



Low Carbon Fife

Supplementary Guidance - Appendices

January 2019

Appendix A: Fife Onshore Wind energy Cumulative Impact Assessment – update June 2018

Fife Onshore Wind Energy Review - Strategic Cumulative Landscape and Visual Impact Assessment – Background and update:

In 2012 Ironside Farrar produced the *Fife Onshore Wind Energy Review- Strategic Cumulative Landscape and Visual Impact Assessment – Nov 2012*. This was updated in May 2013 to inform Fife Council's *Wind Energy Planning Supplementary Guidance June 2013*.



The methodology used in this study remains valid and has been used to reassess the impact of cumulative change since 2013. The reassessment takes into account consents for wind turbine proposals granted since the study was published and removes any proposals whose consents have lapsed.

To provide clarity the table below sets out how the assessment information originally presented in the Ironside Farrar study has been referenced in different documents as it has been updated.

	Fife Onshore Wind Energy Review- Strategic Cumulative Landscape and Visual Impact Assessment – Nov 2012	Wind Energy Planning Supplementary Guidance June 2013	Draft Low Carbon Fife Supplementary Guidance June 2018
Plan: Wind Turbine Typology: Proposed limit to development	Figure 6.3	Diagram 8	Appendix A Figure A3
Table: Summary of landscape capacity, cumulative impacts and guidance for future wind energy developments	Table 6.1	Table 2	Appendix A Table A2
Table: Areas where cumulative impacts limit further development: Description and Key Objectives	Table 6.2	Table 1	Appendix A Table A1

The Ironside Farrar study:

- Takes Fife's landscape character areas as the base for the assessment (see figure A1);

- Establishes the inherent capacity of different Fife landscapes to accommodate wind turbine development;
- Establishes and describes different types of wind turbine landscapes (see below):

Description of Levels of Cumulative Wind Turbine Development (Extract from the *Fife Onshore Wind Energy Review- Strategic Cumulative Landscape and Visual Impact Assessment – May 2013*)

Wind Turbine Landscape Type	Landscape Character	Visual Experience
Landscape with no Wind Turbines	A landscape type or area in which no, or a minimal number/size of wind turbines is present, or visible from neighbouring areas.	There would be no, or negligible, effects on visual receptors.
Landscape with Occasional Wind Turbines	A landscape type or area in which windfarms or wind turbines are located and/or are close to and visible. However they are not of such a size, number, extent or contrast in character that they become one of the defining characteristics of the landscape's character.	Visual receptors would experience occasional close-quarters views of a windfarm or turbines and more frequent background views of windfarms or turbines. Some of the turbines would not be perceived as being located in the landscape character type or area. No overall perception of wind turbines being a defining feature of the landscape.
Landscape with Wind Turbines	A landscape type or area in which a windfarm, windfarms or wind turbines are located and/or visible to such an extent that they become <i>one</i> of the defining characteristics of the landscape character. However, they are clearly separated and not the single most dominant characteristic of the landscape.	Visual receptors would experience frequent views of windfarms or wind turbines as foreground, mid-ground or background features, affecting their perception of the landscape character. However there would be sufficient separation between windfarms and turbines and sufficient areas from which wind turbines are not visible such that they would not be seen as dominating the landscape over all other landscape features.
Wind Turbine Landscape	A landscape type or area in which windfarms or wind turbines are extensive, frequent and nearly always visible. They become the dominant, defining characteristic of the landscape. Nevertheless there is a clearly defined separation between developed areas.	Visual receptors would experience views of windfarms as foreground, mid-ground and background features, to the extent that they are seen to dominate landscape character. Few areas would be free of views of wind turbines.
Windfarm	Landscape fully developed as a windfarm with no clear separation between groups of turbines. Few if any areas where turbines not visible.	Visual receptors would always be close to and nearly always in full view of wind turbines.

- Sets out proposed limits to wind turbine development for the landscapes of Fife based on the wind turbine landscape typologies (see Figure A3);
- Assesses the cumulative impact of wind turbine developments which have been granted planning consent – this information has been updated and is presented in table A2 and Figure A2.
- Establishes key objectives for areas where the cumulative impact limits further development – this information has been updated and is presented in table A1.

SNH Landscape Character Areas

- Coastal Braes
- Coastal Cliffs
- Coastal Flats
- Coastal Hills
- Coastal Island
- Coastal Terraces
- Inland Loch
- Loch Island
- Lowland Dens
- Lowland Glacial Meltwater Valleys
- Lowland Hills and Valleys
- Lowland Loch Basin
- Lowland Open Sloping Farmland
- Lowland River Basin
- Pronounced Volcanic Hills and Craigs
- Upland Foothills
- Upland Hills and Hill Slopes, The Lomond and Cleish Hills
- Urban
- Fife Council Boundary

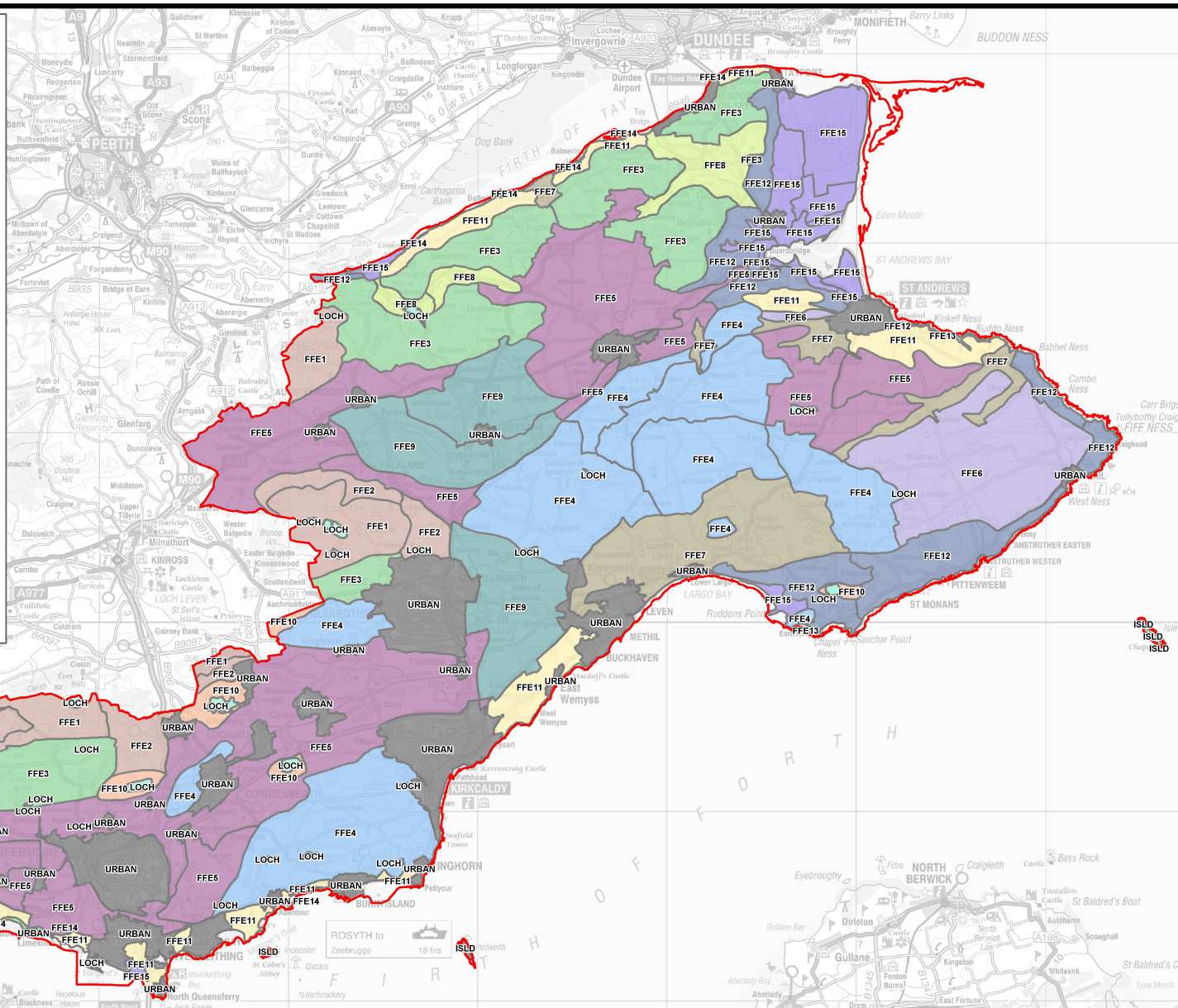


Figure A1 SNH Landscape Character Areas

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Service: EPES
Printing Date: 01 November 2016



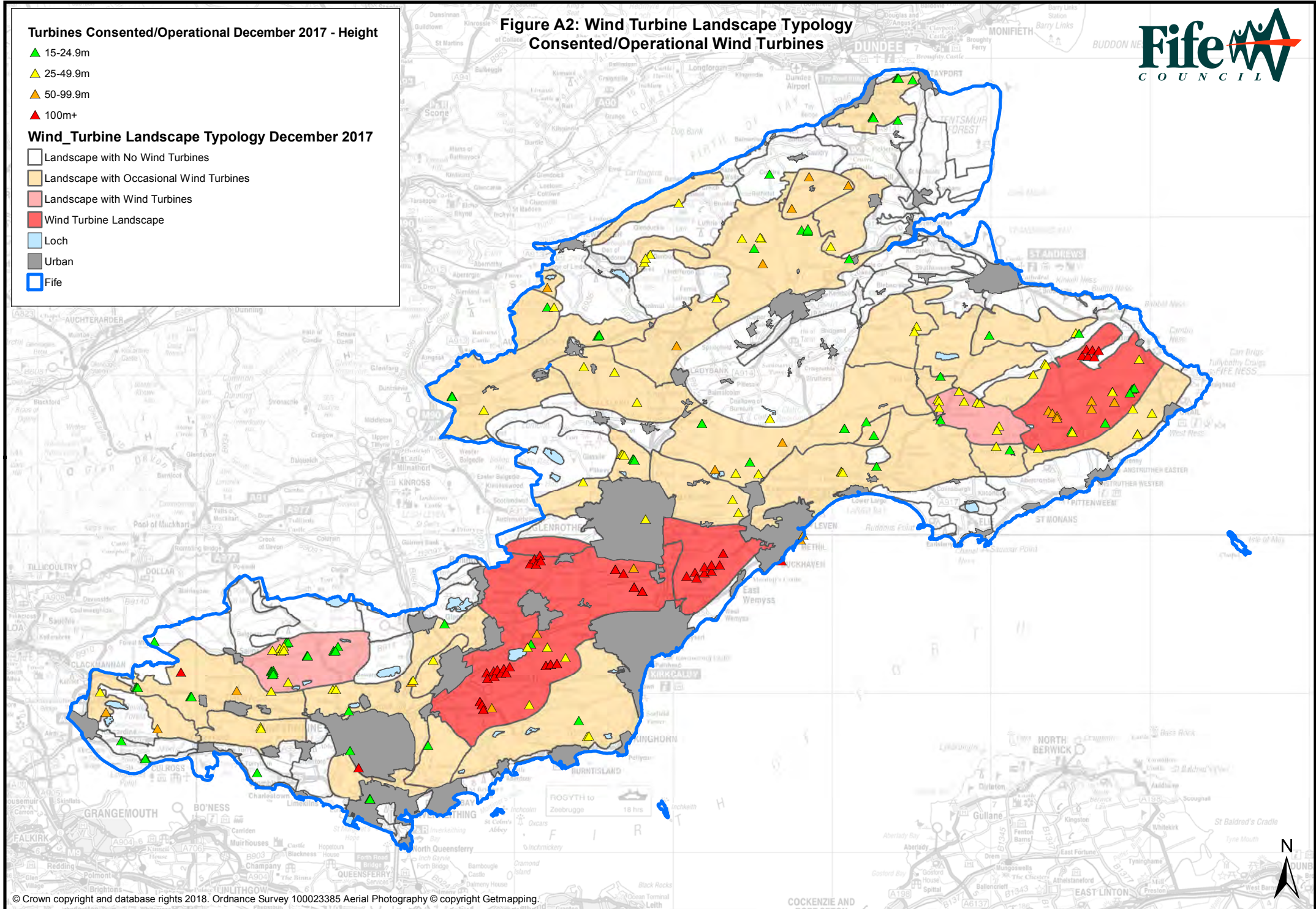
Turbines Consented/Operational December 2017 - Height

- ▲ 15-24.9m
- ▲ 25-49.9m
- ▲ 50-99.9m
- ▲ 100m+

Wind_Turbine Landscape Typology December 2017

- Landscape with No Wind Turbines
- Landscape with Occasional Wind Turbines
- Landscape with Wind Turbines
- Wind Turbine Landscape
- Loch
- Urban
- Fife

Figure A2: Wind Turbine Landscape Typology
Consented/Operational Wind Turbines



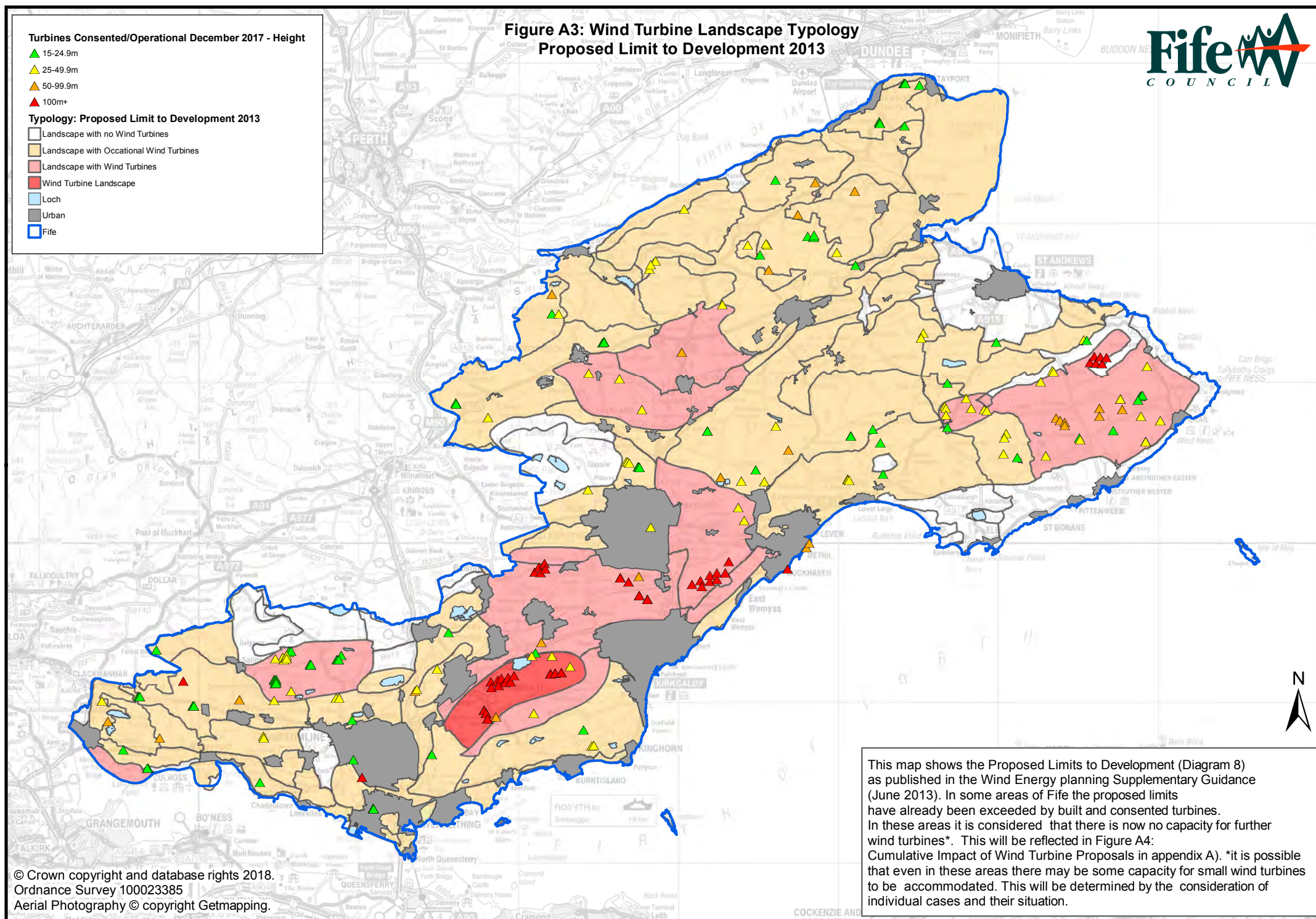
**Figure A3: Wind Turbine Landscape Typology
Proposed Limit to Development 2013**

Turbines Consented/Operational December 2017 - Height

- ▲ 15-24.9m
- ▲ 25-49.9m
- ▲ 50-99.9m
- ▲ 100m+







Typology: Proposed Limit to Development 2013

- Landscape with no Wind Turbines
- Landscape with Occasional Wind Turbines
- Landscape with Wind Turbines
- Wind Turbine Landscape
- Loch
- Urban
- Fife



This map shows the Proposed Limits to Development (Diagram 8) as published in the Wind Energy planning Supplementary Guidance (June 2013). In some areas of Fife the proposed limits have already been exceeded by built and consented turbines. In these areas it is considered that there is now no capacity for further wind turbines*. This will be reflected in Figure A4: Cumulative Impact of Wind Turbine Proposals in appendix A). *it is possible that even in these areas there may be some capacity for small wind turbines to be accommodated. This will be determined by the consideration of individual cases and their situation.

Figure A4: Cumulative Impact of Wind Turbine Proposals

-  Areas with no capacity
-  Areas where cumulative impact limits further development
-  Areas where cumulative impact has been reached/breached
-  Loch
-  Urban
-  Fife

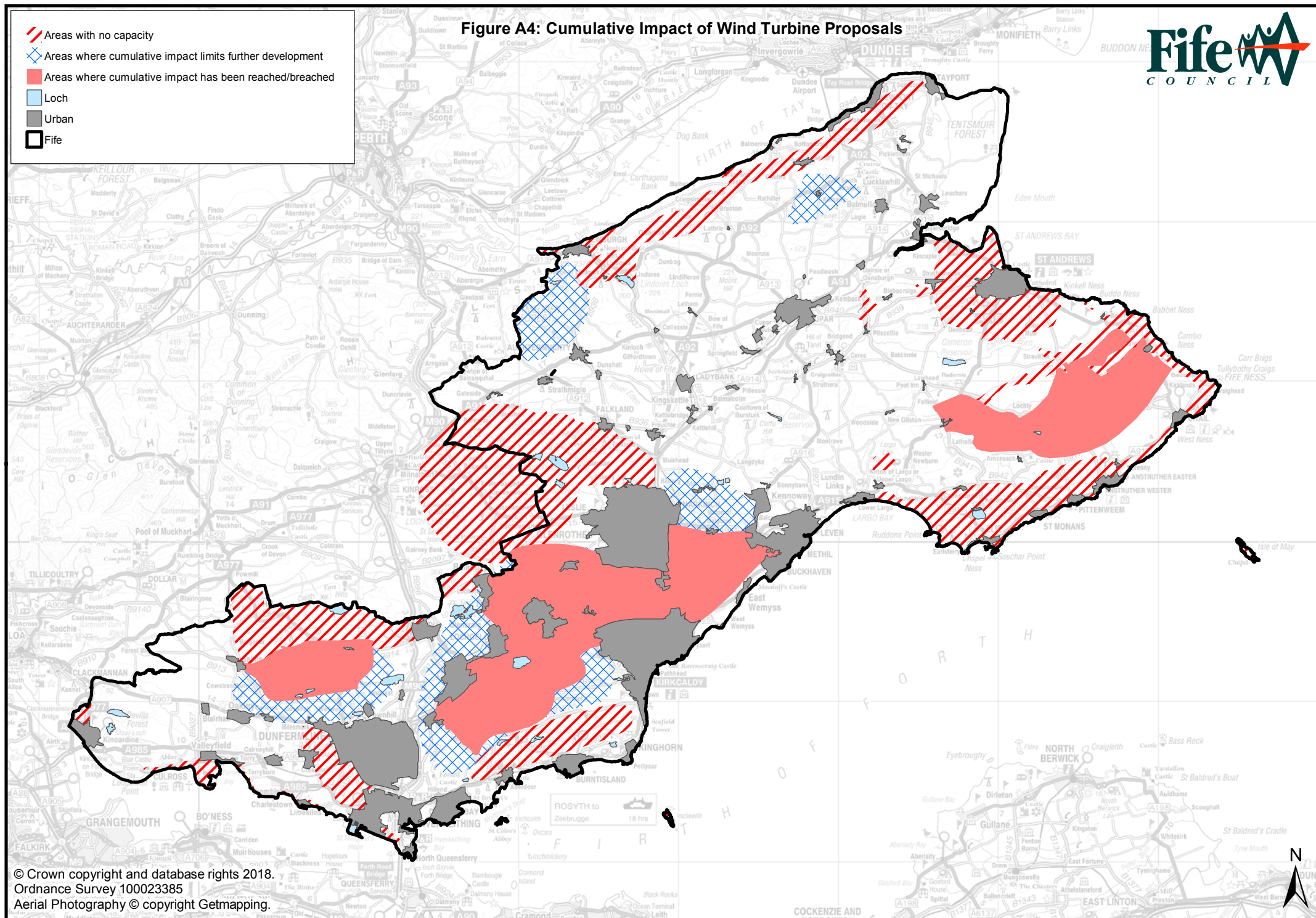


Table A1: Areas where cumulative impact limits further development and where the acceptable cumulative impact has been reached (see figure A4)

Description and Key Objectives: See figure’s A2 and A3

The development situations outlined below do not take into account any built or consented wind turbines under 25m height which are in the area apart from in the Cleish Hills area north of Dunfermline where there are a high number of small turbines built or consented.

Lowland Areas between Leven, Kirkcaldy and Dunfermline	
<p>Description</p> <p>The boundaries of this area include:</p> <ul style="list-style-type: none">• The <i>Lowland Hills and Valleys</i> between Leven, Kirkcaldy, Glenrothes, Kelty, Dunfermline and Inverkeithing;• The northern edge of the Cullaloe Hills <i>Prominent Volcanic Hills and Craigs</i> between Kirkcaldy and Inverkeithing;• The southern edges <i>Prominent Volcanic Hills and Craigs</i> including Hill of Beith west of Cowdenbeath and the area west of Glenrothes;• The <i>Lowland Loch Basins</i> of Lochs Ore, Gelly and Fitty;• The <i>Coastal Hills</i> between Kirkcaldy and Leven;• The Vale of Leven between Glenrothes and Leven.	<p>Development Situation and Key Objectives</p> <p>33 very large turbines, 3 large turbines and 5 medium size turbines are operational or consented in this area - creating a <i>Wind Turbine Landscape</i> around Mossmorran and between Kirkcaldy and Glenrothes to Earlseat which extends into the <i>Pronounced Volcanic Hills and Craigs</i> character area to the west of Glenrothes. This exceeds the proposed limit to development for wind turbines identified on figure A3 for much of this area; Cumulative impact is therefore cosndiered to have been reached for much of this land. There is also a knock on impact on some of the surrounding landscapes where it is considered that the cumulative impact limits further development.</p> <p>The objectives governing future wind turbine development in the area are:</p> <ol style="list-style-type: none">1) To prevent any further turbine development in areas where consented development has occupied inherent capacity: the area surrounding Mossmorran (between Cowdenbeath/ Lochgelly and the Cullaloe Hills) and between Westfield Opencast Site and East Wemyss, including Strathore between Glenrothes and Kirkcaldy. 2018 update: there have been quite a number of additional very large and large wind turbines built in the area particularly around Mossmorran and along Strathore Road to the south of Glenrothes. These have exceeded the proposed maximum capacity of the landscape identified in the Fife Strategic Cumulative Impact Assessment in places by creating localised areas of <i>Wind Turbine Landscape</i>.2) Retaining sufficient spacing between individual windfarms and turbines to maintain the <i>Landscape with Wind Turbines</i> character and avoid the <i>Wind Turbine Landscape</i> character in <i>Lowland Hills and Valleys</i> and <i>Lowland River Basins</i>; 2016 update: need to avoid the areas identified as now being a <i>Wind Turbine Landscape</i> from extending further.3) To prevent unacceptable effects of larger wind turbines on landscape character areas with limited capacity including <i>Pronounced Volcanic Hills and Craigs</i>, <i>Lowland Loch Basins</i> and <i>Coastal Hills</i>;4) To support an organised pattern of development by maintaining sufficient spacing/ screening between groups of larger and smaller turbines; 2016 update: need to avoid further infilling of the spaces between the larger clusters of turbines.5) To prevent unacceptable proximity of larger turbines to settlements and other visually sensitive locations.
Cleish Hills and Foothills north of Dunfermline	
<p>Description</p> <p>The boundaries of this area include:</p> <ul style="list-style-type: none">• The Cleish <i>Upland Foothills</i> in which several existing, consented and proposed turbines are located;• The Cleish Hills <i>Uplands</i> and <i>Upland Slopes</i> to the north, east and west;• Loch Fitty <i>Lowland Loch Basin</i> to the east;• <i>Lowland Hills and Valleys</i> along the northern edge of Dunfermline, the Dunfermline green belt and villages to the west of Dunfermline.	<p>Development Situation and Key Objectives</p> <p>Currently this area has four clusters of small turbines, a cluster of 6 medium size turbines and 4 other medium turbines, 3 other medium turbines – all operational, and consent for a large turbine at Muirside of Kinnedar; creating a <i>Landscape with Wind Turbines</i>. The northern part of this area (the <i>Upland Foothills</i> character area) is close to becoming a <i>Wind Turbine Landscape</i>; it is therefore considered that the acceptable cumulative impact of wind turbines has been reached in this area for clusters of more than 2 small turbines and turbines of 25m and over.</p> <p>The objectives governing future wind turbine development in the area are:</p> <ol style="list-style-type: none">1) Retaining sufficient spacing between individual groups of turbines to maintain a <i>Landscape with Wind Turbines</i> and avoid a <i>Wind Turbine Landscape</i> character in the Cleish Foothills;2) Avoiding close proximity of larger wind turbines to the Cleish Hills ridgeline which forms an important but modestly scaled backdrop to the area;3) To support an organised pattern of development by maintaining sufficient spacing/ screening between groups of larger and smaller turbines;4) To prevent unacceptable proximity of larger turbines to settlements and other visually sensitive locations including the Dunfermline conservation area. 2016 update: proximity of large consented turbine north of Oakley (54.7m to tip) is not considered to be unacceptable given the scale of the turbine (only just larger than medium scale) and topography of the area.

Pitmedden	
<p>Description</p> <p>The boundaries of this area include:</p> <ul style="list-style-type: none">• The <i>Uplands</i> area;• The western and northern part of the adjacent <i>Upland Foothills</i> area;• The <i>Lowland Hills and Valleys</i> slopes north of Strathmiglo and Auchtermuchty.	<p>Development Situation and Key Objectives</p> <p>Currently this area has 2 medium turbines and a large turbine which are operational. The cumulative impact of these turbines is considered to limit further wind turbine development in this area.</p> <p>The objectives governing future wind turbine development in the area are:</p> <ol style="list-style-type: none">1) Preventing the <i>Uplands</i> and <i>Upland Foothills</i> areas from becoming a <i>Landscape with Wind Turbines</i>2) Avoiding highly visible skyline effects on the crests of <i>Uplands</i> and <i>Upland Foothills</i> areas;3) To support an organised pattern of development by maintaining sufficient spacing/ screening between larger and smaller turbines;4) To prevent unacceptable proximity of larger turbines to settlements and other visually sensitive locations.
East Neuk	
<p>Description</p> <p>The boundaries of this area include:</p> <ul style="list-style-type: none">• The <i>Lowland Open Sloping Farmlands</i> area;• The <i>Lowland Dens</i> Kinaldy LCU north of Lingo• The central part of the adjacent <i>Volcanic Hills and Craigs</i> area around Largoward and Kellie Law;	<p>Development Situation and Key Objectives</p> <p>Currently this area has:</p> <p>6 very large turbines consented at Kenly on the edge of the Kinaldy Den and 6 built large turbines at Bonerbo and Airdie within the <i>Lowland Open Sloping Farmland</i> area. These have created a <i>Wind Turbine Landscape area</i> which means that the capacity for this area to accommodate wind turbines has been exceeded.</p> <p>14 built and one consented medium turbines in groups of one or two across the area. Most of these are in the <i>Pronounced Volcanic Hills and Craigs</i> area. These have created a <i>Landscape with Wind Turbines</i> in this area.</p> <p>The objectives governing future wind turbine development in the area are:</p> <ol style="list-style-type: none">1) Preventing a <i>Landscape with Wind Turbines</i> type spreading across the <i>Lowland Open Sloping Farmland</i> into the neighbouring <i>Pronounced Volcanic Hills and Craigs</i> and <i>Lowland Dens</i> areas. 2018 update: It is considered that the <i>landscape with wind turbines</i> typology has extended into the Pronounced Volcanic Hills and Craigs area – exceeding identified maximum capacity for this area, Therefore this is now identified as an area where the acceptable cumulative impacts have been reached.2) Ensuring that further wind energy developments in the <i>Lowland Open Sloping Farmland</i> do not exceed a <i>Landscape with Wind Turbines</i>. 2017 update: Capacity is being reached in some areas in particular for large turbines, still capacity for small and medium turbines depending on the vicinity of other turbines and the local topography.3) To prevent unacceptable proximity of larger turbines to sensitive landscape or visual receptors such as Kellie Law or Kellie Castle; 2017 update: Kenly wind farm proposal will impact on sensitive landscapes along the Fife coast around Kingsbarns and at Kinaldy Den. No unacceptable impacts to Kellie law or Kellie Castle to date.
Lucklaw Hills	
<p>Description</p> <p>The boundaries of this area include:</p> <ul style="list-style-type: none">• The northern part of the <i>Upland Foothills</i> area at Lucklaw Hills• The far western part of the <i>Lower Glacial Meltwater Valley</i> along the A92 towards the Tay Bridgehead• Northern section of the <i>Lowland Hills and Valleys</i> by Kilmany	<p>Development Situation and Key Objectives</p> <p>Currently this area has:</p> <p>Three large single turbines that have been constructed, all are clearly visible from the A92 corridor. This area is considered in danger of becoming a <i>Landscape with wind turbines</i> as a result the cumulative impact of these turbines is considered to limit further wind turbine development.</p> <p>The objectives governing future wind turbine development in the area are:</p> <ol style="list-style-type: none">1) Prevent the A92 corridor from becoming a <i>Landscape with Wind Turbines</i>

Table A2. Summary of landscape capacity, cumulative effects and guidance for wind energy development (See Figure's 1 and 2 and Appendix A for Maps)

LANDSCAPE TYPE / UNIT	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	LANDSCAPE CAPACITY (Related to turbine size)			WIND TURBINE LANDSCAPE TYPES		GUIDANCE: Turbine Sizes Max. Numbers in Group Min Group Separation Distances	GUIDANCE: Landscape Analysis and Comment on Currently Consented and Proposed Turbines
					M	L	VL	Consented	Proposed Limits to Development		
Key: <div><div></div> No Capacity</div> <div><div></div> Low Capacity</div> <div><div></div> Medium Capacity</div> <div><div></div> High Capacity</div> Turbine Sizes: M = Medium (25- <50m); L = Large (50- <100m); VL = Very Large (100m+)											
Volcanic Uplands of the Midland Valley											
1. The Uplands (FFE1)	Medium/ High	High	High	Medium/ High	<div></div>	<div></div>	<div></div>	Uplands with no Wind Turbines	Uplands with no Wind Turbines	No turbines	Landscape Analysis: Most <i>Uplands</i> are relatively limited in area, open sloped, visually prominent within Fife and visible from distant locations as horizon features. Any turbine development would be prominent. These areas should be retained as a landscape with no turbines to provide spaces between surrounding lower areas with turbine development. Existing, Consented and Proposed Turbines: No current consents or proposed applications in Lomond, or Benarty Hills.
<i>Pitmedden LCU</i>	Medium	Medium/ High	Medium/ High	Medium	<div></div>	<div></div>	<div></div>	Uplands with Occasional Wind Turbines	Uplands with Occasional Wind Turbines	Turbine Sizes: 25-50m; 50-100m Group Sizes: 1-3 (medium), 1 (large). Separation Distances: 2-5km (medium); 4-8km (large)	Landscape Analysis: Pitmedden is less distinctive than other <i>Upland</i> LCUs, with extensive forestry and is part of the Ochils, a larger range that extends west of Fife into Perth & Kinross. Could accommodate limited further development of medium turbines in clusters of 1-3 or a single large turbine. Turbines should be in association with existing buildings, pylons and backclothed by higher ground and/or trees. Existing, Consented and Proposed Turbines: Two existing medium turbines near farm buildings and one large turbine 2km north of this are within capacity. This is now an area where the cumulative impact limits further development. Proposals for additional turbines immediately south of the LCU have previously been refused as it was considered they exceeded the capacity of the landscape.
2. Upland Slopes (FFE2)	Medium/ High	High	High	Medium/ High	<div></div>	<div></div>	<div></div>	Upland Slopes with no Wind Turbines/ Occasional Wind Turbines	Upland Slopes with no Wind Turbines/ Occasional Wind Turbines	No turbines	Landscape Analysis: Most slope LCUs are integral with the landforms and character of the Uplands. Visually prominent and facing out from the hill ranges so very visible. Same guidance as for the Uplands LCU. Existing, Consented and Proposed Turbines: Three medium and three small turbine existing on the east side of the Lomond Hills. One small turbine on Cults Hill which is pending consideration.
3. Upland Foothills (FFE3)	Medium/ High	Medium/ High	Medium/ High	Medium/ High	<div></div>	<div></div>	<div></div>	Upland Foothills with no Wind Turbines/ Occasional Wind Turbines	Upland Foothills with Occasional Wind Turbines	Turbine Sizes: 25-50m Group Sizes: 1-3 Separation Distances: 3-6km	Landscape Analysis: Most Upland Foothill LCUs are a visually prominent backdrop to lowland and coastal areas especially in north above Firth of Tay. Potential for very occasional small groups or single medium turbines sited in less prominent areas with landform/ tree backclothing. Discourage development of turbines on prominent ridge/ summit locations, particularly on skyline above Firth of Tay. Existing, Consented and Proposed Turbines: One medium turbine built to the west of Leslie. Several small and medium turbines built and consented within or adjacent to the northern LCUs – capacity not exceeded in these areas. Capacity is being reached in the area around Kilmany – there is one large turbine built on the northern slope of Lucklaw Hill and one the opposite side of the A92 on Round Hill – with consent for another large turbine on Darklaw Hill.

LANDSCAPE TYPE / UNIT	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	LANDSCAPE CAPACITY (Related to turbine size)			WIND TURBINE LANDSCAPE TYPES		GUIDANCE: Turbine Sizes Max. Numbers in Group Min Group Separation Distances	GUIDANCE: Landscape Analysis and Comment on Currently Consented and Proposed Turbines
					M	L	VL	Consented	Proposed Limits to Development		
Key: <div><div></div> No Capacity</div> <div><div></div> Low Capacity</div> <div><div></div> Medium Capacity</div> <div><div></div> High Capacity</div> Turbine Sizes: M = Medium (25- <50m); L = Large (50- <100m); VL = Very Large (100m+)											
<i>Cleish Foothills LCU</i>	Medium	Medium/ High	Medium	Medium	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<i>Upland Foothills with Wind Turbines</i>	<i>Upland Foothills with Wind Turbines</i>	Turbine Sizes: 25-50m Group Sizes: 1-5 Separation Distances: 2-5km	Landscape Analysis: Cleish Foothills are backclothed by the main hills and have a more developed character and less sensitive location than the northern foothill areas. This includes current turbine development described below. Cleish Hills Uplands are a sensitive backdrop of relatively modest scale. No capacity for large or very large turbines, and only small turbines should be allowed in close proximity to the Uplands. Existing, Consented and Proposed Turbines: Several existing clusters of small and medium turbines are noticeable mainly at close proximity. Capacity of the LCU is considered to have generally been reached for this area (some capacity remains for small turbines in groups of no more than 2. Allow adequate separation between turbines of different sizes.
4. Pronounced Volcanic Hills and Craigs (FFE4)	Medium	Medium/ High	Medium/ High	Medium/ High	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<i>PVHC with Occasional Wind turbines/ With Wind Turbines/ no Wind Turbines</i>	<i>PVHC with Occasional Wind Turbines/ With Wind Turbines/ no Wind Turbines</i>	Turbine Sizes: 25-50m; 50-100m Group Sizes: 1-3 (medium) and 1 (large). Separation Distances: 3-6km (medium); 8-12km (large)	Landscape Analysis: Very varied landscape with prominent irregularly spaced landforms. Cullaloe Hills unit is a backdrop to coastal settlements opposite Edinburgh. The type should be limited predominantly to a <i>Landscape with Occasional Wind Turbines</i> . Most developments should be medium turbines with only very occasional large turbines. Discourage close proximity of large turbines to the most prominent landforms and any turbines on summits of prominent landforms. Avoid southern part of Cullaloe Hills unit opposite Edinburgh. Existing, Consented and Proposed Turbines: North East Fife: Current development across most of this area is limited to occasional single/ paired small or medium turbines, with two large turbines located north of Kennoway. Predominantly <i>PVHC with Occasional Wind Turbines</i> . However there are areas of <i>PVHC with Wind Turbines</i> : <ul style="list-style-type: none">Several medium turbines clustered around Largoward in the East Neuk Landward area - capacity for further turbines has been reached from Largoward to Kellie Law. Elsewhere in this area capacity is limited but some remains particularly for small turbines. Capacity will depend on the particular landscape conditions and existing turbines in the vicinity. Central Fife: Current development to the north of the Cullaloe Hills limits further development and in some places the acceptable capacity has been met. <ul style="list-style-type: none">Very large turbines on the edge of two LCUs adversely affect this type: at Westfield OOCs west of Glenrothes and Clentrie Farm on northern edge of Cullaloe Hills.Two other medium turbines and one small turbine consented to the north-east of Burntisland.One medium turbine built at Kirkton of Beath Farm to the west of Cowdenbeath.
<i>Largo Law, Elie LCUs</i>	Medium	Medium/ High	Medium/ High	Medium/ High	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<i>PVHC with No Wind turbines</i>	<i>PVHC with No Wind turbines</i>	No turbines	Landscape Analysis: These small isolated units within other landscape types will have no capacity due to limited extent and local prominence.

LANDSCAPE TYPE / UNIT	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	LANDSCAPE CAPACITY (Related to turbine size)			WIND TURBINE LANDSCAPE TYPES		GUIDANCE: Turbine Sizes Max. Numbers in Group Min Group Separation Distances	GUIDANCE: Landscape Analysis and Comment on Currently Consented and Proposed Turbines
					M	L	VL	Consented	Proposed Limits to Development		
Key: No Capacity Low Capacity Medium Capacity High Capacity Turbine Sizes: M = Medium (25- <50m); L = Large (50- <100m); VL = Very Large (100m+)											
<h3>Summary of Capacity and Cumulative Development in the Volcanic Uplands of the Midland Valley</h3> <p>The Volcanic Uplands comprise 4 landscape types: <i>The Uplands</i>; <i>Upland Slopes</i>; <i>Upland Foothills</i> and <i>Pronounced Volcanic Hills and Craigs</i>.</p> <p>The Volcanic Upland landscape types in Fife have varied but generally limited capacity for wind turbine development. Most of the highest <i>Uplands</i> (FFE1) and the <i>Upland Slopes</i> (FFE2) have no capacity. This is because they are limited in area within Fife, visually distinctive in landform, with prominent skylines often visible from a distance and surrounded by lowlands with sensitive visual receptors. The Pitmedden area in the north is less distinctive and not prominent and therefore has some limited capacity. This has been limited still further by the construction of one large and two medium turbines in the area.</p> <p>The <i>Upland Foothills</i> (FFE3) are more extensive in area and more complex and varied in form and pattern but also highly visually sensitive in places where they form distinctive horizons. These areas have a low capacity for development up to a medium size of turbine. The <i>Pronounced Volcanic Hills and Craigs</i> (FFE4) have the lowest elevation but are of a similar medium/large scale with a simpler landform over much of their area. They have the highest landscape capacity of the upland landscape types, although this is still limited. The area around Largoward has now reached capacity.</p> <p>Current development largely reflects increasing capacity as landform lowers. With the exception of the Pitmedden area and East Lomond slopes area there is no turbine development in the <i>Uplands</i> and <i>Upland Slopes</i>. There are a few small turbines in the <i>Upland Foothills</i> along the northern edge of Fife, but several clusters of small and medium turbines in the Cleish Foothills, and the development of two large turbines on the Lucklaw Hills south of Kilmany limits the capacity in this area. There is scattered development of single small or medium turbines through much of the <i>Pronounced Volcanic Hills and Craigs</i> but extensive areas remain empty of turbines. The capacity reached area and three limited areas within this type are affected by a higher density/size of development.</p> <p>The very limited capacity in the majority of <i>Uplands</i> and <i>Upland Slopes</i> and on the crests of some <i>Upland Foothills</i> and <i>Pronounced Volcanic Hills and Craigs</i> amounts to significant areas that should not be developed for wind energy. Undeveloped areas would also provide gaps between the surrounding lower landscape areas that have more capacity for development, retaining landscape diversity in Fife. Development in the remaining areas of <i>Uplands</i>, <i>Upland Foothills</i> and <i>Pronounced Volcanic Hills and Craigs</i> should not exceed a <i>Landscape with Occasional Wind Turbines</i> (refer to figure A3). To stay within this type it would be possible only to accommodate small clusters of medium size and very occasional single larger turbines. The exception to this is the Cleish Foothills where the more developed landscape has the capacity to accommodate a <i>Landscape with Wind Turbines</i>, but with restrictions on turbine size and avoiding close proximity to the modestly elevated Cleish Hills skyline. Much of this capacity has already been taken up by the consented turbines.</p> <p>There are current proposals for a few turbines which are predominantly medium size. These would be largely accommodated in this framework in the <i>Uplands</i>, and <i>Upland Foothills</i> and across most areas of <i>Pronounced Volcanic Hills and Craigs</i>. However there are locations where very large turbines are proposed on the boundaries of these areas which limit the capacity.</p>											

LANDSCAPE TYPE / UNIT	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	LANDSCAPE CAPACITY (Related to turbine size)			WIND TURBINE LANDSCAPE TYPES		GUIDANCE: Turbine Sizes Max. Numbers in Group Min Group Separation Distances	GUIDANCE: Landscape Analysis and Comment on Currently Consented and Proposed Turbines
					M	L	VL	Consented	Proposed Limits to Development		
Key: <div><div></div> No Capacity</div> <div><div></div> Low Capacity</div> <div><div></div> Medium Capacity</div> <div><div></div> High Capacity</div> Turbine Sizes: M = Medium (25- <50m); L = Large (50- <100m); VL = Very Large (100m+)											
Midland Valley Lowland Landscapes											
5. Lowland Hills and Valleys (FFE5)											Landscape Analysis: The most extensive lowland type, with the largest area stretching from Kincardine, through Dunfermline to Glenrothes. Smaller areas to the north and east. These areas merge with other lowland and coastal LCTs and are contained by modest height upland landscapes.
Cowdenbeath, Glenrothes, Kirkcaldy LCU	Medium/ Low	Medium/ High	Medium	Medium/ Low	<div></div>	<div></div>	<div></div>	LHV with Wind Turbines/ Wind Turbines in LHV (Mossmorran area)	LHV with Wind Turbines / Wind turbines in LHV (Mossmorran Area)	Turbine Sizes: 25-50m; 50-100m; 100m+ Group Sizes: 1-5 (medium, large and very large). Separation Distances: 3-5km (medium); 5-10km (large and very large)	Medium/ large scale, simple rolling/ undulating landform and large field pattern can accommodate larger wind turbines but not large windfarms or extended turbine clusters. The LCUs vary in context with these areas having several large towns and industrial infrastructure which gives a logical context to energy generating infrastructure. Existing, Consented and Proposed Turbines: Several operational windfarms with very large turbines within Glenrothes/ Cowdenbeath LCU: Little Raith (9x125m); Westfield (5x110m), Mossmorran (3x100m); Earlseat Farm in Vale of Leven (8x125m), 3 x 100m turbines at Clentrie Farm, a large turbine at Mossmorran land a large turbine to the south of Cardenden. Four very large and one large turbine operational in Strathore south of Glenrothes. Further operational and consented medium turbines in this area. Current operational and consented turbines have created Wind Turbine Landscapes around Mossmorran and south of Glenrothes to Earlseat. Proximity of turbines to one another, to settlements and other more sensitive LCTs need to be considered in any further applications. The capacity between Glenrothes and Kirkcaldy is considered to have been exceeded
Dunfermline – Kincardine LCUs	Medium	Medium/ High	Medium	Medium	<div></div>	<div></div>	<div></div>	LHV with Occasional Wind Turbines or no Wind Turbines	LHV with Occasional Wind Turbines	Turbine Sizes: 25-50m; 50-100m Group Sizes: 1-5 (medium and large). Separation Distances: 3-5km (medium); 5-10km (large)	Landscape Analysis: These LCUs have a higher visual sensitivity being visible from across Firth of Forth between the coast and Cleish Hills. Areas to W of Dunfermline partly in green belt. No further development in green belt to west of Dunfermline in order to protect setting of town. Very large turbines (100m+) would be too large for these areas. Existing, Consented and Proposed Turbines: One very large turbine consented at Lockshaw Moss. Large single turbines operational to the east (Tulliallan Concrete Works) and west (Gallowridge) of Devilla Forest. Consent for a large turbine at Muirside of Kinnedar and a large turbine to the west of the M90 south of Cuddyhouse Road. There are a few other small and medium operational or consented turbines within or adjacent to this area. One very large turbine operational at Pitreavie and small turbine at Dunfermline High School adjacent to LCU west of Dunfermline. A proposal for two very large turbines to the east of Junction 2a on the M90 is pending consideration.

LANDSCAPE TYPE / UNIT	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	LANDSCAPE CAPACITY (Related to turbine size)			WIND TURBINE LANDSCAPE TYPES		GUIDANCE: Turbine Sizes Max. Numbers in Group Min Group Separation Distances	GUIDANCE: Landscape Analysis and Comment on Currently Consented and Proposed Turbines
					M	L	VL	Consented	Proposed Limits to Development		
Key: <div><div></div> No Capacity</div> <div><div></div> Low Capacity</div> <div><div></div> Medium Capacity</div> <div><div></div> High Capacity</div> Turbine Sizes: M = Medium (25- <50m); L = Large (50- <100m); VL = Very Large (100m+)											
<i>Auchtermuchty and Cupar</i>	Medium	Medium/ High	Medium	Medium	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<i>LHV with Occasional Wind Turbines or no Wind Turbines</i>	<i>LHV with Occasional Wind Turbines</i>	Turbine Sizes: 25-50m; 50-100m Group Sizes: 1-5 (medium and large). Separation Distances: 4-6km (medium); 6-12km (large)	Landscape Analysis: LCUs in the north and east are smaller in extent and have a much more rural context, close to areas of higher landscape sensitivity. Should not be developed beyond <i>Occasional Wind Turbines</i> type. Very large turbines (100m+) unsuitable. Existing, Consented and Proposed Turbines: Currently no windfarm proposals but a handful of small and medium size turbines in small clusters or singly operational in the area. One consented large turbine north of Cupar at Pitbladdo.
<i>St Andrews</i>	Medium	Medium/ High	Medium/ High	Medium	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<i>LHV with Occasional Wind Turbines / No Wind Turbines</i>	<i>LHV with Occasional Wind Turbines / No Wind Turbines</i>	Turbine Sizes: 25-50m; 50-100m Group Sizes: 1-3 (medium) and 1 (large). Separation Distances: 3-6km (medium); 8-12km (large)	Landscape Analysis: The LCUs to the south of St Andrews are smaller in extent and have a much more rural context, close to areas of higher landscape sensitivity (<i>St Andrews Greenbelt</i> and <i>Lowland Dens</i>). Should not be developed beyond <i>Occasional Wind Turbines</i> type. Very large turbines (100m+) unsuitable. Part of units to S of St Andrews lie within green belt – no turbines should be located in this area in order to protect setting of town. Existing, Consented and Proposed Turbines: A few small and medium size turbines in small clusters or singly in or adjacent to this area do not exceed capacity. The consented Kenly wind farm will have a visual impact on the area to the west of Boarhills.
6. Lowland Open Sloping Farmland (FFE6)	Medium/ Low	Medium	Medium	Medium/ Low	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	<i>LOSF with Wind Turbines /with Occasional Wind Turbines</i>	<i>LOSF with Wind Turbines</i>	Turbine Sizes: 25-50m; 50-100m Group Sizes: 1-5(medium and large). Separation Distances: 3-5km (medium); 5-10km (large)	Landscape Analysis: Gently undulating/ flat landform and simple landscape pattern would accommodate small clusters of large turbines. Capacity for largest turbines limited by: <ul style="list-style-type: none">Proximity to sensitive locations (neighbouring more sensitive LCTs and smaller scale features, residential properties).Effects on skyline seen from sensitive locations.Potential cumulative effects/ capacity issues with turbines in adjacent <i>Volcanic Hills and Craigs</i> area. Existing, Consented and Proposed Turbines: Four large turbines at Bonerbo, two large turbines at Airdrie Farm, Lochton operational. Consent for six very large (100m) turbines adjacent to a sensitive Lowland Dens LCU at Kenly Wind farm. There are several operational small and medium turbines scattered across the area: Muirhead Farm – 1 medium turbine; Kirkmay Farm – 1 medium turbine; Barnsmuir farm, Anstruther – 1 medium turbine; Cambo – 1 medium turbine; Scotshall Farm, Ovenstone – 1 medium turbine; Balhouffie – one small and one medium turbines; Lochton Farm – 4 turbines; Brake Farm, Dunino – small turbine; West Pitcorthie Farm - 1 small turbine

LANDSCAPE TYPE / UNIT	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	LANDSCAPE CAPACITY (Related to turbine size)			WIND TURBINE LANDSCAPE TYPES		GUIDANCE: Turbine Sizes Max. Numbers in Group Min Group Separation Distances	GUIDANCE: Landscape Analysis and Comment on Currently Consented and Proposed Turbines
					M	L	VL	Consented	Proposed Limits to Development		
Key: <div><div></div> No Capacity</div> <div><div></div> Low Capacity</div> <div><div></div> Medium Capacity</div> <div><div></div> High Capacity</div> Turbine Sizes: M = Medium (25- <50m); L = Large (50- <100m); VL = Very Large (100m+)											
											<p>Two medium (27m) turbines have been built at Beley Farm, Dunino , this is within the sensitive Lowland Dens LCU but adjacent to FFE6 LCU</p> <p>Consents granted on appeal for large (67m) turbine at Muirhead Farm, and Medium (45.1m) turbine at Leys Farm, Lochton.</p> <p>Within the area identified as landscape with wind turbines the capacity for large turbines is considered to have been met*, there is still some capacity of medium and low turbines within this area. There is still some capacity for large turbines within the areas still identified as being an occasional wind turbine landscape.</p>
7. Lowland Dens (FFE7)	High	Medium/ Low	Medium/ High	Medium/ High	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	Lowland Dens with no Wind Turbines	Lowland Dens with no Wind Turbines	No Turbines	<p>Landscape Analysis: small scale enclosed landscapes with no capacity for turbines over 25m and generally unsuitable due to sheltered location.</p> <p>Existing, Consented and Proposed Turbines:</p> <p>Kinaldy Dens:</p> <p>Two medium turbines built at Beley Farm, Dunino within this LUC.</p> <p>There is an operational medium turbine at Brake Farm on the southern boundary of the LUC and one small turbine built and two small turbines consented at Peekie on the northern boundary of this LUC.</p> <p>Six very large turbines at Kenly consented adjacent to Kinaldy Dens, S of St Andrews. Located in neighbouring <i>Lowland Open Sloping Farmland</i> but will exceed landscape capacity of the Dens.</p> <p>Corbie Den:</p> <p>There are no built or consented turbines within or close to this LUC.</p>
Largo LCU	Medium	Medium	Medium	Medium/ High	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	Lowland Dens with no Wind Turbines	Lowland Dens with Occasional wind Turbines	Turbine Sizes: 25-50m Group Sizes: 1-3 Separation Distances: 4-6km	<p>Landscape Analysis: The unit N of Largo comprises a mixture of Dens and farmland. Would have capacity for occasional medium turbines in farmland areas, avoiding proximity to Dens and Largo Law.</p> <p>Existing, Consented and Proposed Turbines: currently two small and three medium turbines operational. Some small, several medium and one large turbine consented or operational adjacent to the LCU.</p>
8. Lowland Glacial Meltwater Valleys (FFE8)	Medium/ High	Medium	Medium/ High	Medium	<div><div></div></div>	<div><div></div></div>	<div><div></div></div>	LGMV with no Wind Turbines	LGMV with Occasional Wind Turbines	Turbine Sizes: 25-50m Group Sizes: 1-3 Separation Distances: 3-5km	<p>Landscape Analysis: Limited capacity mainly in more open areas. Turbine heights should not exceed 50m due to modest height of enclosing <i>Upland Foothills</i> slopes. Narrowest areas should not be developed.</p> <p>Existing, Consented and Proposed Turbines: Two medium turbines consented and one operational at Glenduckie, One small turbine at Easter Friarto, nr Drumoig.</p> <p>There are 3 large turbines operational around Kilmany. These limit the capacity for additional turbines in the surrounding area.</p>

LANDSCAPE TYPE / UNIT	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	LANDSCAPE CAPACITY (Related to turbine size)			WIND TURBINE LANDSCAPE TYPES		GUIDANCE: Turbine Sizes Max. Numbers in Group Min Group Separation Distances	GUIDANCE: Landscape Analysis and Comment on Currently Consented and Proposed Turbines
					M	L	VL	Consented	Proposed Limits to Development		
Key: <div><div></div> No Capacity</div> <div><div></div> Low Capacity</div> <div><div></div> Medium Capacity</div> <div><div></div> High Capacity</div> Turbine Sizes: M = Medium (25- <50m); L = Large (50- <100m); VL = Very Large (100m+)											
9. Lowland River Basin (FFE9) Vale of Leven	Medium/ Low	Medium/ High	Medium	Medium/ Low	<div></div>	<div></div>	<div></div>	LRB with Occasional Wind Turbines / Wind Turbine Landscape (in the south)/ Wind Turbines Landscape (around Earlseat)	LRB with Wind Turbines	Turbine Sizes: 25-50m, 50-100m; 100m+ Group Sizes: 1-5 (all sizes). Separation Distances: 3-5km (medium); 5-10km (large and very large)	Landscape Analysis: Open lowland landscape with simple sloping/flat landform and large scale fields in simple pattern merging with Coastal Hills and Lowland Hills and Valleys and surrounded on 3 sides by significant settlements. Has a similar capacity for wind energy development to the LHV. Existing, Consented and Proposed Turbines: Operational - 8 very large turbines at Earlseat Farm, Vale of Leven and one very large turbine at Woodbank Farm, this is close to the 8 turbines at Earlseat and has been designed to read as part of the existing wind farm. One operational medium size turbine near Kennoway. There is consent for a medium turbine (25m) at Balcurvie, Windygates. There should be no further development of large or very large scale turbines in Vale of Leven as capacity in southern part has already been exceeded with this area becoming a Wind Turbine Landscape. Use lower size turbines in areas with close proximity to settlements, conservation areas and Upland landscape types. There is a large turbine and several small and medium turbines within and adjacent to the LCU near Star, these make the area a landscape with occasional wind turbines.
Howe of Fife	Medium/ Low	Medium/ High	Medium	Medium/ Low	<div></div>	<div></div>	<div></div>	LRB with Occasional Wind Turbines	LRB with Wind Turbines	Turbine Sizes: 25-50m, 50-100m Group Sizes: 1-5 (all sizes). Separation Distances: 3-5km (medium); 5-10km (large)	Landscape Analysis: Flatter than Vale of Leven with less influence of nearby settlement. Merges with surrounding areas of Lowland Hills and Valleys and has a slightly higher capacity for wind energy development than these due to scale and simplicity of the landscape. Turbines should be limited to 100m height due to proximity of sensitive designated landscapes (Lomond Hills) and conservation areas (Falkland, Strathmiglo and Auchtermuchty). Existing, Consented and Proposed Turbines: Currently 7 medium size turbines and one large turbine operational in or near Howe of Fife. Further development in Howe of Fife near current consented turbines should respect their size.
10. Lowland Loch Basin (FFE10)	Medium	Medium/ High	Medium/ High	Medium/ High	<div></div>	<div></div>	<div></div>	LLB with Wind Turbines (Loch Gelly) LLB with no Wind Turbines	LLB with Wind Turbines (Loch Gelly) LLB with Occasional Wind Turbines	Turbine Sizes: 25-50m Group Sizes: 1-3 Separation Distances: 3-5km	Landscape Analysis: Limited area focused around loch merging into surrounding more extensive lowland and upland landscapes. Existing, Consented and Proposed Turbines: Loch Gelly - 9 adjacent very large wind turbines at Little Raith and three at Clentrie Farm within 2km plus one medium and a small turbine close to LCU to the east; significantly affect this area. No other areas currently affected but all have limited capacity. Further development should be limited to well-separated medium size turbines.

LANDSCAPE TYPE / UNIT	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	LANDSCAPE CAPACITY (Related to turbine size)			WIND TURBINE LANDSCAPE TYPES		GUIDANCE: Turbine Sizes Max. Numbers in Group Min Group Separation Distances	GUIDANCE: Landscape Analysis and Comment on Currently Consented and Proposed Turbines
					M	L	VL	Consented	Proposed Limits to Development		
Key: <div><div></div> No Capacity</div> <div><div></div> Low Capacity</div> <div><div></div> Medium Capacity</div> <div><div></div> High Capacity</div> Turbine Sizes: M = Medium (25- <50m); L = Large (50- <100m); VL = Very Large (100m+)											
<h3>Summary of Capacity and Cumulative Development in the Midland Valley Lowland Landscapes</h3> <p>The Midland Valley Lowlands comprise 6 landscape types: <i>The Lowland Hills and Valleys</i>; <i>Lowland Sloping Farmland</i>; <i>Lowland Dens</i>, <i>Lowland Glacial Meltwater Valleys</i>, <i>Lowland River Basin</i> and <i>Lowland Loch Basin</i>.</p> <p>The lowland landscape types in Fife have the highest capacity for wind turbine development, although this varies across character types. There are no areas with high capacity (as can be found in some areas of Scotland). However the extensive farmland areas of the <i>Lowland Hills and Valleys</i>, <i>Lowland Sloping Farmland</i> and <i>Lowland River Basins</i> have a medium or medium/high capacity due to their larger scale, simple landform and landscape patterns and in some cases strong influence of existing development. In contrast, the smaller scale valley landscapes of the <i>Lowland Dens</i> and parts of <i>Lowland Glacial Meltwater Valleys</i> have little or no capacity due to their smaller scale landscapes, enclosure and more complex landform and pattern. <i>Lowland Loch Basins</i> have low capacity due to their limited extent and scenic qualities.</p> <p>Current consented or built developments are concentrated in or adjacent to the <i>Lowland Hills and Valleys</i> and <i>Lowland River Basins</i> between Cowdenbeath, Glenrothes, Kirkcaldy and Leven. There are 33 very large turbines and three large turbines, in groupings of: four windfarms (Little Raith, Earlseat, Westfield and Clentrie Farm); two other clusters (to the south of Mossmorran and between Glenrothes and Thornton); one single turbine south of Cardenden, and five medium turbines. This has created an extensive <i>Wind Turbine Landscape</i> around Mossmorran and between Kirkcaldy and Glenrothes to Earlseat. Elsewhere in these landscape types there are scatterings of predominantly small and medium size turbines creating areas of <i>Landscape with Wind Turbines</i> and some areas of <i>Landscape with Occasional Wind Turbines</i>.</p> <p>The current distribution of operational very large turbines is in one of the most developed areas of Fife, with numerous settlements and industry as well as intensive agriculture and mineral extraction past and present. There is a logic to this distribution in that it relates to the location of energy consumers and productive land. However it also brings larger turbines close to settlements and there is potential for cumulative effects with other tall objects in the landscape including electricity pylons and industrial complexes such as Mossmorran. Accepting larger wind energy developments in the lowland areas requires determining an acceptable limit to cumulative development, based on inherent landscape capacity and taking into account existing consented development. The areas with greatest inherent capacity lie between the main towns where the landscape character is less sensitive to development and in the wide, flat <i>Lowland River Basins</i>. These areas can accept a <i>Landscape with Wind Turbines</i> which would include small groupings of large or very large turbines. However, there are potential limits to further development as some capacity is already taken up by consented developments and areas are adjacent to more sensitive landscapes. The localised pockets of cumulative development around Mossmorran and between Glenrothes and Kirkcaldy to Earlseat have created a <i>Wind Turbine Landscapes</i> which are in excess of the local capacity. These landscapes are considered to have now exceeded their capacity for wind turbines.</p> <p>The remaining <i>Lowland Hills and Valleys</i> and <i>Lowland River Basins</i> surrounding Dunfermline, Kincardine, Auchtermuchty, Cupar and St Andrews, whilst similar in scale, landform and pattern to their southern counterparts, are more sensitive due to varying factors relating to location. This includes a more rural character, greater visual sensitivity, proximity to sensitive upland and dens landscapes and in the case of St Andrews and Dunfermline, green belts protecting the setting of historic towns. It is recommended that most of these areas are not developed beyond a <i>Landscape with Occasional Wind Turbines</i> and do not take very large turbines over 100m. There should be no further development in green belts.</p> <p><i>Lowland Open Sloping Farmland</i> in the East Neuk has similar inherent capacity due to its simple landform and landscape pattern. It could accommodate a <i>Landscape with Wind Turbines</i>. However it is more open and exposed than most of the <i>Lowland Hills and Valleys</i> and <i>Lowland River Basins</i> and is a hinterland to more sensitive coastal landscapes of the East Neuk and <i>Lowland Dens</i>. It is recommended turbine heights are kept below 100m. There are now six operational large turbines at Bonerbo and Lochton in the centre of the LCU, 6 very large turbines approved on appeal at Kenly wind farm close to a <i>Lowland Dens</i> LCU along with several medium and low turbines which are operational and have been granted consent within this LCU. This means that part of this LCU has become a <i>Landscape with Wind Turbines</i>. Whilst there is still some capacity for low and medium wind turbines within this area this will depend on the proximity of other wind turbine proposals and local circumstance.</p> <p>The smaller scale lowland landscapes of limited area should be restricted in further development to a <i>Landscape with Occasional Wind Turbines</i> or not developed at all. Due to their smaller scales this would mean no turbines larger than medium. In the case of most of the <i>Lowland Dens</i>, which are small scale, sheltered and restricted in area, it is recommended that there is no turbine development of turbines above 25m; although the area to the north of Largo is a wider area of more mixed landscape in which farmland areas between dens are capable of accommodating turbines of medium size.</p>											

LANDSCAPE TYPE / UNIT	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	LANDSCAPE CAPACITY (Related to turbine size)			WIND TURBINE LANDSCAPE TYPES		GUIDANCE: Turbine Sizes Max. Numbers in Group Min Group Separation Distances	GUIDANCE: Landscape Analysis and Comment on Currently Consented and Proposed Turbines
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Key: <div><div></div> No Capacity</div> <div><div></div> Low Capacity</div> <div><div></div> Medium Capacity</div> <div><div></div> High Capacity</div> Turbine Sizes: M = Medium (25- <50m); L = Large (50- <100m); VL = Very Large (100m+)											
Midland Valley Coastal Landscapes											
11. Coastal Hills (FFE11)	Medium	Medium/ High	Medium/ High	Medium/ High	<div></div>	<div></div>	<div></div>	Coastal Hills with no wind turbines Coastal Hills with Wind Turbines (part of East Wemyss)	Coastal Hills with Occasional Wind Turbines Coastal Hills with Wind Turbines (part of East Wemyss)	Turbine Sizes: 25-50m Group Sizes: 1. Separation Distances: 4-6km	Landscape Analysis: LCUs are subject to a number of designations and form backdrop to a number of coastal settlements. Further development should be limited to well-separated single medium turbines. Associated with buildings or in areas backclothed by higher ground and/or trees. No capacity in green belt area overlooking St Andrews. Existing, Consented and Proposed Turbines: Two small turbines operational in this LCU in south west Fife and one medium turbine operational at Fliskmillan along the north Fife coast. There are 8 very large operational turbines at Earlseat Farm in adjacent Vale of Leven <i>Lowland River Basin</i> LCU which dominate most of East Wemyss LCU. No current proposals.
12. Coastal Terraces (FFE12)	Medium	Medium/ High	Medium/ High	Medium/ High	<div></div>	<div></div>	<div></div>	Coastal Terraces with no wind turbines	Coastal Terraces with no wind turbines	No Turbines	Landscape Analysis: In the East Neuk and near St Andrews this type is not suitable for wind turbine development due to its open character and location as a backdrop to coast and towns. Existing, Consented and Proposed Turbines: No wind turbines or current proposals located in Coastal Terraces. Three medium turbines operational in nearby <i>Lowland Open Sloping Farmland</i> within Crail-St Monance LCU. There is a consented proposal for two small turbines at Easter Grangemuir north of Pittenweem.
Northeastern LCUs	Medium/ Low	Medium/ High	Medium	Medium	<div></div>	<div></div>	<div></div>	Coastal Terraces with no Wind Turbines	Coastal Terraces with Occasional Wind Turbines	Turbine Sizes: 25-50m; 50-100m Group Sizes: 1-5 (medium); 1 (large). Separation Distances: 4-6km (medium); 6-12km (large)	Landscape Analysis: In the northeast of Fife this type is less exposed to expansive coastal views and does not have the same importance as a backdrop to key conservation areas. Existing, Consented and Proposed Turbines: No wind turbines or current proposals above 25m height
13. Coastal Cliffs (FFE13)	High	Medium/ High	High	Medium/ High	<div></div>	<div></div>	<div></div>	Coastal Cliffs with no wind turbines	Coastal Cliffs with no Wind Turbines	No turbines	Landscape Analysis: The Coastal Cliffs are unsuitable for wind turbines. Existing, Consented and Proposed Turbines: No wind turbines or current proposals located in or near Coastal Cliffs.
14. Coastal Braes (FFE14)	High	Medium/ High	Medium/ High	Medium/ High	<div></div>	<div></div>	<div></div>	Coastal Braes with no wind turbines	Coastal Braes with Occasional Wind Turbines	No turbines	Landscape Analysis: This type is not suitable for wind turbine development due to its small scale and location as a backdrop to the coast. Existing, Consented and Proposed Turbines: No wind turbines or current proposals above 25m height located in or near coastal braes. One small turbine operational at Blair Castle in the South West.
15. Coastal Flats (FFE15)	Medium	Medium/ High	Medium/ High	High	<div></div>	<div></div>	<div></div>	Coastal Flats with no wind turbines	Coastal Flats with no wind turbines	No turbines	Landscape Analysis: Areas N of St Andrews unsuitable due to higher landscape value based on setting to St Andrews and R&A Golf Courses Existing, Consented and Proposed Turbines: No wind turbines or current proposals above 25m height.

LANDSCAPE TYPE / UNIT	Landscape Character Sensitivity	Visual Sensitivity	Landscape Sensitivity	Landscape Value	LANDSCAPE CAPACITY (Related to turbine size)			WIND TURBINE LANDSCAPE TYPES		GUIDANCE: Turbine Sizes Max. Numbers in Group Min Group Separation Distances	GUIDANCE: Landscape Analysis and Comment on Currently Consented and Proposed Turbines
					M	L	VL	Consented	Proposed Limits to Development		
Key: <div><div></div> No Capacity</div> <div><div></div> Low Capacity</div> <div><div></div> Medium Capacity</div> <div><div></div> High Capacity</div> Turbine Sizes: M = Medium (25- <50m); L = Large (50- <100m); VL = Very Large (100m+)											
Northeastern LCUs (Tentsmuir area)	Medium	Medium/ High	Medium/ High	Medium/ High	<div></div>	<div></div>	<div></div>	Coastal Flats with no wind turbines	Coastal Flats with Occasional Wind Turbines	Turbine Sizes: 25-50m; 50-100m Group Sizes: 1-5 (medium); 1 (large). Separation Distances: 4-6km (medium); 6-12km (large)	Landscape Analysis: Areas around Tentsmuir are less important to setting of St Andrews but have value for recreation and are relatively natural landscapes (seashore and estuary). Also very visible from higher ground and across Firth of Tay. Therefore only suitable for occasional wind turbine development in less sensitive locations. Existing, Consented and Proposed Turbines: No wind turbines or current proposals above 25m height
Longannet LCU	Medium/ Low	Medium/ High	Medium	Medium/ Low	<div></div>	<div></div>	<div></div>	Coastal Flats with no wind turbines	Coastal Flats with Wind Turbines	Turbine Sizes: 25-50m; 50-100m; 100m+ Group Sizes: 1-3 (medium, large and very large). Separation Distances: 3-5km (medium); 5-10km (large and very large)	Landscape Analysis: Larger turbines should only be located in areas associated with industry (eg. Longannet Power Station). Existing, Consented and Proposed Turbines: No wind turbines or current proposals above 25m height
<div>Summary of Capacity and Cumulative Development in the Midland Valley Coastal Landscapes</div> <p>The Coastal Landscapes comprise 5 main landscape types: <i>Coastal Hills</i>; <i>Coastal Terraces</i>; <i>Coastal Cliffs</i>, <i>Coastal Braes</i> and <i>Coastal Flats</i>.</p> <p>The Coastal landscape types in Fife have a varied capacity for wind turbine development, sometimes within the same landscape character type. Types such as <i>Coastal Cliffs</i> and <i>Coastal Braes</i> are very limited in extent and scale, have steep landforms and sometimes form the setting to historic settlements and therefore have no capacity. Other more extensive types such as <i>Coastal Terraces</i> and <i>Coastal Flats</i> have a suitable simple landform and pattern, and cover extensive areas. However, some units form the setting to historic and picturesque coastal settlements, particularly the East Neuk and St Andrews. Furthermore the coastal location renders them visually sensitive, as tall objects are seen starkly contrasted against the sea. This greatly limits the extent and scale of potential development without leading to very significant effects. Nevertheless some units in the northeast are more remote from sensitive settlements and can accommodate a limited number of medium and large turbines. One area of <i>Coastal Flats</i> between Kincardine and Longannet power station does however have medium to high capacity due to its much more developed setting. <i>Coastal Hills</i> as a type also has some limited capacity for medium size turbines.</p> <p>Currently there are only four small or medium size turbines within the coastal landscape types and two small turbines proposed. These are <i>Landscapes with No Turbines</i>. However the consented eight turbine windfarm at Earlseat Farm has created a <i>Landscape with Wind Turbines</i> which extends into the East Wemyss <i>Coastal Hills</i>.</p> <p>It is recommended that the coastal landscape types with some capacity for development can accommodate wind energy development to the extent of becoming a <i>Landscape with Occasional Wind Turbines</i>. However the <i>Coastal Flats</i> area adjacent to Longannet would be capable of accommodating a number of large or very large turbines. Smaller scale types and areas forming the setting to East Neuk and St Andrews should not be developed for wind energy.</p>											

Appendix B. Demonstrating compliance with Policy 11: Low Carbon Fife (sustainable buildings and district heating requirements)

Requirements under Policy 11: Sustainable Buildings	
1. Demonstrate that the application meets the CO ₂ emissions reduction targets currently in place and that the required proportion of that reduction is met by low and zero carbon generation technologies	
Does an exemption apply? The exemptions listed in building Standard 6.1 apply including: <ul style="list-style-type: none"> • Conversions of buildings; • Small extensions; • Development proposals which are not heated or cooled (other than heating for frost protection); • Temporary buildings with an intended life of less than 2 years. 	Yes/No If no has an energy statement of intention been submitted? - Yes/No
2. Demonstrate that construction materials come from local or sustainable sources	
A statement should be included setting out that the development will endeavour to provide the materials from local or sustainable sources. Additional detail should be included if available.	
3. Demonstrate that water conservation measures are in place	
A statement should be included setting out that the development will include water conservation measures. Detail of the measures to be taken should be included if available.	
4. Demonstrate that sustainable urban drainage measures will ensure that there will be no increase in the rate of surface water run-off in peak conditions or detrimental impact on the ecological quality of the water environment	
We require Compliance and Independent Check Certificate's to be submitted as per Fife Council's Sustainable Drainage Systems (SuDS) - Design Criteria Guidance Note (see the Appendices to the note).	
5. Demonstrate that facilities are provided for the separate collection of dry recyclable waste and food waste.	
PPP applications: We require a statement setting out that measures for the storage of dry recyclable waste and food waste will be provided as part of the development.	
Full/detailed applications: We require full details on how dry recyclable waste and food waste will be stored.	
All development should encourage and facilitate the use of sustainable transport appropriate to the development, promoting in the following order of priority: walking, cycling, public transport, cars.	
PPP applications: A statement should be included setting out the intended measures to encourage and facilitate the use of sustainable transport focusing on the order of priority set out in policy 11.	
Full/detailed applications: We require full details on how the development encourages and facilitates the use of sustainable transport focusing on the order of priority set out in policy 11.	
Requirements under Policy 11: District Heating	

All applications which create a heat demand or waste heat will be assessed against the Fife Heat Map.

All applications for proposals which fit this description need to be tested against the district heating process map set out in section 3.2.2 of the Low Carbon Fife Supplementary Guidance - to establish if a further investigation into heat networks is required.

Is the proposal within 1km of an existing or proposed heat network? Yes/No

(See Appendix F: Heat Network Buffer zone Maps).

If yes – has an indicative heat demand been provided for the development - Yes/No?

The following table should be used to determine if further investigation is required into heat networks.

Buffer distance (m) to an existing or proposed heat network (see appendix F)	When further investigation into connecting to an existing or proposed heat network would be required – based on the indicative heat demand of the development Indicative heat demand (MWh) of the development* (see sources of information below)	Benchmark information* – this gives an indication on the scale of development which is estimated to have an indicative heat demand equal to or in excess of that shown in the previous column – note information on other types of development is available in the DECC: Assessing the cost effectiveness of individual metering: Energy Demand Benchmarks document				
		flats	detached houses	small food or general retail m ²	large food retail m ²	office development m2
20	80+	12	5	421		615
50	200+	29	12	1052	1710	1538
100	400+	58	24	2106	3418	3077
200	800+	116	46	4211	6837	6154
500	2000+	288	116	10527		15385
1000	4000+		231	21053		30769

Is further investigation into heat networks required – Yes/No?

If yes - has a further investigation into heat networks been provided? Yes/No?

Is the proposal for one of the following types of development? Yes/No

- A public sector development;
- A further education campus;
- A proposal for over 10,000m² non-domestic development with an anchor customer (anchor customers include swimming pools, hospitals, aqua-culture and industrial units or indeed any other building with a significant and stable heat demand)
- A mixed use development – with at least 50 residential units and at least 10,000m² of buildings with the following uses, education, community and leisure, retail, healthcare, manufacturing/industrial

If yes – has information on the linear heat density of the development been provided – Yes/No?

(see Low Carbon Fife SG section 3.2.2 for more information)

Is the linear heat density 4 or over – Yes/No?

(see Low Carbon Fife SG section 3.2.3 for more information)

If yes – has further investigation into heat networks been provided – Yes/No?

Appendix C extract from *Visual Representation of Wind Farms: Scottish Natural Heritage (Dec 2014)*

Annex B Standard requirements which all visualisations should comply with

Checklist

Photography	Camera	Full Frame Sensor Size	
	Lens	50mm fixed focal length	
	Camera height	1.5m (unless alternative height can be justified, in agreement with planning authority)	
	Location	Grid reference, relevant location map, and photograph of tripod location provided	
Photomontage	Image	Clear of foreground objects	
	Conditions	Visibility sufficiently good	
	Baseline panorama and wireline	Cylindrical projection 90, 180, 270 or 360 degrees printed on A1 length sheet(s). Image size for both the baseline panorama and wireline should be 820mm by 130mm	
	Wireline	Planar projection, image size 260 by 820mm on A1 sheet. HFOV 53.5° and VFOV 18.2°	
	Panorama	Planar projection, image size 260 by 820mm on A1 sheet. HFOV 53.5° and VFOV 18.2°	
	Viewpoint pack	A3 single frames from viewpoints agreed with determining authority, image size 260 by 390mm. HFOV 27° and VFOV 18.2°	
	JPEG	Cylindrical projection jpeg for uploading to digital viewer. VFOV 18.2° and HFOV as required	
	Principal Distance	Printed on visualisations	
Maps	Viewpoint map	To include overall viewpoint location map (combined with ZTV). Thumbnail location map provided on each panorama	
Methodology		Statement of methodologies used to produce visualisations including ZTVs and software used	

HFOV = Horizontal field of view

VFOV = Vertical field of view

Appendix D: Air Quality Impact Assessments

Establishing the need for an Air Quality Impact Assessment

The impact of a development on the air quality of the local area around it is assessed using a two stage process to determine if a more detailed Air Quality Impact Assessment will be required.

The **first stage** will screen out the smaller developments and / or the development whose impacts can be considered to have an insignificant affect.

The **second stage** provides more specific guidance as to when an air quality assessment is likely to be required.

NOTE:

For applications subject to an Environmental Impact Assessment (listed in Environmental Impact Assessment (Scotland) Regulations 2017), air quality impacts need to be addressed in ALL CASES.

Some industrial and commercial activities will also need a permit to operate – you should apply to the Scottish Environment Protection Agency (SEPA) for these permits.

Stage 1:

The proposal is judged against the criteria set out in table 1. If a development proposal meets both criteria (A) and (B) in table 1 it is appropriate to move on to Stage 2.

If none of the criteria in table 1 are met there should be no need to proceed to Stage 2.

Table 1. Stage 1 Criteria

Criteria to Proceed to Stage 2	
A.	If any of the following apply: <ul style="list-style-type: none">• 10 or more residential units or a site area of more than 0.5ha• More than 1,000m² of floor space for all other uses or a site area greater than 1ha
B.	Coupled with any of the following: <ul style="list-style-type: none">• The development has more than 10 parking spaces• The development will have a centralised energy facility or other centralised combustion process
Note: Consideration should be given to the potential impacts of neighbouring sources on the site, even if an assessment of impacts of the development on the surrounding area is screened out.	

Source: Table 6.1: Stage 1 Criteria, Delivering Cleaner Air for Scotland, Development Planning & Development Management. EPS and RTPI Scotland, January 2017.

Stage 2:

The proposal is judged against the more specific criteria set out in Table 2 to identify if an Air Quality Assessment is required.

Table 2. Indicative criteria for requiring an air quality assessment

The development will:	Indicative Criteria to Proceed to an Air Quality Impact Assessment*
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans >3.5t gross vehicle weight)	A change of LDV flows of: <ul style="list-style-type: none"> - More than 100 AADT within or adjacent to an AQMA/LEZ - More than 500 AADT elsewhere
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors (HDV = goods vehicles + buses >3.5t gross vehicle weight)	A change of HDV flows of: <ul style="list-style-type: none"> - More than 25 AADT within or adjacent to an AQMA/LEZ - More than 100 AADT elsewhere
3. Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA/LEZ
4. Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle acceleration/deceleration, e.g. traffic lights, or roundabouts.
5. Introduce or change a bus station.	Where bus flows will change by : <ul style="list-style-type: none"> - More than 25 AADT within or adjacent to an AQMA/LEZ - More than 100 AADT elsewhere
6. Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20m of a relevant receptor, coupled with the car park having more than 100 movements per day (total in and out)
7. Have one or more substantial combustion processes	Where the combustion unit is: <ul style="list-style-type: none"> - Any centralised plant using bio fuel - Any combustion plant with single or combined thermal input >300kW - A standby emergency generator associated with a centralised energy centre (if likely to be tested/used >18 hours a year)

Source: Table 6.2: Indicative criteria for requiring an air quality assessment, Delivering Cleaner Air for Scotland, Development Planning & Development Management. EPS and RTPi Scotland, January 2017.

* The criteria are more stringent where the traffic impacts may arise on roads where concentrations are close to the air quality objective. The presence of an AQMA is taken to indicate the possibility of being close to the objective, but where whole authority AQMAs are present and it is known that the affected roads have concentrations below 90% of the objective the less stringent criteria are likely to be more appropriate.

If table 2 identifies that an air quality impact assessment is likely to be required, it may take the form of either a Simple Assessment or a Detailed Assessment.

Note: meeting a criterion in Table 2 does not automatically lead to the requirement for a Detailed Assessment.

If none of the criteria in table 2 are met, there should be no requirement to carry out an air quality impact assessment.

If the assessment identifies that an air quality impact assessment is likely to be required you are advised to **contact Fife Council as soon as possible**. We can help you to identify and mitigate or compensate for any impacts your proposal may have on air quality.

Air Quality Impact Assessments

Proposals which are considered to impact on or be affected by air quality issues need to be supported by an air quality impact assessment which includes:

- (1) *Relevant details of the proposed development* - a description containing information relevant to the air quality assessment should be provided.
- (2) *The policy context for the assessment* - this should summarise the national and local policies that should be taken into account in the assessment.
- (3) *Description of the relevant air quality standards and objectives* – to assess compliance with UK air quality objectives.
- (4) *The basis for determining significance of effects arising from the impacts* - the descriptors used for describing the severity of impacts should be set out, together with the basis for determining the significance of the effects arising from air quality impacts.
- (5) *Details of the assessment methods* - this section should provide details of the methods, including the input data used for the assessment and any assumptions that have been made.
- (6) *Model Verification* – if modelling is undertaken then this should include a comparison of the predicted versus measured concentrations.
- (7) *Identification of sensitive locations* - local receptors should be identified, including residential and other properties close to and within the proposed development.
- (8) *Description of baseline conditions* – the findings of any site visits and/or desktop investigations will be set out, noting sources that may affect local air quality. A description of available monitoring data will be important to help define baseline conditions and put the model results into context. Reference should be made to the background maps produced by the Scottish Government, together with any adjustment of these mapped values to take account of local monitoring.
- (9) *Assessment of impacts* - differences in concentrations between ‘with development’ and ‘no development’ conditions should be provided.
- (10) *Description of construction phase impacts* - the assessment should take into consideration the likely activities, duration and mitigation measures to be implemented.

(11) *Cumulative impacts and effects* - in many cases, the impact of the development being assessed will have a cumulative effect with other planned developments, which may or may not have planning permission. Where these developments have been granted planning consent and are therefore 'committed' developments, their impacts should be assessed cumulatively with those of the application site.

(12) *Mitigation measures* - in those cases where a significant effect is identified then the measures to be employed to avoid, reduce and, where appropriate, offset this effect should be set out. Mitigation measures could include:

- the design and layout of development to increase separation distances from sources of air pollution;
- using green infrastructure, in particular trees, to absorb dust and other pollutants;
- means of ventilation;
- promoting infrastructure to promote modes of transport with low impact on air quality;
- controlling dust and emissions from construction, operation and demolition;
- contributing funding to measures, including those identified in air quality action plans and low emission strategies, designed to offset the impact on air quality arising from new development; and
- provision of chargepoints for electric vehicles.

(13) *Summary of the assessment results* - this should include:

- Impacts during the construction phase of the development (usually on dust soiling and PM₁₀ concentrations);
- Impacts on existing receptors during operation;
- Impacts of existing sources on new receptors, particularly where new receptors are being introduced into an area of high pollution;
- Any exceedances of the air quality objectives arising as a result of the development, or any worsening of a current breach (including the geographical extent);
- Whether the development will compromise or render inoperative the measures within an Air Quality Action Plan, where the development affects an AQMA;
- The significance of the effect of any impacts identified; and
- Any apparent conflicts with planning policy.

It may be necessary for you to arrange for an Air Quality Impact Assessment to be undertaken to support your application. This part of the process normally only applies to applications for major developments.

The application will be assessed taking into account the above statement and all other relevant information.

Reports which fail to include the above information will be returned. This may result in a delay to your application being processed.

Please note: Professional judgement is needed when deciding if an air quality assessment is necessary – it is not possible to apply an exact and precise set of standard criteria to all

development control situations. For this reason, you should contact the Council before commissioning an Air Quality Impact Assessment.

When considering air quality issues associated with your proposals, you may wish to employ a specialist Air Quality Consultancy service. Care should be taken when appointing a consultant – you should be satisfied that your consultant fully understands and can meet the requirements of an appropriate air quality assessment. While Fife Council cannot recommend consultants, reference can be made to the relevant trade directories of the Ends Directory www.endsdirectory.com

Further information about air quality impact assessments and planning issues can be found in DEFRA's Local Air Quality Management Technical Guidance LAQM.TG (16) and EPS and RTPI Scotland's Delivering Cleaner Air For Scotland, Development Planning & Development Management, January 2017.

Information relating to local air quality management matters can also be found on our website www.fifedirect.org.uk/airquality

Useful contacts

Development Management
Kingdom House
Kingdom Avenue
Glenrothes
Fife
KY7 5LY
Development.Central@fife.gov.uk

Environmental Health (Land & Air Quality)
Kingdom House
Kingdom Avenue
Glenrothes
Fife
KY7 5LY
Air.Quality@fife.ov.uk

SEPA (Glenrothes Office)
Pentland Court
The Saltire Centre
Glenrothes
KY6 2DA
01592 776910

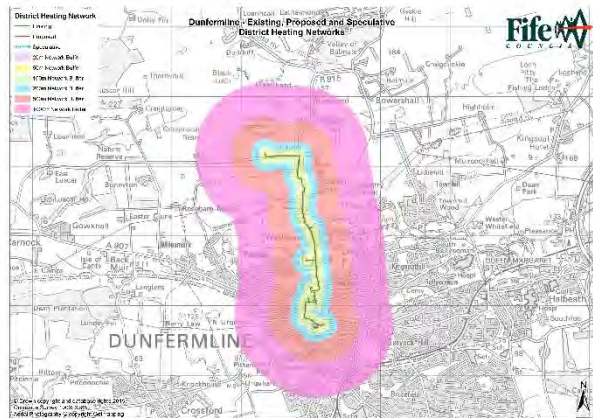
SEPA (Stirling Office)
Bremner House
The Castle Business Park
Stirling
FK9 4TF
01786 452595

Appendix E: Buffer zone maps around existing and proposed heat networks in Fife

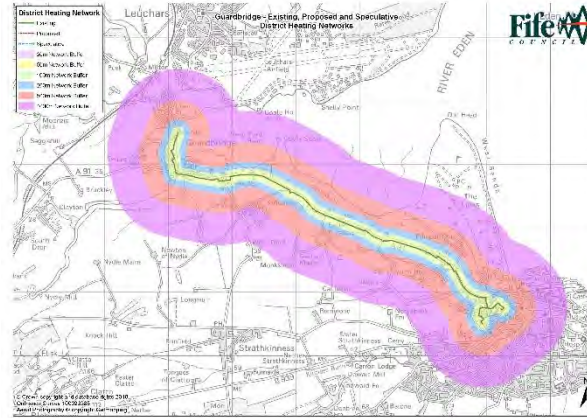
Currently there are three existing and proposed heat networks in Fife which have heat network buffer zones identified around them. If other heat networks are developed in Fife or there are proposals which move beyond early development stages these will need to be taken into account and will be added to future versions of the supplementary guidance.

The three heat networks which currently have buffer zones identified are:

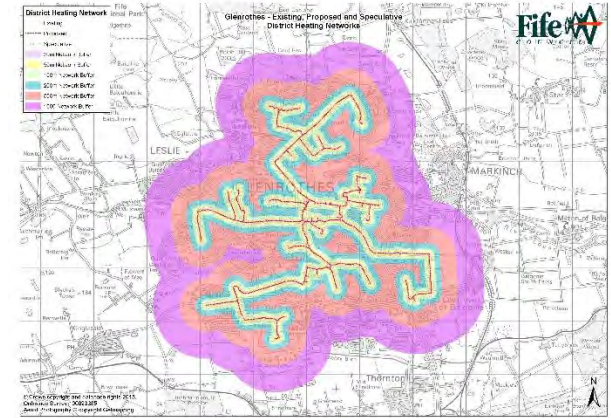
Dunfermline:



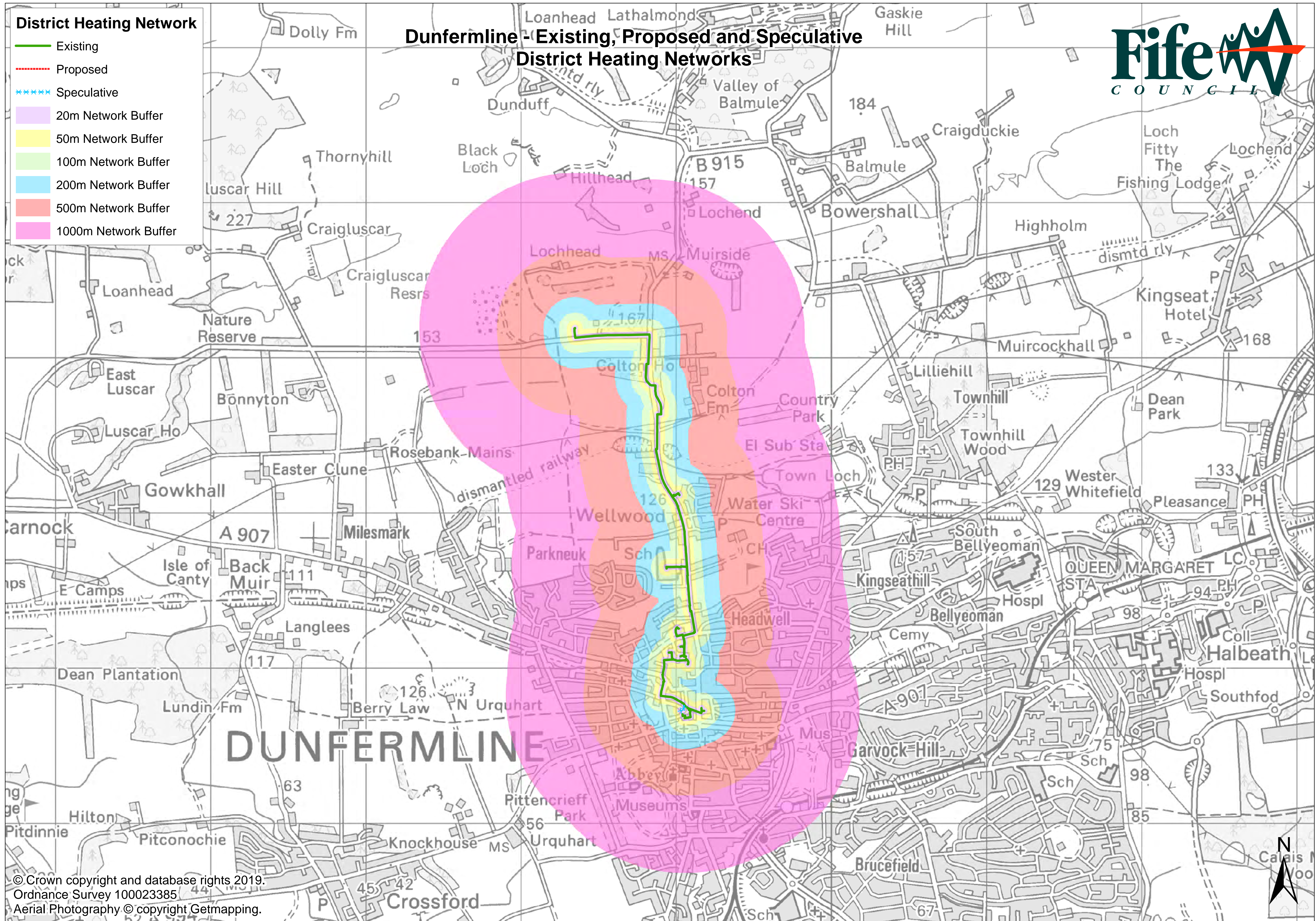
Guardbridge:



Glenrothes:



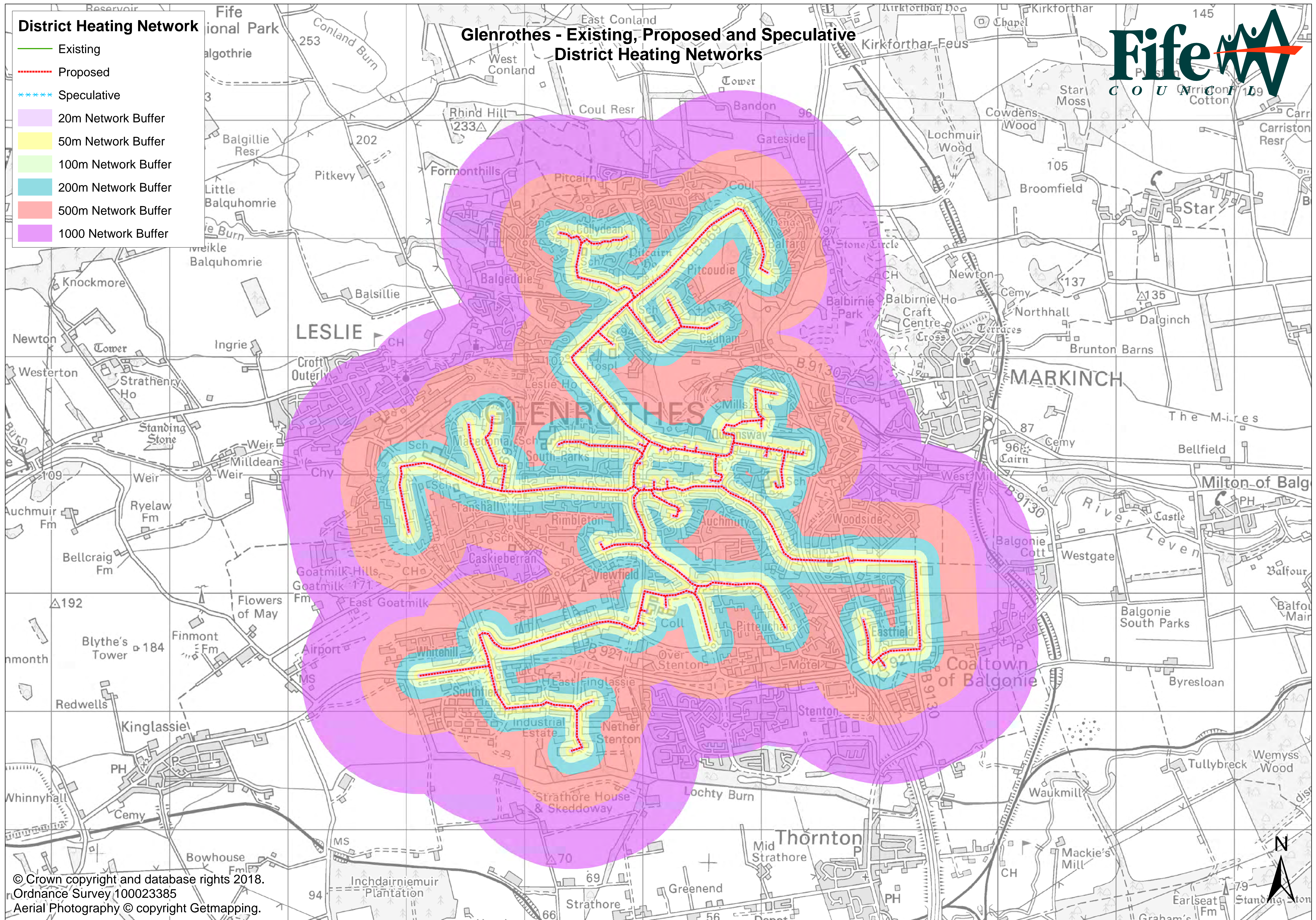
- Existing
- Proposed
- Speculative
- 20m Network Buffer
- 50m Network Buffer
- 100m Network Buffer
- 200m Network Buffer
- 500m Network Buffer
- 1000m Network Buffer



District Heating Network

- Existing
- Proposed
- Speculative
- 20m Network Buffer
- 50m Network Buffer
- 100m Network Buffer
- 200m Network Buffer
- 500m Network Buffer
- 1000 Network Buffer

Glenrothes - Existing, Proposed and Speculative District Heating Networks



District Heating Network

- Existing
- Proposed
- Speculative
- 20m Network Buffer
- 50m Network Buffer
- 100m Network Buffer
- 200m Network Buffer
- 500m Network Buffer
- 1000m Network Buffer

Guardbridge - Existing, Proposed and Speculative District Heating Networks

