in recent times. The German province of Baden-Württemberg has recently required that all towns and cities of 20,000 inhabitants or more are required to carry out heat planning in order to decarbonise heating by 2050.

Introduction of customer protection for district heating

Support capacity building across the supply chain for both DH and heat pumps (planning, construction & installation, design, finance, legal, policy and regulation, etc.)

Avoidance of support for use of decarbonised gases for space heating as highlighted in the SEAI National Heat Study.

Rapid uptake of active travel is essential to keep Ireland within our sectoral emissions ceilings for transport

Electrification of transport is necessary but not sufficient to meet our energy and emissions targets. Assuming electric vehicle targets in the Climate Action Plan 2021 are met Codema's Dublin Region Energy Masterplan has shown that in the case of Dublin, to achieve a 51% reduction by 2030 will additionally require a minimum 23% reduction in the distance travelled by fossil-fueled cars in Dublin.

Active travel is the simplest, quickest and most cost-effective way to decarbonise urban mobility, particularly for shorter journeys. E-bikes can significantly increase the range over which active travel is possible, and are now the fastest growing form of electric mobility in Europe.

Reducing car dependency and enabling a shift to active travel and public transport, is essential for this sector, followed by the electrification of a reduced car fleet.

Additional powers are required to allow local authorities to reallocate public space to more sustainable modes and to implement low-traffic neighbourhoods or filtered permeability schemes. Reallocating public space away from motor traffic can also provide additional safe space for nature, for people to socialise and for children to play. Legislation to provide for experimental road traffic orders, allowing for trials of 6-18 months, should be enacted.

EV charging infrastructure needs to be provided in a way that does not prioritise private cars over active travel or public transport users

Publication of fossil fuel boiler phase out dates

According to the SEAI National Heat Study, phase out dates for use of fossil fuel boilers must be in the 2026 - 2035 time range to allow us to meet decarbonisation targets.

Additionally, the most cost-effective, and lowest cumulative emission pathways for decarbonisation of the heat sector involve significant scaling back of the gas distribution network serving the residential, commercial, and public sectors on the path to 2050. Consequently, decommissioning of the fossil gas distribution network serving these sectors should also be planned, beginning in this time frame.

(1) <https://www.codema.ie/projects/local-projects/dublin-region-energy-master-plan/>

(2) <https://www.codema.ie/projects/european-projects/deliverree>

(3) <https://www.codema.ie/think-energy-home-hub/the-home-energy-saving-kit>

(4) <https://sites.google.com/codema.ie/zero-together/home?authuser=0>

(5) Haf, S. and Robinson, R., 2020. How Local Authorities can encourage citizen participation in energy transitions.

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Ferejohn, J., 2008. Conclusion: the Citizens' Assembly model.

Fung, A., 2006. Varieties of Participation in Complex Governance.

McCabe, S., 2020. The People's Transition: Community-led Development for Climate Justice.

OECD (2020), Innovative Citizen Participation and New Democratic Institutions: Catching the Deliberative Wave

Sanoff, H., 2000. Community Participation Methods in Design and Planning.

(6) <https://municipalpower.org/best-practice-guides/> ; <https://roadmap-en.leuven2030.be/introduction>

Q5: What do you view as the main challenges/obstacles to the Sectoral Emission Ceilings being met?

Codema:

Key challenges to meeting the Sectoral Emissions ceilings include:

Under-utilisation of a local level approach to climate action.

Without a bottom-up local-level approach:

Local-level energy and climate action synergies and opportunities are not visible and not identified, as these do not typically emerge from national level planning.

There is a missed opportunity to promote climate engagement and climate literacy from the bottom-up, giving local organisations, businesses, and the local public and communities a stake in this societal transition.

Local support for climate action can disappear when there is not meaningful engagement and information provided, and not just traditional tick-box consultations. Without this engagement there is a risk of delays or backlash against solutions that are essential to meeting the sectoral carbon budgets.

As discussed in 'Sectoral Emissions Ceiling Q1', scalable local-level solutions to this challenge include:

Spatial energy planning is a powerful tool - it includes local level energy supply and demand analyses and emissions analyses that can identify opportunities and synergies not visible at a national level. An example of local-level synergies and opportunities, is district heat scheme viability, or sector integration opportunities. Codema's Dublin Region Energy Masterplan (1) is a recent example of this type of work, and one that could be replicated across Ireland. It provides realistic, evidence-based pathways for the Dublin Region to achieve its carbon emission reduction targets to 2030 and 2050, on a spatial basis, allowing for geographically based energy planning.

Local level awareness and engagement, such as:

Codema's award winning Home Energy Savings Kits (2), an effective community based initiative. A year-long study by SEAI and Codema in 2018 of 250 users of the kits found that 86% of respondents said that the kit made them think about how they use energy in their homes. Sixty per cent of respondents also cited that the kit triggered an intention to act in terms of home upgrades and 71% wanted further engagement (e.g. in terms of events, workshops, etc.) showing a desire by the majority of people using the kit to increase their level of energy awareness even further. Additionally, 97% said that they would recommend the kit to someone else.

SEAI Sustainable Energy Communities (SECs). Codema is the regional coordinator for the Mid-East region for the SEC programme, which currently consists of 164 communities. This is an excellent programme with significant potential, however there are some barriers to reaching its full potential:

- Need for improved access to technical expertise for SECs - this could be facilitated by additional training for local ambassadors. Associated with this there is potential for improvements to the energy master plan process.
- Cost, affordability, and project risk challenges.

- There is space for enhanced local engagement to recruit more community support into the SEC programme, to help scale and build further capacity.
- There is a need for more support in the 'Do' phase of the 'Learn, Plan, Do' framework. An avenue for providing more support could be to create a structured process that supports SECs to engage with 'One-Stop-Shops'. Codema sees large potential in this scheme for both community engagement and delivery of retrofit targets, if SECs are used as an aggregator to bundle projects for one-stop-shops.

Delivery of district heating networks. Supporting actions include:

Long term policy stability is a critical supporting measure to enable district heating to realise its potential as outlined in the SEAI National Heat Study, Irish District Energy Association's Heat Atlas, and Codema's Dublin Region Energy Masterplan. Codema propose a nationwide target of 54% - 57% of building heat demand to be met by district heating in 2050 based on the results of these national studies. This ambition will be a clear signal to the market that Ireland sees district heating as an essential part of the low-carbon energy transition, and not just for 'pilot' schemes.

Financial supports across key project elements:

- Pre-investment project development costs
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In the most recent proposals for the Energy Efficiency Directive approved by the European Parliament in July 2022, Article 23 would require regional and local authorities to prepare local heating and cooling plans in municipalities with a total population greater than 35,000 and encourage municipalities with a lower population to prepare such plans. When introduced in Ireland this initiative will support identification of the potential for district heat from both a heat demand side and a heat supply side (including waste heat availability). A similar requirement has been in place in countries such as Denmark for years and has been adopted by even more regions in recent times. The German province of Baden-Württemberg has recently required that all towns and cities of 20,000 inhabitants or more are required to carry out heat planning in order to decarbonise heating by 2050.

Introduction of customer protection for district heating

Support capacity building across the supply chain for both DH and heat pumps (planning, construction & installation, design, finance, legal, policy and regulation, etc.)

Avoidance of support for use of decarbonised gases for space heating as highlighted in the SEAI National Heat Study.

Local approach to active travel

Electrification of transport is necessary but not sufficient to meet our energy and emissions targets. Assuming electric vehicle targets in the Climate Action Plan 2021 are met Codema's Dublin Region Energy Masterplan has shown that in the case of Dublin, to achieve a 51% reduction by 2030 will additionally require a minimum 23% reduction in the distance travelled by fossil-fuelled cars in Dublin.

Active travel is the simplest, quickest and most cost-effective way to decarbonise urban mobility, particularly for shorter journeys. E-bikes can significantly increase the range over which active travel is possible, and are now the fastest growing form of electric mobility in Europe.

Reducing car dependency and enabling a shift to active travel and public transport, is essential for this sector, followed by the electrification of a reduced car fleet.

Additional powers are required to allow local authorities to reallocate public space to more sustainable modes and to implement low-traffic neighbourhoods or filtered permeability schemes. Reallocating public space away from motor traffic can also provide additional safe space for nature, for people to socialise and for children to play. Legislation to provide for experimental road traffic orders, allowing for trials of 6-18 months, should be enacted.

EV charging infrastructure needs to be provided in a way that does not prioritise private cars over active travel or public transport users

Need for more mechanisms to increase energy efficiency and renewable energy project delivery rate in commercial and public sectors

An aggregated energy performance contract based project delivery system to accelerate delivery of energy projects for the commercial and public sector. Codema's DeliverEE project (3) is an effective example of a 'one-stop-shop' project implementation unit that could be a model for scaling around Ireland.

DeliverEE will accelerate the formation of large-scale projects by standardising the project development process, allowing projects of various types and sizes to be aggregated together to create viability and scale.

Aggregation and scaling enables the use of energy performance and energy supply contracts whose performance guarantees are both critical for achieving value for money and provide a mechanism for the involvement of private capital.

The client does not need to provide 100% up-front funding, and the performance risk is placed on the Energy Services Contractor (ESCO), as the technical expert.

A key part of the programme is creation of an innovative, standardised finance and delivery system for rolling out energy-efficiency and renewable energy projects, at mass scale, and bundled together to gain large-scale impact.

Need for enhanced 'social licence to operate' for delivery of climate projects and infrastructure

Without a 'social licence to operate':

Local-level stakeholders and the local public are significantly less likely to be engaged. This often presents challenges to achieving social consensus and consequently to successful and timely project delivery - presenting further obstacles to the solutions that will help us reach our carbon budgets.

Local-level barriers and solutions in moving away from fossil fuels are less likely to have been identified and included in decarbonisation plans. A one-size-fits all process is ill-equipped to address local needs or be reflective of the experience of those living in a particular area.

Local support for climate action can disappear. Without meaningful engagement and information provided (going beyond traditional consultations) there is a risk of delays or backlash against solutions that are essential to meeting the sectoral carbon budgets.

As discussed in 'Sectoral Emissions Ceiling Q1', scalable solutions to this challenge include:

Evidence-based, holistic and democratic regional roadmap approaches such as Codema's Zero Together initiative (4).

Zero Together:

Brings together a comprehensive evidence base, community engagement, and multi-sectoral engagement across public, commercial, industrial and academic sectors, acting as a catalyst and multiplier of climate action across these sectors.

Will chart a collaborative, societally supported pathway to net-zero emissions, rooted in science, but with a social licence via its engagement mechanisms.

Sets a vision of Dublin as a climate friendly, clean, healthy and inclusive county, and will create a plan to address the 95% of emissions in Dublin not directly managed by the public sector.

Core elements include:

Creation of a cross-sector roadmap to net-zero for Dublin.

Creation of a 'Transition Team' to support management of the net-zero roadmap with cross-sectoral engagement.

A plan for a regional level version of a citizen's assembly on climate and energy based in Dublin, known as a mini-public or citizen's jury.

Evidence shows (5):

The need for and effectiveness of bottom-up public engagement, such as a citizen's jury, to complement traditional top-down participatory models. Deliberative processes, when implemented properly, "can lead to better policy outcomes, enable policy makers to make hard choices and enhance trust between citizens and government".

Representative deliberative mechanisms can aid in galvanising support and trust from the wider public who are more likely to buy into a decision that is delivered by ordinary people, like themselves

When affected groups are included in the decision-making process, they are less likely to object to the outcome, even if the result is not what they hoped for.

There is currently no fossil fuel boiler phase out date

According to the SEAI National Heat Study, phase out dates for use of fossil fuel boilers must be in the 2026 - 2035 time range to allow us to meet decarbonisation targets.

Additionally, the most cost-effective, and lowest cumulative emission pathways for decarbonisation of the heat sector involve significant scaling back of the gas distribution network serving the residential, commercial, and public sectors on the path to 2050. Consequently, decommissioning of the fossil gas distribution network serving these sectors should also be planned, beginning in this time frame.

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Carbon Pricing & Cross-Cutting Policies

Q6: Are there any unintended barriers within the planning system that should be addressed at national policy level in order to deliver our climate ambitions?

Codema:

Barriers within the planning system to effective climate action include:

Under-utilisation of a local level approach to energy planning. Solutions include:

Spatial energy planning is a powerful tool - it includes local level energy supply and demand analyses and emissions analyses that can identify opportunities and synergies not visible at a national level. An example of local-level synergies and opportunities, is district heat scheme viability, or sector integration opportunities. Codema's Dublin Region Energy Masterplan is a recent example of this

type of work, and one that could be replicated across Ireland. It provides realistic, evidence-based pathways for the Dublin Region to achieve its carbon emission reduction targets to 2030 and 2050, on a spatial basis, allowing for geographically based energy planning.

This approach is coming also from a European perspective - In the most recent proposals for the Energy Efficiency Directive approved by the European Parliament in July 2022, Article 23 would require regional and local authorities to prepare local heating and cooling plans in municipalities with a total population greater than 35,000 and encourage municipalities with a lower population to prepare such plans. When introduced in Ireland this initiative will support identification of the potential for district heat from both a heat demand side and a heat supply side (including waste heat availability).

Consideration of emissions impact of planning applications. Building energy efficiency is managed through current building regulations, however in large commercial and industrial developments there can still be significant fossil fuel use from planned on-site equipment or on-site energy generation which is not always considered at planning stages. Updated planning regulations are required to ensure applications with a high usage of fossil fuels and high emissions impact are not granted planning permission. Energy planners should be a core part of the Local Authority planning teams, like in other EU countries.

Relevant data should be made openly available for the purpose of energy planning. The current implementation of the EPBD into Irish legislation (SI No. 243/2012) only allows BER/EPC (Building Energy Rating/Energy Performance Certificate) assessors access BER/EPC data. This makes it difficult even for policymakers to process BER/EPC data. All BER data, and accompanying reports should be open. This data is not sensitive but its value for research, energy planning & policy is large. The UK has made its BER/EPC data open access, allowing anyone to link BER/EPC data for any home in the UK with other data sets (1). This allows researchers, policymakers, & utilities to develop effective energy efficiency programs, increasing value for money. Spain recently made its EPC data open access, allowing the relationship between EPC rating and consumers' ability to repay loans to be understood. This leads to increased lending for retrofit projects. It is also very important that real meter data (elec, heat, gas, comfort) be linked with EPC data in order to fully assess the real impact of retrofitting works & account for real world plant efficiencies rather than lab tested efficiencies. The EPBD concerted action group have also been discussing the idea of basing future EPC's/BER's on metered energy use and to have them as "live living documents fed with fresh meter data overtime". This approach would increase their value greatly. Further recommendations here on making EPC data more open access: (<https://www.mdpi.com/1996-1073/12/10/2029/pdf>). It is also important that this data is available at the highest possible granularity spatially i.e. that individual building locations and associated data is made available to trusted research organisations to ensure the highest quality of energy planning.

Lack of structured support for district heating in local planning. Solutions include:

Evidence-based zoning for district heating should be introduced and requirements put in place for buildings in these areas in relation to connection:

- Zoning future-proofs demand and supply and helps de-risk the market
- Lower risk if customers and heat supply sources are 'DH ready', and public sector anchors must connect

- Ensuring buildings are future-proofed for DH lowers retrofit costs
- Ensuring sufficient road space allocated derisks trenching
- Ensures multiple solutions not rolled out in same place (i.e. gas grids and DH grids)

(1) <https://epc.opendatacommunities.org/>"

Q7: What further opportunities exist within our taxation system, beyond measures already implemented and planned, to promote emissions reductions, either on an economy-wide basis, or in specific sectors?

[REDACTED] Codema:

The relative price of electricity to gas or oil (commonly referred to as the spark gap) in Ireland is amongst the highest in Europe. This difference in prices has proven to be a barrier to the electrification of heat (through heat pump adoption) in Ireland and made Ireland the worst performing country in Europe in relation to the proportion of heat which comes from renewable sources (currently at 6.3% of total heat demand). One of the contributing factors to this large spark gap is the relatively high taxes applied to electricity in comparison to gas. One option to address this imbalance is to reduce the levies on electricity used for heating via heat pumps. This is discussed in greater detail in report published by the Regulatory Assistance Project (1).

(1) <https://www.raonline.org/knowledge-center/aligning-heating-energy-taxes-levies-europe-climate-goals/>

Q9: Are there any significant cross-cutting gaps not previously discussed in Climate Action Plan 21 that need to be addressed?

[REDACTED] Codema:

There is currently no fossil fuel boiler phase out date

According to the SEAI National Heat Study, phase out dates for use of fossil fuel boilers must be in the 2026 - 2035 time range to allow us to meet decarbonisation targets.

Additionally, the most cost-effective, and lowest cumulative emission pathways for decarbonisation of the heat sector involve significant scaling back of the gas distribution network serving the residential, commercial, and public sectors on the path to 2050. Consequently, decommissioning of the fossil gas distribution network serving these sectors should also be planned, beginning in this time frame.

Bottom-up local-level community engagement is required in addition to top-down participatory mechanisms

A scalable example is Codema's Zero Together initiative (1) - an evidence-based, holistic and democratic regional roadmap approach.

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Brings together a comprehensive evidence base, community engagement, and multi-sectoral engagement across public, commercial, industrial and academic sectors, acting as a catalyst and multiplier of climate action across these sectors.

Will chart a collaborative, societally supported pathway to net-zero emissions, rooted in science, but with a social licence via its engagement mechanisms.

Sets a vision of Dublin as a climate friendly, clean, healthy and inclusive county, and will create a plan to address the 95% of emissions in Dublin not directly managed by the public sector.

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Creation of a cross-sector roadmap to net-zero for Dublin.

Creation of a 'Transition Team' to support management of the net-zero roadmap with cross-sectoral engagement.

A plan for a regional level version of a citizen's assembly on climate and energy based in Dublin, known as a mini-public or citizen's jury.

Evidence shows (2):

The need for and effectiveness of bottom-up public engagement, such as a citizen's jury, to complement traditional top-down participatory models. Deliberative processes, when implemented properly, "can lead to better policy outcomes, enable policy makers to make hard choices and enhance trust between citizens and government".

Representative deliberative mechanisms can aid in galvanising support and trust from the wider public who are more likely to buy into a decision that is delivered by ordinary people, like themselves

When affected groups are included in the decision-making process, they are less likely to object to the outcome, even if the result is not what they hoped for.

(1) <https://sites.google.com/codema.ie/zero-together/home?authuser=0>

(2) Haf, S. and Robinson, R., 2020. How Local Authorities can encourage citizen participation in energy transitions.

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Public Sector

Q73: What opportunities exist for the public sector to step up its climate ambition?

Codema:

The public sector has a significant opportunity to play a leading role in meeting Ireland's district heat targets. Demand uncertainty is a large barrier to district heating deployment - the public sector can reduce demand uncertainty by leading the transition to district heat by acting as 'anchor loads' - the first customers of new district heat networks, who by committing first ensure the scheme viability for subsequent residential and commercial connections.

The public sector has the opportunity to become early supporters of an effective, scalable, energy-efficiency and renewable energy project delivery aggregator

An aggregated energy performance contract based project delivery system can accelerate delivery of energy projects for the commercial and public sector. Codema's DeliverEE project (1) is an effective example of a 'one-stop-shop- project implementation unit that could be a model for scaling around Ireland.

DeliverEE will accelerate the formation of large-scale projects by standardising the project development process, allowing projects of various types and sizes to be aggregated together to create viability and scale.


Aggregation and scaling enables the use of energy performance and energy supply contracts whose performance guarantees are both critical for achieving value for money and provide a mechanism for the involvement of private capital.

The client does not need to provide 100% up-front funding, and the performance risk is placed on the Energy Services Contractor (ESCo), as the technical expert.

A key part of the programme is creation of an innovative, standardised finance and delivery system for rolling out energy-efficiency and renewable energy projects, at mass scale, and bundled together to gain large-scale impact.

(1) <https://www.codema.ie/projects/european-projects/deliveree>

Q74: What sort of practical changes would you expect the public sector to make in leading and delivering Ireland's climate ambition?

 Codema:

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(1) <https://www.codema.ie/projects/european-projects/delivereee>

Q75: How can the public sector lead wider society to change? In the short-term, medium-term, long-term?

 Codema:

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(1) <https://www.codema.ie/projects/european-projects/deliveee>

Enterprise, Waste & Circular Economy


Q21: What measures can be taken to decarbonise high temperature heating in industry?

 Codema:

The relative price of electricity to gas or oil (commonly referred to as the spark gap) in Ireland is amongst the highest in Europe. This difference in prices has proven to be a barrier to the electrification of heat (through heat pump adoption) in Ireland and made Ireland the worst performing country in Europe in relation to the proportion of heat which comes from renewable sources (currently at 6.3% of total heat demand). One of the contributing factors to this large spark gap is the relatively high taxes applied to electricity in comparison to gas. One option to address this imbalance is to reduce the levies on electricity used for heating via heat pumps. This is discussed in greater detail in report published by the Regulatory Assistance Project (1).

(1) <https://www.raponline.org/knowledge-center/aligning-heating-energy-taxes-levies-europe-climate-goals/>

Q23: How can we encourage the diversification away from products with high levels of embodied carbon, such as traditional cement in construction to lower carbon alternatives?

 Codema:

Measurement and evaluation of embodied and operational carbon impact for all construction, renovation and infrastructure is a potentially effective measure. This will be of great benefit if embodied carbon assessment is included in planning processes, that will help to clearly identify which zones and developments should be prioritised.

Having clear guidelines and methodologies on how to assess embodied emissions of different renewable and low carbon technologies, would also add an additional layer of information, which would help prioritise low carbon technologies (e.g., do individual heat pumps have less or more embodied carbon than district heating).

It would also be of benefit to have an embodied carbon inventory (similar to the Environmental Product Declarations) of all renewable and low carbon technologies, as this would allow consultants to assist policy makers to identify which technologies should be prioritised. This inventory should also consider the lifespan of specific technologies, for example, certain technologies will have a lifespan that is shorter than the life of the building (for example heat pumps or solar PV) whilst others (such as district heating) will have a longer lifespan than the building itself. Thus, this lifespan and the future embodied emissions created due to the need to replace the technology (if needed) should also be accounted for.

It should also be noted that the Chartered Institution of Building Services Engineers (CIBSE) have also published an embodied carbon methodology for building services, that might link in well with this roadmap. CIBSE TM65 Embodied carbon in building services: calculation methodology (2021) outlines the methodology for calculating embodied emissions in building services. It also highlights the need for assessments of embodied carbon of products, to help increase knowledge and facilitate research in whole life carbon in building services. It covers the whole life cycle, excluding operational aspects and the potential recovery, reuse or recycling of materials. The embodied carbon associated with building service design can be significant in a building lifetime due to the materials that service equipment are made of and high replacement rates, and CIBSE has also created a tool to help quantify emissions from embodied carbon (Embodied Carbon Calculator) (1).

(1) <https://www.cibse.org/knowledge-research/knowledge-portal/embodied-carbon-calculator-tm65-digital-tool>

Q25: What other opportunities exist to drive the decarbonisation of the enterprise sector?

Codema:

Setting phase out dates for fossil fuel boilers.

According to the SEAI National Heat Study, phase out dates for use of fossil fuel boilers must be in the 2026 - 2035 time range to allow us to meet decarbonisation targets.

Additionally, the most cost-effective, and lowest cumulative emission pathways for decarbonisation of the heat sector involve significant scaling back of the gas distribution network serving the residential, commercial, and public sectors on the path to 2050. Consequently, decommissioning of the fossil gas distribution network serving these sectors should also be planned, beginning in this time frame.

Bottom-up local-level community engagement is required in addition to top-down participatory mechanisms

A scalable example is Codema's Zero Together initiative (1) - an evidence-based, holistic and democratic regional roadmap approach. Zero Together:

Brings together a comprehensive evidence base, community engagement, and multi-sectoral engagement across public, commercial, industrial and academic sectors, acting as a catalyst and multiplier of climate action across these sectors.

Will chart a collaborative, societally supported pathway to net-zero emissions, rooted in science, but with a social licence via its engagement mechanisms.

Sets a vision of Dublin as a climate friendly, clean, healthy and inclusive county, and will create a plan to address the 95% of emissions in Dublin not directly managed by the public sector.

Core elements include:

Creation of a cross-sector roadmap to net-zero for Dublin.

Creation of a 'Transition Team' to support management of the net-zero roadmap with cross-sectoral engagement.

A plan for a regional level version of a citizen's assembly on climate and energy based in Dublin, known as a mini-public or citizen's jury.

Evidence shows:

The need for and effectiveness of bottom-up public engagement, such as a citizen's jury, to complement traditional top-down participatory models. Deliberative processes, when implemented properly, "can lead to better policy outcomes, enable policy makers to make hard choices and enhance trust between citizens and government".

Representative deliberative mechanisms can aid in galvanising support and trust from the wider public who are more likely to buy into a decision that is delivered by ordinary people, like themselves

When affected groups are included in the decision-making process, they are less likely to object to the outcome, even if the result is not what they hoped for.

Carbon reporting for the enterprise sector. Related sustainability reporting is likely to be required in Ireland later this decade according to the EU Proposal for a Corporate Sustainability Reporting Directive (CSRD) (2).

(1) <https://sites.google.com/codema.ie/zero-together/home?authuser=0>

(2) https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

Q72: What other opportunities exist to support decarbonisation through the acceleration of a transition to the circular economy?

 Codema:

Ireland has a significant waste heat opportunity

Heat sources that arise as a by-product of electricity generation, industrial activity, the natural environment or from existing infrastructure are low or zero-carbon and often go to waste. Codema estimates that there is almost 3,500 MW of waste heat in Dublin from these sources (including both low-grade and high-grade heat), equating to 24,244 GWh of wasted heat per annum. These sources could reduce the total fossil fuel bill for Dublin by €1.01 billion per year and reduce the region's exposure to price fluctuations and security of supply issues in the oil and gas markets.

The flexibility offered by district heating supply means it is possible to continually connect new secure local sources to the network. This also offers increased price stability and security for customers. The use of existing local heat sources can provide many advantages to a DH network, such as:

Increased security of supply

- Lower cost or free heat as it is already being lost to the environment – improving the economic case for the DH system
- Low or zero-carbon emissions as it is a by-product of a separate primary process – reducing emissions associated with heating
- Where heat pumps are being used, district heating networks can be used to balance the electricity grid and increase the proportion of renewable energy that can be utilised

The heat source map created by Codema (1) assesses 18 different heat source types in the county and utilises data from approximately 70 different sources. The heat sources that were assessed are listed below with more details on what they are and how they were quantified given in the Heat Source Description and Heat Source Assessment Methodology sections in the appendices.

Commercial Sources:

- Flue gas heat recovery
- Industrial process heat recovery
- Commercial CHP excess heat
- Excess heat from existing biomass installations
- Commercial building cooling system waste heat (e.g. data centres, cold storage facilities)

Infrastructural Sources:

- Power plant waste heat (EfW and conventional power stations)
- Electrical transformer waste heat
- Landfill waste heat
- Landfill biogas
- WWTW waste heat
- WWTW biogas/sludge incineration
- Sewage pipe waste heat

Environmental Sources:

- Air-source heat pumps
- Surface water (rivers, lakes, canals)
- Seawater
- Ground source heat pumps (shallow)
- Deep geothermal
- Mine water

(1) pg. 71 - <https://www.codema.ie/projects/local-projects/dublin-region-energy-master-plan/>

Electricity

Q11: What options are available to increase the penetration of renewable electricity beyond the up to 80% committed to in Climate Action Plan 2023?

 Codema:

Thermal storage associated with the large-scale deployment of district heat over the next decade and beyond has significant potential to provide flexibility services to the electricity system.

Particular benefits of district heating to the electricity system include:

Greater utilisation of renewable electricity (e.g., curtailment of wind turbines can be reduced) due to the flexibility provided by district heat with thermal storage capacity.

Thermal storage associated with district heating can provide flexibility, demand and frequency response services to the electricity grid at a fraction of the cost of battery storage when supplied by large-scale heat pumps, electric boilers etc.

Potential for reduced demands on the electricity system, in comparison to a counterfactual where heat pumps are installed in each building. District heat results in reduced grid upgrade costs due to higher efficiency of large-scale heat production particularly those which utilise waste heat and also due to these grid connections by-passing lower capacity grid infrastructure (individual building connections, mini-pillars, etc.) which would serve heat pumps located in individual buildings.

Easier integration of renewable and low-carbon heat sources without disruption to customers/homeowners as access to each individual dwelling is not required.

Potential to explore cost savings from shared trenching costs through dense urban areas for any grid upgrades that are concurrent with the expansion of the district heating networks.

Further research and demonstration projects and partnerships are required to further explore and demonstrate this potential.

Q12: What can be done to accelerate/facilitate the delivery/deployment of offshore wind and solar PV in particular, in the context of Climate Action Plan 2021 and the REPowerEU ambition?

 Codema:

For residential solar PV, the simple NC6 micro-generation connection process, the new micro-generation support scheme and proposed new planning exemptions will greatly assist uptake.

However, for larger, non-domestic projects above 6/11 kVA, securing a grid connection is still a major difficulty for SMEs, public buildings and community energy projects. If scaled-up, the new Mini-Generation Pilot Scheme for projects up to 50 kVA has the potential to allow for connection of significant quantities of renewable power to the grid.

However, by limiting the number of new applications to just 500, this will restrict the amount of renewable generation connected, presumably consisting mostly of solar PV, to approximately 25 MW. To maximise benefit this pilot scheme could be expanded and made permanent.

For larger projects of up to 500 kW, an export connection must be applied for under Category B of the ECP-2 process. Only 15 connections are offered through this process each year, which creates huge constraints on the numbers of projects of this scale being developed. Similarly, only a further 15 connection offers per year are available under Category C of the ECP-2 process for larger community projects in the range of 500 kW to 5 MW. A scaling up of the ECP-2 connection process will be required in order to enable a significant increase in the number of small projects being offered connections under Category B and Category C. This scaling-up should align with the proposed new Small-Scale Generation Support Scheme for projects of this scale.

Q15: What other opportunities exist to support the decarbonisation of the electricity sector?

[REDACTED] Codema:

Current private-wire regulations are restricting the development of small-scale generation projects, and in particular community projects. By revising these regulations to allow for direct wire connections between generators and consumers, this could allow for significantly increased numbers of these smaller projects, and boost the acceptance of renewables among these communities. At a larger scale, direct-wire PPAs could play a role in reducing the impact of large energy users on the national grid network. A review of these regulations was set out as an action in the 2021 Climate action Plan, but has yet to be completed.

Q17: What role do you see for electricity storage and demand-side response in providing flexibility to a system comprised of high renewable penetration and in supporting the decarbonisation of the electricity sector?

[REDACTED] Codema:

Thermal storage associated with the large-scale deployment of district heat over the next decade and beyond has significant potential to provide flexibility services to the electricity system. Particular benefits of district heating to the electricity system include:

Greater utilisation of renewable electricity (e.g., curtailment of wind turbines can be reduced) due to the flexibility provided by district heat with thermal storage capacity.

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Further research and demonstration projects and partnerships are required to further explore and demonstrate this potential.

Transport

Q42: What Obstacles exist in the planning system that may prevent greater modal shift from being achieved? Are there specific measures that can be implemented to avoid further forced car dependency or lock-in of unsustainable practices?

Codema:

Additional powers are required to allow local authorities to reallocate public space to more sustainable modes such as active travel and to implement low-traffic neighbourhoods or filtered permeability schemes. Reallocating public space away from motor traffic can provide additional safe space for nature, for people to socialise and for children to play, while also reducing noise and air pollution.

Legislation to provide for experimental road traffic orders, allowing for trials of 6-18 months, should be enacted. Before and after analysis of the impacts on traffic volumes, vehicle speeds, user experience and other key indicators should be considered as part of such schemes.

Q43: What changes should be considered in relation to the management of Ireland's road network (e.g. reducing speed limits, parking policy, road user/congestion charging) to reduce congestion and support the prioritisation of more sustainable modes?

[REDACTED] Codema:

All new road building or capacity increase projects should be put on hold pending the result of independent, externally conducted analysis on whether the project aligns fully with our challenging transport-related climate policies and targets, and whether it would result in increased GHG emissions. Such a freeze on road projects has recently been introduced in Wales, with a Roads Review Panel set up to assess the impact of the project under a number of key headings (1). The review panel comprises experts in the fields of transport planning and climate change, freight logistics, highway engineering and public engagement. A panel engaged under similar terms of reference could be set up in Ireland, making recommendations on whether each project should be supported, supported with modifications, or not supported.

A default 30 km/h speed limit in urban areas should be mandated across all local authorities. In February 2020, the then Minister for Transport, Shane Ross, signed the Stockholm Declaration which signed up to 'mandate a maximum road travel speed of 30 km/h in areas where vulnerable road users and vehicles mix in a frequent and planned manner, except where strong evidence exists that higher speeds are safe.' This would have a huge effect on road safety and encourage many more people to use active travel, and would bring Ireland in line with most other European countries where such policies are already in place. This policy is strongly supported by the road safety Authority, and is specifically included under High Impact Action (Number 6) in their Road Safety Strategy 2021-2030. The success of this policy, however, will depend upon re-engineering of existing roads to limit speeds, as well as targeted enforcement, including through the use of ANPR technology.

Outside of urban areas, a significant downward revision of rural speed limits is required, particularly on Local roads. The current default speed limit of 80 km/h on Regional and Local roads is inappropriately high, and often makes it extremely unsafe for people walking, cycling or indeed motoring along these rural routes. The setting of speed limits needs to consider the safety of all road users, and not just of those behind the wheel of a car. The Guidelines for Setting and Managing Speed Limits in Ireland, last updated by the Department of Transport, Tourism and Sport in 2015, requires a complete rewrite to take into account the safety of active travel users and to remove the bias towards maintaining the speed of motor traffic.

(1) <https://gov.wales/wales-roads-review-initial-panel-report-html>

Q44: What additional measures should be considered to improve the quality or attractiveness of active mobility solutions as an alternative to private car use (e.g. dedicated lanes, secure bike parking, rest areas).

[REDACTED] Codema:

Additional powers are required to allow local authorities to reallocate public space to more sustainable modes such as active travel and to implement low-traffic neighbourhoods or filtered permeability schemes. Reallocating public space away from motor traffic can also provide additional safe space for nature, for people to socialise and for children to play. Legislation to provide for experimental road traffic orders, allowing for trials of 6-18 months, should be enacted.

The spending of billions of Euro on bus corridors and active travel infrastructure will have been in vain if existing road traffic regulations are not enforced. Traffic wardens, fixed cameras and bus-mounted cameras using ANPR technology must be employed on a large scale to detect and fine motorists who create danger or delays to active travel and public transport users. A web portal allowing members of the public to upload footage of dangerous and/or illegal road user behaviour to An Garda Síochána must also be developed without delay.

Q45: What policies or measures can be considered to further incentivise the use of more sustainable modes of transport for education and leisure-related journeys?

[REDACTED] Codema:

School streets should be implemented outside all schools in the country in order to ensure that students can safely access the school on foot or by cycling. This could extend to ensure that footpaths are provided on all roads leading to the school within a 2km radius for example.

Q47: Is the level of transformation required of our transport behaviour patterns well understood and what more can be done to demonstrate the benefits of modal shift? How can the overall impact of wider decarbonisation measures be measured most effectively (e.g. capturing wellbeing impacts, health impacts, liveability, permeability, etc.)?

 Codema:

More work is needed to create a shared societal understanding of the change required in our collective transport behaviour patterns. There is an existing perception that by simply replacing our existing car fleet with electric cars that we will be able to continue on business-as-usual. Codema's Dublin Region Energy Masterplan (1) found that even if we meet the ambitious EV targets set out in the Government's Climate action Plan, we would still need to reduce the total distance travelled by fossil-fuelled vehicles by at least 23% by 2030.

(1) <https://www.codema.ie/projects/local-projects/dublin-region-energy-master-plan/>

Built Environment

Q31: How can we ensure that necessary skills will be available to support district heating projects?

[REDACTED] Codema:

In countries such as Germany Centres of Excellence (CoE) have been created to support the roll out of DH. These are set at a national and regional level. The role of the national level CoE is to: set the agenda, provide funding and develop policy to support the more local CoE.

Q32: Housing for All Commits to 100% funding to retrofit 40% of local authority housing stock to B2 by 2030 at a cost of 1.4 billion euro. How can we further support local authorities to help them deliver on social housing retrofit targets?

[REDACTED] Codema:

Local authorities require additional staff for climate action delivery work, in line with their new and additional responsibilities in climate action. The additional local authority staff required to deliver the energy transition in Ireland has been estimated at 884 full-time employees by 2030 based on a report published by Energy Cities (1) (the European learning community for future-proofing cities).

(1) https://energy-cities.eu/wp-content/uploads/2022/06/EnergyCities_PolicyPaper_CapacityNeeds_EN_FINAL.pdf

Q33: In addition to the existing financial supports and policy measures, are there any other incentives/assistance needed to help homeowners upgrade the energy efficiency of their homes?

[REDACTED] Codema:

Current grants are significant but not accessible to a large portion of the population. Cost remains an important challenge for future policy supports.

As highlighted in the SEAI National Heat Study - policy needs to move beyond energy efficiency only in retrofits - 'Evolving existing policy supports to focus on replacing fossil fuels in buildings can have a more significant and immediate emissions reduction impact than a fabric-first approach'

Aggregation of homeowners through the SEAI Sustainable Energy Communities programme into one-stop-shops, to allow for economies of scale.

Q34: How could the roll-out of district heating be accelerated and what needs to be done to expand its coverage in Ireland?

Codema:

The following actions can help accelerate the deployment of district heat:

Long term policy stability is a critical supporting measure to enable district heating to realise its potential as outlined in the SEAI National Heat Study, Irish District Energy Association's Heat Atlas, and Codema's Dublin Region Energy Masterplan. Codema propose a nationwide target of 54% - 57% of building heat demand to be met by district heating in 2050 based on the results of these national studies. This ambition will be a clear signal to the market that Ireland sees district heating as an essential part of the low-carbon energy transition, and not just for 'pilot' schemes.

Financial supports across key project elements:

- Pre-investment project development costs
- Heat supply infrastructure
- Network infrastructure
- Customer connection costs (i.e. heat exchanger)

Evidence-based zoning for district heating should be introduced and requirements put in place for buildings in these areas in relation to connection:

- Zoning future-proofs demand and supply and helps de-risk the market
- Lower risk if customers and heat supply sources are 'DH ready', and public sector anchors must connect
- Ensuring buildings are future-proofed for DH lowers retrofit costs
- Ensuring sufficient road space allocated derisks trenching
- Ensures multiple solutions not rolled out in same place (i.e. gas grids and DH grids)

A requirement for local area spatial energy planning or heat planning

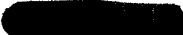
In the most recent proposals for the Energy Efficiency Directive approved by the European Parliament in July 2022, Article 23 would require regional and local authorities to prepare local heating and cooling plans in municipalities with a total population greater than 35,000 and encourage municipalities with a lower population to prepare such plans. When introduced in Ireland this initiative will support identification of the potential for district heat from both a heat demand side and a heat supply side (including waste heat availability).

Introduction of customer protection for district heating

Support capacity building across the supply chain for both DH and heat pumps (planning, construction & installation, design, finance, legal, policy and regulation, etc.)

Avoidance of support for use of decarbonised gases for space heating as highlighted in the SEAI National Heat Study.

Q35: Are there any specific obstacles in the planning system that is impeding the rollout of district heating and the national retrofit plan? How can we overcome these barriers?


 Codema:

Lack of structured support for district heating in local planning. Solutions include:

Evidence-based zoning for district heating should be introduced and requirements put in place for buildings in these areas in relation to connection:

- Zoning future-proofs demand and supply and helps de-risk the market
- Lower risk if customers and heat supply sources are 'DH ready', and public sector anchors must connect
- Ensuring buildings are future-proofed for DH lowers retrofit costs
- Ensuring sufficient road space allocated derisks trenching
- Ensures multiple solutions not rolled out in same place (i.e. gas grids and DH grids)

Q37: Further to the existing supports financed by carbon tax revenues, how can we protect those who are currently experiencing fuel poverty and those who are at risk?

 Codema:

Prioritising delivery of energy efficiency upgrades in areas that have been identified as being energy poor. Codema has conducted an analysis identifying these areas for Dublin (1, 2).

Aggregation of home energy upgrades using the Sustainable Energy Communities (SEC) network to enhance the delivery of energy efficiency measures and contribute to a reduction in energy poverty. This cross functional, and multidimensional approach, leverages the assets we already have embedded across Ireland, the Sustainable Energy Communities (SECs).

Regulatory solutions and new policy supports to address the challenge of split incentives in the rental sector.

Prioritise the delivery of low-carbon and renewable energy:

Wide-scale roll-out of district heating networks, including district heat zoning and financial support for district heat networks.

Research and review of Heat Loss Index (HLI) requirements for heat pump installations.

Continued delivery of renewable electricity and displacement of fossil fuels.

(1) <https://codema-dev.github.io/map/deprivation-index/>

(2) <https://www.codema.ie/projects/local-projects/dublin-region-energy-master-plan/>

Q38: What specific measures can be implemented to improve the efficiency of rolling out the National Retrofit Programme?

 Codema:

Create and support a national aggregation model of Sustainable Energy Communities.

This would allow individual homeowners, through the SEAI SEC programme, to aggregate together, and have access to lower retrofitting costs. This would make the roll out of the National Retrofit Programme:

More accessible to those who are struggling to afford the costs of deep retrofitting
More efficient in regards to time, and resource management, by completing a specified SEC area at once, rather than dealing with individual homeowners

Aggregation is key for ensuring the success and sustainability of the SEC programme, and with this new focus, will guide homeowners through a centralised process. This will allow One Stop Shop's to aggregate local contractors for specific SEC areas, providing local, trusted contractors in the communities they are already embedded in. There is also an opportunity to tie this into the Better Energy Communities programme. The National Retrofit Programme needs a cross functional strategy which pulls multiple programmes to achieve the results required to meet the ambitious targets.

The retrofitting targets can only be met with a cross functional approach, that utilises the assets we already have embedded across Ireland, the Sustainable Energy Communities. These communities contain groups of homeowners, who are educated and willing to transition their communities to a low carbon, energy efficient future. In order to achieve these targets, aggregation must be a part of the answer.

Q41: What is the next step for geothermal energy application to the built environment?

 Codema:

- There is significant potential for geothermal energy to contribute to the decarbonisation of heat energy in Ireland, and urgent research is required to better quantify the technical potential of both shallow and deep geothermal energy in Ireland to allow assessment of how it can contribute to Ireland's ambitious heat decarbonisation targets.
- District heat has been identified a key system for cost effectively decarbonising heat energy in Ireland, with potential to serve up to 50% of building heat demand in Ireland, and up to 87% of heat in Dublin, with a significant focus on district heat development in Ireland's Climate Action Plan 2021.
- Geothermal energy to power district heat needs urgent research drilling & data collection, to ascertain the technically viable heat resource, and associated techno-economic and business model

analysis to evaluate it in the context of other heat sources for district heat.

➤ Codema proposes that a pilot and demonstration project for geothermal-district heat is urgently funded and developed to allow feasibility assessment of this potentially important pathway. Codema additionally propose business model research for geothermal energy, and research into the inclusion of geothermal potential in local area spatial energy planning to facilitate awareness and planning capacity for delivery of future projects.

Research & Innovation

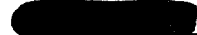
Q91: Are the required research and innovation programmes and structures in place to support our climate ambitions; including the provision of the evidence needed to underpin policy in a timely manner?

 Codema:

Many high quality research and innovation funding programmes are in place, however significant additional funding is needed to meet the scale of the climate challenge.

Additionally there is room for potential benefits in high level coordination between research programmes to ensure that similar research is not funded multiple times.

Q92: Have you identified any research and innovation gaps which need to be addressed? If so, how can these gaps best be addressed?

 Codema:

Research gaps in an Irish context include research to:

Develop and support spatial energy planning methodologies and tools.

Spatial energy planning is a powerful tool - it includes local level energy supply and demand analyses and emissions analyses that can identify opportunities and synergies not visible at a national level. It allows local authorities to create evidence-based policies and actions which affect CO2 emissions county-wide, by using the local authority's powers in spatial planning, land-use, planning policy and public infrastructure.

An example of local-level synergies and opportunities, is district heat scheme viability, or sector integration opportunities. Codema's Dublin Region Energy Masterplan (1) is a recent example of this type of work, and one that could be replicated across Ireland. It provides realistic, evidence-based pathways for the Dublin Region to achieve its carbon emission reduction targets to 2030 and 2050, on a spatial basis, allowing for geographically based energy planning.

Investigate potential for future development of district heating and cooling technologies, and wider energy system benefits of district heating and cooling such as flexibility services to the electricity grid using district heating and thermal storage.

Explore the potential opportunities for sector integration at a local level, building on the SEAI funded, Codema led Poolbeg sector integration project (2).

(1) <https://www.codema.ie/projects/local-projects/dublin-region-energy-master-plan/>

(2) <https://www.codema.ie/projects/local-projects/integration-of-heat-electricity-and-transport-use-of-curtailed-renewable-en>

Q93: Are there important areas of research and innovation, where Ireland currently does not have sufficient capability, that need to be developed? If so, what are these areas?

 Codema:

Research gaps in an Irish context include research to:

Develop and support spatial energy planning methodologies and tools.

Spatial energy planning is a powerful tool - it includes local level energy supply and demand analyses and emissions analyses that can identify opportunities and synergies not visible at a national level. It allows local authorities to create evidence-based policies and actions which affect CO2 emissions county-wide, by using the local authority's powers in spatial planning, land-use, planning policy and public infrastructure.

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