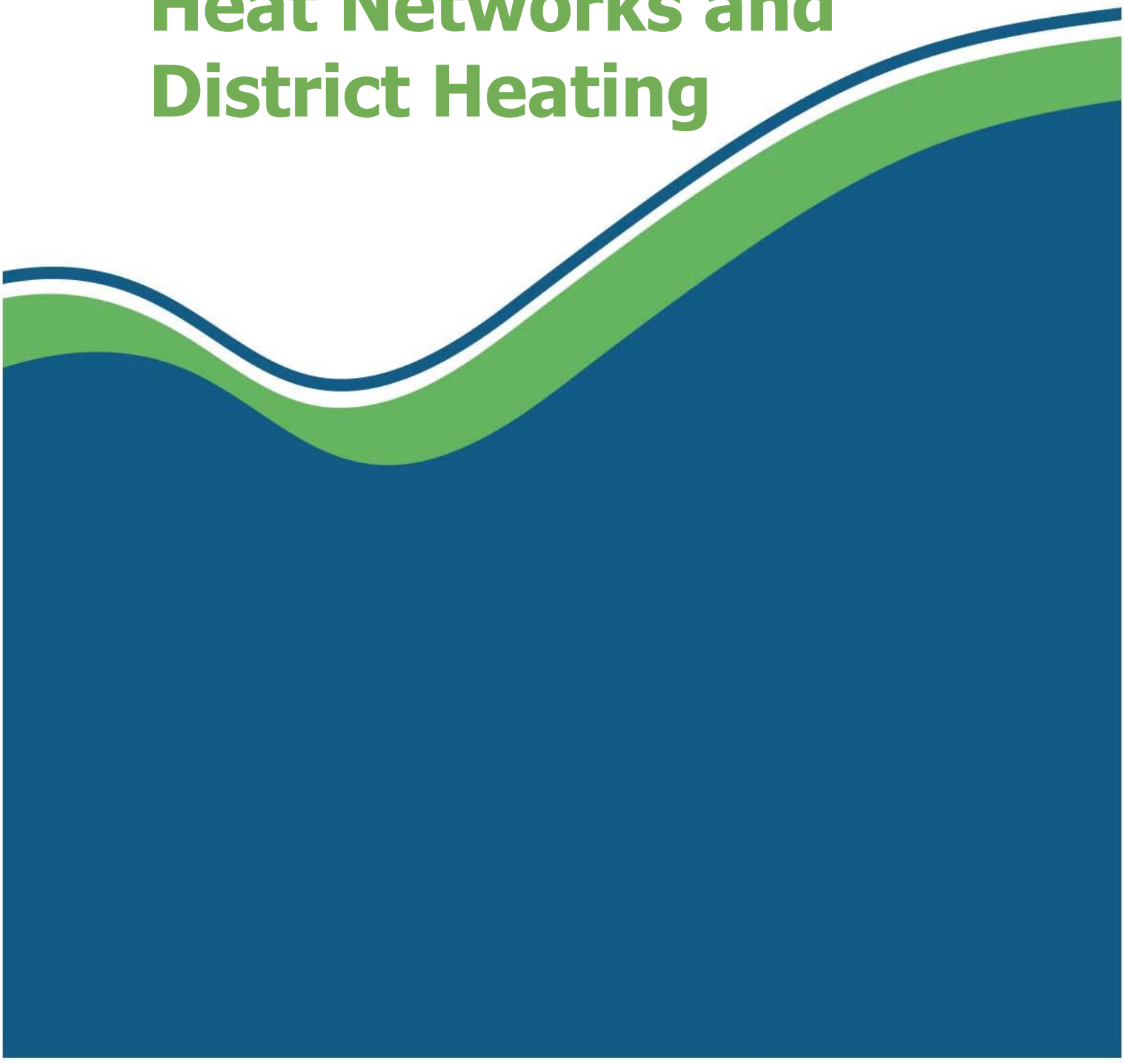
SEPA
Scottish Environment Protection Agency

Planning Background Paper

Heat Networks and District Heating



SCOTTISH ENVIRONMENT PROTECTION AGENCY	Identifier:	LUPS-BP-GU2c (ii) Heat Networks and District Heating
Land Use Planning System **SEPA Guidance**	Pages:	23
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Background Paper on Heat Networks and District Heating		

Update Summary

Version	*Description*
Version 1	First issue
Version 2	Update to requirements 1-3 and supporting text.

Notes

This document outlines SEPA's position on land use planning and Heat Network and District Heating. It is based on SEPA's interpretation of national planning policy and duties and requirements under relevant legislation.

This document is uncontrolled if printed. Always refer to the online document for accurate and up-to-date information.

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Why we comment on this topic

1. **SEPA's statutory purpose under the Regulatory Reform (Scotland) Act 2014** is "to protect and improve the environment, including managing natural resources in a sustainable way and that we must also contribute to improving the health and wellbeing of the people of Scotland and to the achievement of sustainable economic growth"

2. We have duties under the Public Bodies Climate Change (Scotland) Act 2009, with the Public Bodies Climate Change Act Guidance 2011 setting out how we are to comply with these duties.

3. District heating and heat networks are becoming increasingly important topic area. This is particularly pertinent given the role that Heat Networks and district heating systems can contribute towards the attainment of Scottish Government's targets including:
    - a reduction in carbon and greenhouse gas emissions using low-carbon heat sources;
    - the provision of alternative technologies to reuse excess (waste) heat; and
    - opportunities to decrease our reliance on carbon-based energy.

4. It is essential that heat networks and district heating opportunities are fully explored and delivered through the planning system if these targets are to be met. New developments have a role to play in not only establishing and creating these networks, but also in connecting to networks to make use of heat that is being captured. Planning authorities should consider the potential links between heat producers and heat users when allocating sites for development.

5. We assist the delivery of the Scottish Government's national and planning outcomes by providing environmental advice in relation to development plans and proposals across Scotland on Heat Networks and District Heating. As set out in the table, the advice we provide also directly contributes to achieving two of our corporate outcomes.

<table>
<tr><th colspan="6">Heat Networks and District Heating</th></tr>
<tr><th colspan="6">Scottish Government National Outcomes</th></tr>
<tr><td rowspan="2">National Planning</td><td>Outcomes

(relevant to Heat Networks and District Heating)</td><td colspan="2">A low carbon place – reducing our carbon emissions and adapting to climate change</td><td>A successful sustainable place – supporting sustainable economic growth and regeneration, and the creation of well-designed sustainable places</td><td>A natural, resilient place - helping to protect and enhance our natural and cultural assets, and facilitating their sustainable use</td></tr>
<tr><td>Policy Principles</td><td>Transformational change to a low carbon economy consistent with national objectives / targets.</td><td>Electricity generation from renewable energy technologies including heat networks</td><td>Guide development to appropriate locations.</td><td>Reduce emissions & energy use in new buildings & from new infrastructure.</td></tr>
<tr><td rowspan="2">SEPA</td><td>Purpose</td><td colspan="4">Protecting and improving the environment (including managing resources in a sustainable way). As long as it is not inconsistent with the above we will also contributes to (a) improving the health and well being of people in Scotland, and (b) achieving sustainable economic growth.</td></tr>
<tr><td>Corporate Outcomes

(relevant</td><td colspan="2">Scotland is developing in a way which is environmentally sustainable, taking advantage of the economic benefits presented by a</td><td colspan="2">Champion sustainable resource use and management of all resources and explain the environmental, social and economic benefits - We will work with</td></tr>
</table>

	to Heat Networks and District Heating)	**move to a low carbon economy and greater use of renewable energy sources -** resources are managed and used more sustainably and waste is managed as a resource. More materials are recycled and landfilling has been virtually eliminated.		Government and other partners to develop the necessary policies, regulatory framework, incentives and clear information to encourage citizens, public authorities and businesses to choose the most sustainable and resource-efficient products and services.	
	Position Statements	**Energy Position Statement** **Interim Position Statement on Planning, Energy and Climate Change**			
	Planning Objectives	To ensure that development plans make an effective contribution to national targets relating to heat.		To encourage use of heat maps to maximise opportunities for the use of waste heat in new development.	
	Supporting Objectives	'Headline ambition' to have **heat from renewable sources rrecognised as the first choice option** for new developments in areas of the gas grid and maximising opportunities for retrofitting.	**Actively engaging in the preparation of development plans to help identify favourable locations for thermal treatment of waste infrastructure** in relation to potential end users and the need to **achieve high energy efficiencies through heat recovery** from energy from waste infrastructure.	**Protecting the environment and human health from the effects of waste** management and disposal and applying the principles that underpin the waste hierarchy.	
	Planning Guidance	Development Plan Guidance	Development Management Guidance	Background Paper	Standing Advice

6. To deliver an efficient environmental protection system we must be able to plan, monitor and report on our work. We focus our efforts on working towards four outcomes for Scotland:

(i) Scotland's environment is protected and improving;

- Scotland is enjoying the economic and social benefits of a good quality environment, with businesses, communities and individuals all taking responsibility for reducing their environmental impacts. We protect the environment, communities and human health by practising world class environmental regulation, implementing legislation proportionately and rewarding good performance while taking tough action against those who fail to meet acceptable standards. Our activity is targeted towards tackling specific environmental problems through problem-solving projects, adopting innovative methods and partnerships, and working with key industry sectors.
- We deliver important environmental services for Scotland including air quality monitoring, flood warning, flood risk management, river basin management and emergency response.

(ii) Scotland's environment is understood and SEPA is an influential and respected authority;

- Scotland has a sound understanding of the environment, the resources and services it provides, the way it is impacted by climate change and human activity, and the effects it can have on human health and wellbeing. There is a co-ordinated approach to the monitoring of, and reporting on, Scotland's environment, which makes it easy for businesses, individuals and the academic community to obtain information, advice and guidance. The information and advice we provide is trusted.
- International legislation ensures a high level of environmental protection for Scotland. Policy makers in the EU, UK and Scotland have a good understanding of the issues affecting our environment.

(iii) Scotland is preparing for a sustainable future and is taking steps to limit climate change;

- Scotland is developing in a way which is environmentally sustainable, taking advantage of the economic benefits presented by a move to a low carbon economy and greater use of renewable energy sources. Resources are managed and used more sustainably and waste is managed as a resource.
- More materials are recycled and landfilling has been virtually eliminated. The environmental and economic benefits of more sustainable resource use and waste minimisation are understood, along with the need to choose low carbon products and services.

The Strategic Objectives for this outcome are particularly relevant to this topic area:

- Champion sustainable resource use and management of all resources and explain the environmental, social and economic benefits - We will work with Government and other partners to develop the necessary policies, regulatory framework, incentives and clear information to encourage citizens, public authorities and businesses to choose the most sustainable and resource-efficient products and services.

- Scotland has taken significant steps to tackle climate change. Collaborative efforts across society are reducing greenhouse gas emissions, supported by changes to behaviours. Statutory targets to reduce greenhouse gases are being met through policies and proposals across all sectors and energy production is decarbonising. Communities are more resilient to the impacts of climate change with key areas of risk and vulnerability addressed.

- Scotland is sustainably managing the use of resources, taking advantage of economic benefits presented by resource efficiency and the move to a low carbon economy. Our ecosystems are protected and the value of our resources to the economy and society is recognised. We are moving to a more circular economy where materials and products are kept in use for as long as possible.

(iv) SEPA is a high performance organisation.

- We are a flexible, responsive and innovative organisation, doing a better job and providing best value for taxpayers and charge payers, confirming our position as a world class environment protection agency. We work in partnership with public, private and third sector organisations to deliver high-quality, customer-focused services. We seek every opportunity to reduce the environmental impact of our activities.

Statutory Context

7. We have a duty under the Town and Country Planning (Scotland) Act 1997 and Planning etc (Scotland) Act 2006 to provide comments to Local Planning Authorities consultations on proposed Strategic and Local Development Plans and planning applications for major waste and energy related proposals.

8. The provision and promotion of Zero Waste advice through our Planning Service accords with the following statutory requirements within the table below.

Statute	Relevant Sections	Our Advice
Town and Country Planning (Scotland) Act 1997 and Planning etc (Scotland) Bill 2006	Section 4 and 15 - Town and Country Planning (Scotland) Act 1997 Section 2 and 18 – Planning etc (Scotland) Act 2006	Requirements to prepare Strategic and Local Development Plans under the aforementioned legislation ensures that SEPA are routinely consulted on Strategic and Local Development Plans to assess the acceptability of Heat Networks and District Heating Zero policies and/or Heat related strategic policy frameworks.
Development Management Procedure (Scotland) Regulations 2013	Schedule 5 – Consultation by the Planning Authority. The planning authority must consult with SEPA before determining an application for planning permission for the use of land for the deposit of any kind of refuse or waste, including slurry or sludge.	Local Planning Authorities have a statutory duty to consult SEPA as a statutory consultee for various waste-related development proposals to ensure adequate consideration of any potential environmental impacts.
The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011	Part 4 (Sections 14, 15, 19) - Preparation of Environmental Statements Part 5 (Section 19) Publicity & Procedures on Submission of Environmental Statements	Local Planning Authorities have a statutory duty to consult SEPA as a consultation body for various development proposals requiring consideration under EIA Screening / Scoping or where proposals are supported by an Environmental Statement.
Climate Change (Scotland) Act 2009	Part 4 - Public Body Duties	To ensure that we exercise our planning advisory role in the way best calculated to contribute the delivery of national greenhouse gas emission reduction targets.

Policy Context

9. Energy in Scotland 2014 (Scottish Government) estimates that heat accounts for over half of all the energy we use for our homes, offices, hospitals, businesses, schools, other buildings and industries. There are clear links between district heating and climate change. Switching from fossil fuel to renewable sources of heat has the potential to reduce greenhouse gas emissions, support delivery of climate change targets and make a significant contribution to Scotland's overall renewable energy target. The document defines renewable heat as:

> "*Renewable heat is heat produced from low carbon renewable sources such as biomass, heat pumps (ground source, air source and/or water source), heat from waste biomass and anaerobic digestion including biogas, solar heating, wind to heat and geothermal heat. It can be produced as either heat only or Combined Heat and Power*."

10. The Scottish Government has an ambition for a largely decarbonised heat sector by 2050 (Climate Change Delivery Plan, 2009 and 2020 Routemap for Renewable Energy in Scotland, Scottish Government 2011), with significant progress by 2030. They have also set a target to deliver 11% of non-electrical heat demand by renewable sources by 2020 ("2020 Routemap for Renewable Energy in Scotland", section 3.4).

11. The Climate Change Delivery Plan recognises the important role of the planning system in facilitating a more decentralised pattern of energy generation and supply (paragraph 4.5). The Plan identifies the following transformational outcome for the heat sector:

"A largely de-carbonised heat sector by 2050 with significant progress by 2030 through a combination of reduced demand and energy efficiency, together with a massive increase in the use of renewable or low-carbon heating." (paragraph 4.15)

And goes on to state:

"Ultimately, meeting Scotland's 2050 target will require heating in Scotland to be almost zero carbon by that time…achieving this outcome will require the replacement of the natural gas network with low-carbon heat. Significant progress on low carbon heat needs to be made by 2030 and, as with the 2020 target, priority areas might include the use of heat pumps, biomass and solar water heating in off-grid households and businesses and local heat networks in new housing developments" (paragraph 4.16).

"Achieving the Scottish Government's target of 11% renewable heat (which includes low carbon heat such as heat pumps) to 2020 will be critical to achieving the statutory targets set in the Climate Change (Scotland) Bill. We need to exploit the most cost effective opportunities to develop renewable heat in areas such as off-gas-grid domestic properties and the small business sector, and in the use of local heat networks in new housing developments…" (paragraph 4.27).

12. The Expert Commission on District Heating recommendations to the Scottish Government (November 2012) sets out the benefits that district heating can have on a number of policy areas, including heat poverty, and reducing emissions – a key figure stated is that there are potential reductions in carbon emissions averaging 30-40% as a result of substituting district heating for other forms of heating. The Expert Commission set out a number of recommendations for future areas of work which are intended to support the delivery of low-carbon renewable heat. One area of recommendation was the delivery of a national heat map. The Scottish Government published a national heat map in April 2014 which identifies existing sites of heat demand as well as sources of heat supply, both primary and potential secondary/surplus heat supply. There is great potential for use of the national heat map, which is explored below.

13. On 5 October 2011 the Energy Minister, Fergus Ewing, announced publication of an independent study into the recovery of heat from power generation in Scotland. The study examines the technical and financial prospects for recovery of heat from four sites used for large scale fossil fuel power generation in Scotland and then explores policies that could help make the recovery of heat a more practical option. Promoting recovery of heat from large scale power stations through building on the results of this study is highlighted as a key action in the 2020 Routemap for Renewable Energy in Scotland

14. The Scottish Government's Energy Efficiency Action Plan for Scotland (2010) identified a role for SEPA in district heating through Action 6.2 which states that the Scottish Government "*Will proactively develop district heating as a discrete policy area within energy efficiency, including by…(v) SEPA's advice to planning authorities re: water, heat and power.*"

15. The Scottish Government's support for low-carbon and renewable sourced heat is outlined in the Scottish Government's Heat Policy Statement: Towards Decarbonising Heat (June 2015). This sets a target of 40,000 homes to benefit from affordable low carbon heat from district heating, part of an overall target of 1.5TWh of heat to be delivered by district heating by 2020 to both domestic and non-domestic properties. This approach is sought to ensure that renewable heat makes a significant contribution to meeting Scotland's climate change targets and support the delivery of our renewable heat target.

16. The Heat Policy Statement sets out the Scottish Government's future policy direction for addressing the Heat including: how heat is used it (i.e. heat demand and its reduction); how

heat is distributed and stored it (i.e. heat networks and heat storage) and where our heat comes from (i.e. heat generation).

17. Additional initiatives provided by the Policy Statement include:

    - Designating energy efficiency as a National Infrastructure Priority. The cornerstone of this will be Scotland's Energy Efficiency Programme (SEEP) which will provide an offer of support to all buildings in Scotland – domestic and nondomestic – to improve their energy efficiency rating.
    - The Low Carbon Infrastructure Transition Programme (LCITP), launched in March 2015, with £76 million over the first 3 years, to provide tailored project development support for established and start-up infrastructure projects, including heat, across the private, public and community sectors.
    - A support programme for local authorities to develop a strategic approach to district heating and supporting use of the Scotland Heat Map to do so. These initiatives demonstrate the direction of travel we wish to take and how the Scottish Government aim to support a commercially viable, diverse heat sector in Scotland to 2050.

18. Each of these aspects is addressed by three specific objectives as set out in our Heat Hierarchy: reducing the need for heat; supplying heat efficiently and at least cost to consumers; and using renewable and low carbon heat.

19. The Statement discusses how we might stimulate potential investment to deliver de-carbonised heat through growing and emerging sectors such as district heating and geothermal; and support industries and business sectors through identifying opportunities for heat efficiency, heat recovery, and renewable sources.

Energy Efficiency Directive

20. In addition to heat that can be sourced from energy from waste facilities, geothermal heat and water from mines (ie where heat is a primary source), there is significant potential for using surplus or secondary source heat, that is heat that is currently wasted or unused which comes from industrial processes, waste water or from other industries. Maximising the use of secondary heat brings benefits to the heat source as it can reduce emissions, but it also can reduce the need for new primary heat sources, reducing emissions and the need to source fuel for the processes which generate heat. The EU Energy Efficiency Directive updates the EU's legal framework for energy efficiency, pursuing the target of saving 20% of the EU's primary energy consumption by 2020, and of making further energy efficiency improvements after 2020. In order to maximise the potential for district heating networks to be established, new developments with the potential to deliver heat, including waste heat from industrial processes, should consider the potential for providing heat to areas of high heat demand.

21. This "co-location" will provide a benefit for both heat user and supplier, and will enable the supplier to consider the potential for providing heat as required under the Energy Efficiency Directive Article 14. Article 14 encourages the identification of cost effective potential for delivering energy efficiency through cogeneration (combined heat and power), efficient district heating and cooling, and recovering industrial waste heat. Under Article 14 (5) specific developments (new installations and substantial refurbishments) will be required to assess the cost and benefit of utilising heat generated for use in cogeneration of heat and power, reusing waste heat and/or connecting the installation to a district heating and cooling network. This requirement will, through The Pollution Prevention and Control (Scotland) Amendment Regulations 2014, come into force from 30th October. Scottish Government have chosen to serve SEPA with Directions (The Pollution Prevention and Control(Energy Efficiency Directive)(Scotland)Directions 2014) and the requirement for the Cost Benefit Analysis to be

undertaken will be met through the PPC application process. The EED requirements apply to any installation with a total thermal input greater than 20MW aggregate ie includes sites that have a number of small boilers,etc, that may not meet the current thresholds for PPC.

National Planning Framework 3 and SPP

22. NPF3 National Planning Outcomes which consideration and incorporation of this issue into Development Plans would contribute towards are:

    - **a successful sustainable place** – supporting sustainable economic growth and regeneration, and the creation of well-designed sustainable places
    - **a low carbon place** – helping to reduce our carbon emissions and adapt to climate change, and supporting the transition to a low carbon place

23. Scottish Planning Policy 2014 outlines the key Scottish Government planning policy principles relating to delivering renewable heat and electricity. A clear position is made in paragraph 153 that "*Terrestrial and marine planning facilitate development of renewable energy technologies, link generation with consumers and guide new infrastructure to appropriate locations. Efficient supply of low carbon and low cost heat and generation of heat and electricity from renewable energy sources are vital to reducing greenhouse gas emissions and can create significant opportunities for communities.*"

24. Policy Principles in paragraph 154 state that:

    The planning system should:

    - *Support the transformational change to a low carbon economy, consistent with national objectives and targets, including deriving:*
        - *30% of overall energy demand from renewable sources by 2020;*
        - *11% of heat demand from renewable sources by 2020; and*
        - *The equivalent of 100% of electricity demand from renewable sources by 2020.*
    - *Support the development of a diverse range of electricity generation from renewable energy technologies – including the expansion of renewable energy generation capacity – and the development of heat networks;*

25. The Scottish Government provides additional advice on Planning and heat online and additional support and information on district heating projects can be found from the *Heat Network Partnership*.

26. In addition to the role described to meet the requirements of EED Article 14 (as described above), SEPA's Energy Position Statement clearly outlines our position regarding heat, and the expectations we have for this to be incorporated in policies and statements from other bodies.

    SEPA's Energy Position Statement

27. The following provides a summary of the relevant policies within this document:

    'SEPA will:

    - *Encourage a diversity of energy sources that integrate energy supply and demand, especially supporting efficient use of surplus heat, and heat from renewable sources (page 3).*

    Position Statement 2: generator location and scale

- *SEPA believes that electricity generating installations should be appropriately located and scaled, to avoid adverse offsite impacts, minimise energy losses through heat recovery and use, to minimise greenhouse gas emissions and optimise energy productivity, considering both individual and cumulative impacts.*

- *Support for renewables should be set within a policy framework that acts to optimise the environmental benefits of energy developments and to avoid unintended adverse consequences, wherever those may be. Displacement of food production and other land use changes such as deforestation can lead to unsustainable production of bioenergy fuels.*

Position Statement 5: carbon capture and heat readiness

- *…Large scale gas and biomass thermal plants are required to be carbon capture ready, and should also seek to have heat recovery, a suitable heat plan in line with SEPA's guidance outlined in the thermal treatment of waste guidelines.*

28. Under SEPA's Guiding Principles (Section 3) it also states that:

'SEPA will

- *Encourage a diversity of energy sources, and developments that integrate energy supply and demand, especially supporting efficient use of surplus heat, and heat from renewable sources;*

- *The above principles outline SEPA's high level strategic approach and, over time, will be translated into guidance or specific documents addressing their practical application.*

29. Section 5.2.4 (The way forward) states that:
    - *'Policies need to encourage greater development of Combined Heat and Power (CHP) at different scales. CHP allows more of the energy contained within a fuel to be used (both as heat and electricity) than would be possible if the fuel was used for electricity generation alone. CHP reuses the waste heat resulting from electricity generation as a resource to replace the need for primary energy fuels to make heat separately. Greater use of CHP technology should be supported by thermal master planning and mapping, which involves the careful planning and location of heat users to ensure that waste heat from one user can be reused in other processes and buildings. Maximising the energy efficiency of thermal treatment facilities through heat recovery should be a key consideration in site allocation. The Scottish Government's renewable heat plan contributes to achieving this, and will be supported by the Scottish Government's energy efficiency action plan in delivering lower carbon and renewable heat through co-ordinated and integrated policy.*

30. Section 5.4.3 (SEPA's approach) then goes on to outline that:
    - *'SEPA seeks to influence planning decisions to ensure that all energy and resource recovery installations are appropriately located and scaled to avoid impacting upon human health and the environment, and to optimise the potential benefits from such activities – for example through heat recovery and district heating. A good example is the Lerwick district heating scheme'.*

31. Under Section 5.4.4 (The Way Forward) it is stated that:
    - *SEPA would also encourage planning authorities, funders and developers to engage with SEPA at an early stage, to identify opportunities for synergistic developments that will maximise the efficiency and operational value of energy from waste facilities, such as combined heat and power and district heating.*

32. In terms of Storage, Grid and Infrastructure (Section 6) it is stated that:
    - *'SEPA seeks an integrated and holistic view of energy infrastructure needs that considers energy in all its forms, including heat infrastructure, to enable the range of different sources, scales and methods of generation'.*

33. Our Interim Position Statement on Planning, Energy and Climate Change clarifies how we intend to engage with the planning system on energy and climate change issues, and the role the Planning Service will take in this engagement. It states in paragraph 15 that:

> *"We will also seek to take an effective lead on achieving high energy efficiencies through heat recovery particularly in relation to energy from waste infrastructure. The Scottish Government recognises the important role of renewable heat in its Renewables Action Plan. This includes a "headline ambition" of "having heat from renewable sources recognised as the first choice option for new developments in areas of the gas grid and maximising opportunities for retrofitting." In addition to woody biomass, waste biomass is now recognised a major contributor to renewable bio-energy in Scotland."*

34. We have an important role to play in helping to deliver the renewable heat aspects of the Renewables Action Plan by actively engaging in the preparation of development plans to help identify favourable locations for thermal treatment of waste infrastructure in relation to potential end users. Maximising the energy efficiency of thermal treatment facilities through heat recover should be a key consideration in site allocation."

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How we comment on this topic

35. In relation to planning for Heat Networks and District Heating systems our role is to encourage responsible authorities to explore opportunities to enable the delivery of low-carbon heat network opportunities within Strategic and Local Development Plans.

36. Our consultation comments on Development Plans seek to ensure that future development options plan for the provision and/or subsequent connection to such networks to help achieve, and comply with targets, to reduce carbon-based emissions within the context of Scotland's overarching planning policy framework on renewable energy.

37. Our planning position, based on the documents, guidance and statements above, encourages the use of renewable heat and district heating. We provide consultation responses on Development Plans to this effect. We therefore recommend to planning authorities that consideration is given in Development Plans towards the implementation of heat networks/district heating, and require that links are made between proposals for renewable energy facilities generating excess (waste) heat and potential 'heat users' nearby.

38. We recommend that information is included to expect developers to take into account and be designed to make use of the potential for district heating to use the heat identified in the heat map. (This is not limited to housing developments, as all land uses can benefit from using heat).

39. This document seeks to provide concise, consistent and robust advice to outline SEPA's position in relation to planning for the delivery of Heat Networks and District Heating opportunities within Development Plans.

SEPA's overarching objectives in providing advice to planning authorities on Heat Networks and District Heating related matters are:

- To ensure that development plans make an effective contribution to national targets relating to heat; and,
- To encourage use of heat maps to maximise opportunities for the use of waste heat in new development.

40. Our approach to Heat Networks and District Heating is set out in the following documents. This background paper provides the context and justification for the advice contained in the guidance notes. It also explains how our requirements and recommendations can be achieved.

    - SEPA Interim Position Statement on Planning, Energy and Climate Change.
    - SEPA Energy Position Statement.
    - SEPA LUPS-DP-GU2c: Development Plan Guidance on Sustainable Resource Use and Energy.
    - SEPA LUPS-GU6: Guidance on input to development management consultations in relation to Zero Waste Plan issues 2013 (and any revised versions / updated Zero Waste Development Management Guidance).
    - SEPA Thermal Treatment of Waste Guidelines 2014.

Development Plans

41. The central issue we will consider when consulted on a Development Plan and/or the proposed development of Heat Networks and District Heating is whether the proposed Plan objectives or alternatively the proposed development will support the delivery of low-carbon energy generation objectives.

42. The ability to encourage innovative heat networks that reduce our reliance on carbon based energy production and the efficient re-use of (previously discarded) waste is considered to be critical to achieve a reduction in both greenhouse gas emissions and the potential impacts associated with climate change.

43. Initially your assessment should base consideration of this issue on:

    - SEPA's Development Plan Guidance: Sustainable Resource Use and Energy (LUPS-DP-GU2-C)

44. This will be backed by key policy documentation and guidance to support the assessment of such proposals including:

    - National Planning Framework 3 NPF3.
    - Scottish Planning Policy (2014) – (Delivering Heat & Electricity Chapter p36–38: para 152 – 160).
    - Zero Waste Plan Scotland (2010) – Objectives, Waste Targets and Actions 1 -22.
    - Energy in Scotland 2014
    - Climate Change Delivery Plan 2009
    - 2020 Routemap for Renewable Energy in Scotland
    - Expert Commission on District Heating
    - National Heat Map for Scotland
    - Energy Efficiency Action Plan
    - Outline Heat Vision
    - The Heat Policy Statement: Towards Decarbonising Heat: Maximising the Opportunities for Scotland 2015
    - Energy Efficiency Directive

SEPA:

- SEPA's Energy Position Statement
- SEPA's Interim Position Statement on Planning, Energy and Climate Change
- SEPA's Thermal Treatment of Waste Guidelines (2014).

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SDP Requirement 1: Low Carbon Energy Distribution Wording

LDP Requirement 1: Low Carbon Energy Distribution Wording

Low Carbon Energy Distribution Wording

1. Include policy wording which supports low carbon district heating networks.

Context

National	Planning outcome(s)	A natural, resilient place		A low carbon place	
	Planning principle(s)	Transformational change to a low carbon economy consistent with national objectives / targets.	Electricity generation from renewable energy technologies including heat networks	Guide development to appropriate locations.	Reduce emissions & energy use in new buildings & from new infrastructure.
SEPA	Planning objective(s)	To ensure that development plans make an effective contribution to national targets relating to heat.		To encourage use of heat maps to maximise opportunities for the use of waste heat in new development.	

How this can be achieved

Strategic and Local Development Plans

46. Strategic and local development plans can meet this requirement by providing a positive policy framework to promote:

    1. low carbon district heating networks for new development sites;

    2. the co-location of new development with 'waste heat' sources through the use of national and, where available, local heat maps; and,

    3. the use of other low carbon sources of renewable heat such as biomass or geothermal for new development sites.

The national heat map is available on the Scottish Government's website here:

http://www.gov.scot/Topics/Business-Industry/Energy/Energy-sources/19185/Heat/HeatMap

Justification

47. Development plans have an important role to support the development of heat networks, allocating land to enable the co-location of heat supply and demand both now and for the future. Policies can also support the realisation of renewable heat capture through, where appropriate, requiring that new developments are designed to be capable of connecting to district heating networks that currently exist or are planned for the future.

48. This position is supported by a policy framework underpinned by SPP (Paragraph 154) which indicates that the planning system should support a 'transformational change' to allow for the provision of a low-carbon economy that allows for renewable energy targets to be met including:
    - *30% of overall energy demand from renewable sources by 2020;*
    - *11% of heat demand from renewable sources by 2020; and*
    - *the equivalent of 100% of electricity demand from renewable sources by 2020.*

49. It also expressly supports the provision of heat networks and the growth in a diverse range of electricity generation from renewable (or low carbon) energy technologies. Under this policy, Development Plan are required to identify suitable locations for such developments and clarify applicable requirements / design considerations required to be assessed for the provision of such facilities. This policy then goes on to advocate any renewable energy generation facilities within new buildings and/or infrastructure that could enable the reduction of carbon emissions including energy efficiency, heat recovery, efficient energy supply/storage, electricity and heat from renewable sources. In this regard, SPP (Paragraph 156) also states that Strategic Development Plans support national priorities to construct and/or improve strategic energy infrastructure (generation, storage, transmission and distribution networks) to address cross-boundary issues and ultimately provides a Scottish-wide approach to electricity and heat that supports a transition to a low carbon economy.

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SDP Requirement 2: Connecting Substantial / Anchor Developments

LDP Requirement 2: Connecting Substantial / Anchor Developments

Strategic Development Plans and Local Development Plans: Connecting Substantial / Anchor Developments

A requirement should be placed on all substantial developments to ensure that their heat demand is met through a district heating network. This should be achieved through onsite heat generation or co-location with a heat source or connection to an existing or planned district heating network.

Context

National	Planning outcome(s)	A natural, resilient place		A low carbon place	
	Planning principle(s)	Transformational change to a low carbon economy consistent with national objectives/targets.	Electricity generation from renewable energy technologies including heat networks	Guide development to appropriate locations.	Reduce emissions & energy use in new buildings & from new infrastructure.
SEPA	Planning objective(s)	To ensure that development plans make an effective contribution to national targets relating to heat.		To encourage use of heat maps to maximise opportunities for the use of waste heat in new development.	

How this can be achieved

50. Strategic Development Plans

Strategic development plans can meet this requirement by:

1. Ensuring that the heat demand of strategic development sites is met through a district heating network sourced by either onsite heat generation or through connection to existing or proposed district heating networks or other significant heat sources identified from the national, or where available, local heat map. This could be achieved through a development requirement or other clear policy commitment for delivery; and,
2. Directing LDPS to ensure that substantial* developments allocations meet their onsite heat demand through district heating networks.

Local Development Plans

Local development plans can meet this requirement by ensuring that the heat demand of substantial* allocations is met through a district heating network sourced by either onsite heat generation or through connection to existing or proposed district heating networks or other significant heat sources identified from the national, or where available, local heat map. This should be achieved through a development requirement or other clear policy commitment for the delivery of the network.

*'Substantial' developments may consist of new towns, urban extensions, large regeneration areas or large development sites subject to master planning. There is, however, an element of judgment that will need to be applied here and it might be that some sites offer significant potential for heat networks due their location, support from the local authority and 'buy in' from developers.

The national heat map is available on the Scottish Government's website here:

http://www.gov.scot/Topics/Business-Industry/Energy/Energy-sources/19185/Heat/HeatMap

Justification

51. In order to deliver the Scottish Government's targets for 40,000 homes to be heated through heat networks, new developments need to be designed to incorporate district heating. Where substantial new developments are planned, the opportunity arises for providing a heat network within the site and for this to be required and designed in at the earliest stages. New developments have a role to play in not only establishing and creating these networks, but also in connecting to networks to make use of heat that is being captured.

52. Paragraph 154 of SPP states that the planning system should support the transformational change to a low carbon economy consistent with national objectives and targets including deriving 11 % of heat demand from renewable sources by 2020. Paragraph 159 of SPP goes on to advocate that Local Development Plans should support the development of heat networks in as many locations as possible even where these may be initially reliant on carbon-based fuels if there is potential to convert them to low carbon fuels in the future. Maximising the use of existing waste heat sources should always be explored and heat mapping used to co-locate developments with a high heat demand with sources of heat supply (paragraph 158).

53. Paragraph 159 of SPP also states that LDPs should specifically identify appropriate locations for the development of heat networks/storage/energy centres and include heat policies that support the implementation of this approach.

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LDP requirement 3: Potential Connection and Safeguarding Land

Local Development Plan: Potential Connection and Safeguarding Land

New developments located adjacent to existing or proposed heat networks or significant heat sources should be designed to be capable of connecting to the heat supply. Land required for the heat network infrastructure should be protected.

Context

National	Planning outcome(s)	A natural, resilient place		A low carbon place	
	Planning principle(s)	Transformational change to a low carbon economy consistent with national objectives/targets.	Electricity generation from renewable energy technologies including heat networks	Guide development to appropriate locations.	Reduce emissions & energy use in new buildings & from new infrastructure.
SEPA	Planning objective(s)	To ensure that development plans make an effective contribution to national targets relating to heat.		To encourage use of heat maps to maximise opportunities for the use of waste heat in new development.	

How this can be achieved

54. The plan can achieve this in two ways:

1. **Policy framework**

Developments affected by this policy can be identified through reference to the national heat map and any local heat maps which will provide information on significant heat sources within the local plan area. Significant heat sources, alongside any proposed and existing heat networks should be identified on the LDP proposals map to assist implementation of the policy.

The policy framework should ensure that such new developments incorporate space to be safeguarded for future pipework/piperuns and energy centres. This space can be incorporated into grass/green corridors along footpaths or roads so that they can be more easily excavated for installing heat network pipes without significant disturbance. The policy framework should also ensure that the any land required for the network is protected so that new infrastructure does not obstruct the development of the planned heat network.

2. **Site allocation requirements**

Any site allocations being brought forward through the development plan which are adjacent to significant heat sources or any proposed or existing heat networks should have a site requirement attached to them to ensure that they are designed to be capable for connection to a heat network from that that source and that any land required for the heat network infrastructure is protected.

The national heat map is available on the Scottish Government's website here:

- http://www.gov.scot/Topics/Business-Industry/Energy/Energy-sources/19185/Heat/HeatMap

Justification

55. In order to deliver the Scottish Government's targets for 40,000 homes to be heated through heat networks, new developments need to be designed to incorporate district heating. Where substantial new developments are planned, the opportunity arises for providing a heat network within the site and for this to be required and designed in at the earliest stages. New

developments have a role to play in not only establishing and creating these networks, but also in connecting to networks to make use of heat that is being captured.

56. Paragraph 154 of SPP states that the planning system should support the transformational change to a low carbon economy consistent with national objectives and targets including deriving 11 % of heat demand from renewable sources by 2020. Paragraph 159 of SPP goes on to advocate that Local Development Plans should support the development of heat networks in as many locations as possible even where these may be initially reliant on carbon-based fuels if there is potential to convert them to low carbon fuels in the future. Maximising the use of existing waste heat sources should always be explored and heat mapping used to co-locate developments with a high heat demand with sources of heat supply (paragraph 158).

57. SPP (paragraph 159) states that LDPS should identify the location of existing/proposed/anticipated heat networks, support their development, and make provision to safeguard land for piperuns that would allow for subsequent connection to heat networks, pipelines and/or energy hubs.

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SDP Recommendation 1: Heat Mapping to Identify Networks

LDP Recommendations 1-3: Using Heat Mapping, Design Capability and Water Environments.

Strategic Development Plan Recommendation 1: Heat Mapping to Identify Networks

1. Heat maps are used to identify opportunities for schemes to promote heat networks, site-specific where possible. Cross boundary co-ordination is considered for development of heat networks and district heating schemes.

Local Development Plan Recommendations 1-3: Using Heat Mapping, Design Capability and Water Environments.

1. Where possible, LDPs should identify the allocated development sites that can be grouped together to improve the viability of developing a heat network.
2. Design/sustainable development policies require that new development located close to existing or proposed heat networks or sources of renewable heat should be designed to be capable of connecting to make use of district heating.
3. Any areas of search for water as a heat source should avoid sensitive and/or protected water environments.

Context

National	Planning outcome(s)	A natural, resilient place		A low carbon place
	Planning principle(s)	Transformational change to a low carbon economy consistent with national objectives/targets.	Electricity generation from renewable energy technologies including heat networks	Guide development to appropriate locations.
SEPA	Planning objective(s)	To ensure that development plans make an effective contribution to national targets relating to heat.		To encourage use of heat maps to maximise opportunities for the use of waste heat in new development.

How this can be achieved

58. The above mentioned SDP and LDP recommendations are quite detailed and therefore require little further explanation in relation to their implementation. It is recommended that these approaches are followed to help implement strategic heat network objectives.

Justification

59. We advise local authorities to make use of the National Heat Map when preparing their development plans. The Scottish Government published the national heat map in 2014 with data available to all local authorities showing heat demand and supply across the country. The heat map identifies both a range of existing potential heat generators, including all types of technology from existing energy generating power stations to potential sources of heat from wind farms, and heat demand. A full user guide can be found on the Scottish Government Heat Map webpage.

60. Using heat maps can help local authorities to identify appropriate development sites for major heat providers in order to maximise the use of the heat generated, and can also be used to identify major allocations for new developments to make use of existing and proposed heat providers, for example new employment or industrial sites could be allocated adjacent to existing

landfill gas facilities. For major developments, masterplans could be required to identify space within the overall site which can be utilised by a heat provider, if one has not been identified already.

61. A key issue to overcome in the development of district heating networks is the design of new developments. In order to make use of existing or planning district heating networks, new development sites must be capable of connection. This can include anything from installing pipe network at the time of construction of the development, if the district heating network is far advanced or will be built as part of the new development, or incorporating in the site layout green channels/grass/planting which can accommodate pipe network in future.

62. Grouping together allocated sites can provide opportunities to make heat networks more viable, than if sites are treated individually. This can allow for economies of scale, for example more premises justifying larger and more efficient heat providers, or reducing initial outlay costs for infrastructure like pipework throughout all of the development sites. Midlothian Council has drafted policy which considers grouping sites in this manner, wording copied below in Good Practice section. The Scottish Government's consultation on the Energy Efficiency Directive Article 14 (5)-(8) provides some guidance on feasible distances for creating district heating. It is expected that full guidance will be prepared regarding implementation of this requirement for Cost Benefit Analysis into the feasibility of creating Combined Heat and Power networks including guidance on distances between heat suppliers and potential heat users.

63. Consider also any potential limiting effects of major new road networks/bypass routes. These may cut off district heating networks or cause problems in the future for expansion of district heating networks. If the local authority is considering development of a new network or expansion of an existing network, it should also take into account where major infrastructure could affect the layout of the network. Where appropriate, new road development can require access points to be incorporated to allow for future pipe development, for example creating channels underneath the road/infrastructure to enable pipe development with minimal disruption to the infrastructure.

64. Where a planning authority has already created their own Heat Map, identifying existing heat networks, this could be used to identify where new connections could be made to create heating for new developments. Fife Council heat map shows existing and potential heat networks; in Dunfermline the heat network has potential to extend to an anchor load (hospital) which would open up additional district heating opportunities in residential areas between the existing network and the anchor load. Major development sites are also adjacent to the existing network, which allows the potential to provide district heating to new development.

Water as Heat Source

65. There is an opportunity to utilise water as a source of heat. This can include using underground water (eg minewater, geothermal) as a heat source, extracting water from below ground, as well as using water from rivers or coastal waters.

66. If a development plan has identified that river water is a potential source of heat within their area, we recommend that care is taken to avoid sensitive areas or protected water bodies. As water is extracted from the river and cooled down (normally by approximately 2°c), the discharge of the water into the river may have an effect on the ecological systems within or dependent on the water body. Development plans should identify if there are any protected water environments that should be protected from any potential impacts arising from using water as a heat source.

67. The following policy framework supports the Development Plan requirement identified above:

68. SPP (paragraph 40) requires that spatial strategies within Development Plans promote a sustainable pattern of development set against principles to enhance the potential of existing resources by ensuring that appropriate infrastructure investment (including heat networks) is paired with development growth.

69. Building on this position, SPP (Paragraph 154) indicates that the planning system should support a 'transformational change' to allow for the provision of a low-carbon economy that allows for renewable energy targets to be met. These include:

    - 30% of overall energy demand from renewable sources by 2020;
    - 11% of heat demand from renewable sources by 2020; and
    - the equivalent of 100% of electricity demand from renewable sources by 2020.

70. It also expressly supports the provision of heat networks and growth in a diverse range of electricity generation from renewable (or low carbon) energy technologies. Under this policy, Development Plan are required to identify suitable locations for such developments and clarify applicable requirements / design considerations required to be assessed for the provision of such facilities. This policy then goes on to advocate any renewable energy generation facilities within new buildings and/or infrastructure that could enable a reduction in carbon emissions including energy efficiency, heat recovery, efficient energy supply/storage and electricity and heat from renewable sources.

71. In the same vein, SPP (Paragraph 158) specifically requires the provision of localised heat mapping to identify the potential for co-location of heat supply sources (with excess heat generation i.e. CHP, biogass, geothermal etc) and high demand energy users. Building on this, it is recommended that heat recovery is utilised to harness residual heat recovery systems from these sources and that heat storage schemes are implemented enable the re-use of excess heat within fuel-poor areas, areas 'off the gas grid' or anchor development such as large mixed use schemes, hospitals, schools and leisure centres etc.

72. Critically, SEPA Thermal Treatment of Waste Guidelines is a material consideration in the determination of planning applications for thermal treatment facilities. This document provides clarity on SEPA's position to such facilities and outlines various requirements to be met within the planning application and any subsequent regulatory requirements.

73. Section 2.4 (page 4) provides a strong indication of our position indicating that: "it is important for new developments to maximise the opportunities to use existing and proposed heat and energy sources. We will continue to encourage planning authorities to consider this an integral element in their assessment of land allocations for their development plans. We will expect that where heat networks and heat generators do exist that any new development proposed in the vicinity will be connected to these sources."

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