**LIGHT CHAPTER - PROPOSED DISTRICT PLAN**
**FNDC Proposed District Plan Hearing 6 - October 2024**
**Statement by Vision Kerikeri, Carbon Neutral Trust and Kapiro Conservation Trust**

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Our comments address provisions relating to:
Indigenous wildlife; light pollution affecting night skies; energy efficiency.

**Comments on s42 officers' amendments in PDP Light chapter**

- ***Overview:*** We support s42 report's new text about night sky values:

> nocturnal species including insects. In addition, the night sky has important cultural and natural values associated with it that may be sensitive to light in parts of the Far North District.[1]

- ***Notes:*** We support s42 report's new *Note* on CMS Light Pollution Guidelines for Wildlife:[1]

> Note: Guidance on best practice for installing and assessing lights in areas where it could affect the natural behaviour of indigenous fauna, is available in the Convention on Migratory Species – Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds, and Migratory Shorebirds.[2]

However –

  - we propose using this updated weblink for the CMS Guidelines: https://www.cms.int/en/document/light-pollution-guidelines-wildlife-4

  - We propose adding a guideline about dark skies lighting: *International Dark Sky Association principles for responsible outdoor lighting* https://darksky.org/resources/guides-and-how-tos/lighting-principles/

- **LIGHT-P2**: We support s42 report's new clause about indigenous fauna:

> e. manage adverse effects on indigenous fauna where appropriate.[5]

- **LIGHT-S1**: We support s42 report's new clauses about indigenous fauna:

> f. The extent to which artificial lighting affects the natural behaviour of indigenous fauna, including reference to best practice guidance where relevant.[6]

[1] DOC's submission (S364) pointed out that NZ is a signatory party to the United Nations Convention on Migratory species and related Light pollution guidelines.

- ❖ We support the retention of notified PDP text referring to: wildlife (Overview section); enjoyment/views of the night sky and intrinsically dark landscapes (Overview & LIGHT-P2(c)); protecting amenity values (LIGHT-O1); and the environment (LIGHT-O1, LIGHT-P1).

However, we are concerned that the clauses above do **not** need to be considered when activities meet the *Permitted* activity Rule & Standard (LIGHT-R1 and LIGHT S1). This suggests many developments would **not** need to consider impacts on indigenous fauna or general light pollution / dark skies.
We also remain concerned that the Lighting chapter has not referred to energy efficiency.

- ❖ We therefore seek to add another clause in LIGHT-R1:
  'PER-3: The lighting design has considered the following matters:
  - Energy efficient design;
  - Guidelines on wildlife specified in the Overview Note;
  - Guidelines on night skies specified in the Overview Note.'

**Justifications and further explanation**

**Effects of outdoor lighting on native wildlife**
Nocturnal species such as kiwi, some migratory birds, bats and a number of *at risk* or *threatened* species are sensitive to artificial light. Adverse effects of light can include disorientation, changes in feeding behaviour, reproductive changes and growth changes.[2] Therefore, in high density kiwi areas for example, groups such as Kiwi Coast recommend avoiding bright lighting, and using a warm light colour (towards amber/red wavelengths, avoiding white and blue).

**Colour temperature of lighting varies from warm to cool**[3] (measured in Kelvin, K)
warm light: amber/yellow 1000 - 2000 Kelvin …… cold light: blue 10,000 Kelvin


[2] Hutt City Council (2021) *Effects of Artificial Light on Urban Wildlife*, https://www.huttcity.govt.nz/__data/assets/pdf_file/0028/43687/Cardno-report-NZ0120185-WE-RP01-Hutt-City-Photobiology-effects-on-fauna-and-ecosystems-VLD-approved_r.PDF
[3] https://lightingdesignstudio.co.uk/colour-temperature/

Wildlife-friendly lights generally avoid white or blue light by using a 'warm' colour temperature below 3000 Kelvins (preferably below 2700 K).
'warm' white LEDs, for example, are usually around 2700 K or less.[4]
Newer techniques use light of a specific wavelength which is not visible to animals but provides sufficient light for humans (around 590 nanometres).[5]

**Lighting to support dark skies**

Blue light is responsible for brightening the night sky more than any other colour of light. The International Dark-Sky Association (IDA) recommends that outdoor lighting should have colour temperatures below 3000k; ideally 2700 K or lower. Warm-toned lighting is less disruptive to nocturnal animals and has a reduced scattering effect in the atmosphere, resulting in less sky glow.

**Lighting guidelines are similar for wildlife and dark skies**

We would like to point out that consideration of outdoor lighting guidelines for wildlife and night skies is relatively simple. It is not onerous.
In fact, guidelines are similar for both wildlife and dark skies:

- Shield or direct lights so it falls only in the area that needs light.
- Use lower intensity (less bright) light where possible.
- Generally avoid light with blue wavelengths (aim for warmer wavelengths).

**Example of best practice outdoor lighting guidelines to reduce effects on wildlife**

This example comes from Hutt City Council

**Best Practice lighting guidelines**

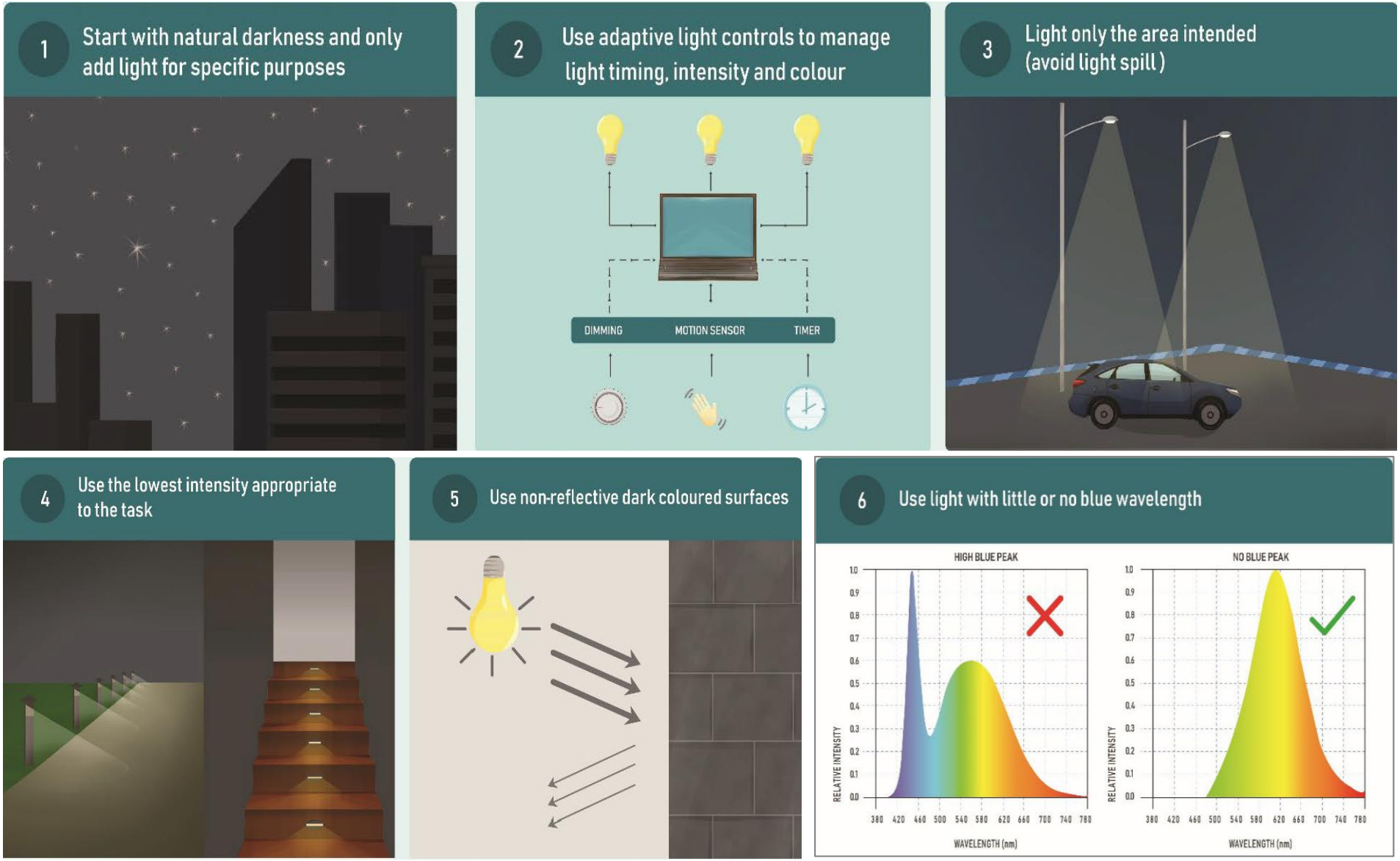
**Natural darkness has conservation value in the same way as clean water, air and soil and should be protected through good quality lighting design.**

**Simple management principles can be used to reduce light pollution, including:**

1. **Start with natural darkness and only add light for specific purposes.**
2. **Use adaptive light controls to manage light timing, intensity and colour.**
3. **Light only the object or area intended – keep lights close to the ground, directed and shielded to avoid light spill.**
4. **Use the lowest intensity lighting appropriate for the task.**
5. **Use non-reflective, dark-coloured surfaces.**
6. **Use lights with reduced or filtered blue, violet and ultra-violet wavelengths.**

[4] Australian National Light Pollution Guidelines for Wildlife (2023), https://www.dcceew.gov.au/environment/biodiversity/publications/national-light-pollution-guidelines-wildlife
[5] Australian National Light Pollution Guidelines for Wildlife.

**Australian National Light Pollution Guidelines for Wildlife**



**International Dark Sky Association principles for responsible outdoor lighting**[6]


## Energy efficiency of outdoor lighting

Statements relating to energy efficiency in relevant lighting design manuals –

**Northland Transportation Alliance** *Design Manual - Street Lighting* (2020) states:

- 'Energy efficiency: The installation **must be** designed for economic use of energy'. (s7.9)
- 'All new or replacement luminaires must be LED.' (s5.2).[7]

**Auckland Transport** *Street Lighting* standards for roads and amenity lighting:

- 'Energy efficiency: The installation must be designed for economic use of energy.'
- 'All new lighting designs or replacement luminaires must be LED.' (s3 & s5.2).[8]

❖ To avoid being inconsistent, the PDP Light chapter should contain similar principles:[9]

- 'Energy efficiency: The installation must be designed for economic use of energy.'

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[6] International Dark Sky Association guidelines, https://darksky.org/resources/guides-and-how-tos/lighting-principles/

[7] Northland Transportation Alliance (2020) *Design Manual - Street Lighting*, s5.2 Luminaires; Appendix C and Appendix D.
https://www.kaipara.govt.nz/uploads/Street%20lighting/NTA%20Street%20Lighting%20Design%20Manual.pdf and https://www.kaipara.govt.nz/street-lighting-design

[8] Auckland Transport *Engineering Design Code - Street Lighting*, p.6, 18, 22, https://at.govt.nz/media/1982229/engineering-design-code-street-lighting.pdf

[9] Disappointingly, FNDC *Engineering Standard* (2023)[9] section on Road Lighting provides insufficient guidelines on lighting design. We will raise this point during the Hearing on Engineering standards.

- 'All new lighting designs or replacement luminaires must be LED.

❖ The PDP should require consideration of energy efficient design.[10]

**RMA requirements on energy efficiency:**

- RMA s7(ba) requires the Council to have *particular regard* to '*the efficiency of the end use of energy'*.
- RMA s74(2): When preparing a plan, Councils are required to have regard to the national *Emissions Reduction Plan*[11] (made under the Climate Change Response Act). The national *Emissions Reduction Plan* specifies a number of actions that are relevant to district plans, such as:

  *Support emissions reductions … via policy, guidelines, direction … on housing and urban development*.' (p.125)

  '*The planning system can … promote low-emissions development – residential, commercial, industrial and infrastructure – that reduce energy demand. When we use less energy, we can delay the need for new electricity infrastructure*.' (p.130)

**RPS *Regional development guidelines***:
District Councils are required to give effect to the RPS (under s75(3) of the RMA). The *Regional development guidelines* (Appendix 2) state that:
'*New subdivision, use and development should: ... Adopt, where appropriate, sustainable design technologies such as the* ***incorporation of energy-efficient (including passive solar) design, low-energy street lighting****...*' [12]

**Energy efficiency provisions in existing ODP:**
The ODP contains a number of provisions requiring consideration and/or promotion of energy efficiency - examples are shown in Box 1 below

**Box 1. Examples of Operative District Plan provisions on energy efficiency**

- 13.1.6: '*The* ***adoption of energy efficiency****… technologies* ***will need to be considered in all new subdivisions and related development***.'
- 13.3.9: '*To ensure, to the greatest extent possible, that all new subdivision supports energy efficient design through appropriate site layout and orientation in order to maximise the ability to provide light, heating, ventilation and cooling through passive design strategies for any buildings developed on the site(s).*'
- 13.4.15 '*That conditions be imposed upon the design of subdivision of land to require that the layout and orientation of all new lots and building platforms created include,*

[10] Disappointingly, FNDC *Engineering Standard* (2023)[10] section on Road Lighting provides insufficient guidelines on lighting design. We will raise this point during the Hearing on Engineering standards.
[11] *First Emissions Reduction Plan* https://environment.govt.nz/what-government-is-doing/areas-of-work/climate-change/emissions-reductions/erp/
[12] NRC*, Regional Policy Statement*, p.163, Appendix 2, Part A, clause (p).

*as appropriate, provisions for achieving the following:…. (a) development of energy efficient buildings and structures;..*'

- Assessment Criteria 13.9.2.3(z) '*the extent to which the application promotes energy efficiency…*'

**PDP generally lacks energy efficiency provisions**

It is extraordinary that the notified PDP barely mentions the need to consider or promote energy efficient design. The PDP contains only these policies:

General Residential Policy GRZ-P7: 'Encourage energy efficient design … in the construction of residential development.'

Mixed Use zone Policy MUX-P6 states: 'Promote energy efficient design … in the construction of mixed use development.'

**Our PDP-wide submissions specifically seek provisions relating to energy efficiency**

Positions stated in our submissions:

> 'The PDP should include objectives, policies and rules/standards that require best practice environmentally sustainable techniques for new developments, including … energy-efficient technologies…'
>
> - submissions by Vision Kerikeri s521.009, s521.015, s521.016, s521.022, s521.023, s521.025; Carbon Neutral Trust s529.055, s529.219, s529.220, s529.227, s529.228; Kapiro Conservation Trust s443.009.[13]
> - Relevant sections of the PDP (as stated in our submissions): all sections of the PDP.

**Our submissions seek** to update PDP provisions and implement RPS guidelines to adopt energy efficient technologies -

> … updating PDP 'rules/standards in the light of climate change and… improved technologies… For example, standards should preferably require, or at minimum actively encourage, the adoption of '*sustainable design technologies such as the incorporation of energy-efficient (including passive solar) design, low-energy street lighting'* as stated in the RPS.'
>
> - submissions by Vision Kerikeri s521; Carbon Neutral Trust s529; Kapiro Conservation Trust s443.
> - Relevant sections of the PDP (as stated in our submissions): all sections of the PDP

Other submitters also seek the PDP improvements to include policies/rules that will reduce climate emissions e.g. s521.002, s521.003, s443.002, s443.003, s529.048, s529.049

[13] FNDC's PDP submission summaries did not note some submission points in relevant PDP sections.

**Annex 1: Mackenzie District Plan Light chapter Standards to protect dark sky**

The District Plan example to protect dark skies, below, shows that the general principles are not very difficult nor onerous.

**Standards**

| | | |
|---|---|---|
| **LIGHT-S1** | **Direction** | **Activity Status where compliance not achieved:** |
| **All Zones** | 1. All fixed exterior lighting shall be directed away from any adjacent roads, residential properties and lakes, with the exception of streetlights which may be directed towards the road that they are intended to illuminate. | **RDIS**<br><br>**Matters of discretion are restricted to:**<br>LIGHT-MD2 |
| **LIGHT-S2** | **Shielding** | **Activity Status where compliance not achieved:** |
| **All Zones** | 1. All outdoor lighting shall be shielded from above in such a manner that all the light shines below the horizontal. | **RDIS**<br><br>**Matters of discretion are restricted to:**<br>LIGHT-MD1 |
| **LIGHT-S3** | **Colour Temperature** | **Activity Status where compliance not achieved:** |
| **All Zones** | 1. The correlated colour temperature of outdoor lighting shall not exceed 3000 K. | **RDIS**<br><br>**Matters of discretion are restricted to:**<br>LIGHT-MD1 |
| **LIGHT-S4** | **Light Source** | **Activity Status where compliance not achieved:** |
| **All Zones** | 1. Only light-emitting diode (LED), low pressure sodium and high pressure sodium light sources shall be used. | **RDIS**<br><br>**Matters of discretion are restricted to:**<br>LIGHT-MD1 |
| **LIGHT-S5** | **Horizontal and Vertical Illuminance** | **Activity Status where compliance not achieved:** |
| **All Zones** | 1. The maximum level of light spill from outdoor lighting shall not exceed the horizontal or vertical illuminance levels on any adjoining site in the receiving zone set out in LIGHT - TABLE 1, excluding roads. | **RDIS**<br><br>**Matters of discretion are restricted to:**<br>LIGHT-MD2 |