# Renewable Energy

## Policy and guidance for the developers and operators of renewable energy installations in the Isle of Man and its territorial airspace

**CP1**

**10 November 2023**

Isle of Man
CIVIL AVIATION ADMINISTRATION

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# Revision history

| Version | Date | Details |
|---|---|---|
| 1 | April 2016 | Initial issue |
| 2 | 10 November 2023 | Full re-write of document, sections added:<br>Safeguarding of aerodromes<br>Solar photovoltaic energy<br>Biogas energy |



Copies of this document are available in large print upon request.

## 1. Overview

1.1 This document provides Isle of Man Civil Aviation Administration (IOMCAA) policy and guidance on a range of issues associated with renewable energy installations and their effects on aviation. These issues will need to be considered by aviation stakeholders, wind energy developers and decision makers in respect of planning applications or applications for marine infrastructure consents when assessing the viability of renewable energy developments on the Isle of Man or within Isle of Man territorial waters/airspace.

1.2 As a Crown Dependency of the UK, the Isle of Man has its own regulatory system and its own legislation. This normally mirrors UK legislation to a large degree, but may contain some differences.

1.3 Section 11B of the Airports and Civil Aviation Act 1987[1] (of Tynwald), gives power to IOMCAA to make orders for the purpose of:

(a) incorporating into the law of the Island any international obligation in respect of civil aviation that has been or will be extended to the Island by the United Kingdom;

(b) regulating within the Island civil aviation in general, including:

- minimising or preventing interference with the use or effectiveness of apparatus used in connection with air navigation;
- securing the safety, efficiency and regularity of air navigation and the safety of aircraft and persons and property carried therein.

1.4 IOMCAA does not have regulatory powers to approve or refuse planning applications or applications for marine infrastructure consents. However, where such developments have adverse safety effects on air navigation services, IOMCAA has an obligation to ensure the providers of such services appropriately mitigate these effects. Responsibility for the provision of safe aerodrome and air traffic service provision primarily lies with the Aerodrome Operator and the Air Navigation Service Provider (ANSP).

1.5 It is not the intention or purpose of this document to provide instruction on the need or means to object to renewable energy developments; this must remain the decision of individual aerodrome operators, service providers or other organisations. Furthermore, it should also be noted that specific circumstances will have to be addressed on a case-by-case basis, as it is not possible or appropriate to prescribe a standard solution.

1.6 IOMCAA has adopted the content of a number of UK Civil Aviation Publications (CAP) and policy statements, as listed in subject specific IOMCAA Publications (CP) available on our website.

## 2. Policy

### 2.1 Isle of Man CAA policy on renewable energy

2.1.1 Renewable energy developments and aviation need to co-exist in order to support the Island's Climate Change Action Plan, whilst meeting national and international transport policies.

[1] AT 10 of 1987 as amended

2.1.2 However, developers must recognise that safety in the air is paramount and cannot be compromised. As the independent aviation regulator, IOMCAA is well placed to provide clarification to both the aviation industry and the renewable energy industry.

2.1.3 Due to the complex nature of aviation operations, and the impact of local environmental constraints, all instances of potential negative impact of proposed renewable energy developments on aviation operations must be considered on a case-by-case basis.

2.1.4 IOM CAA will provide timely advice to aviation and wider renewable energy development stakeholders, in particular:

- Identification of aviation stakeholders that could potentially be affected;
- Reviewing and commenting on the aviation aspects of the Environmental Statement;
- Consideration of regulatory requirements;
- Consideration of whether all other aviation issues known to the IOMCAA have been taken into account (including other potential developments);
- Facilitating contact and interaction with the UK Civil Aviation Authority (UK CAA) where necessary.

2.1.5 Due to the small geographical size and seamless IOM and UK airspace, close collaboration is required with UK aviation stakeholders and UK CAA.

## 2.1 Guidance

2.1.1 The following UK CAA documents are formally adopted for use by renewable energy stakeholders in the Island:

(a) CAP764 Policy and guidance on wind turbines

(b) CAP1616 Airspace change: guidance on the regulatory process

(c) CAP1618 Airspace design: unusual aerial activities

(d) CAP670 ATS safety requirements

(e) All UK CAA airspace policy statements

2.1.2 When referring to the above documents, stakeholders should also take account of the following Isle of Man specifics:

(a) IOM CAA responsibilities are specified in Section 11 and sections 11A-K of the Airports and Civil Aviation Act 1987;

(b) Isle of Man Airport is certified under the Civil Aviation (Aerodromes) Order 2022;

(c) Isle of Man Airport Air Traffic Control is approved under the Civil Aviation (Air Traffic Services) Order 2020 and holds ATS equipment approvals, also issued under that Order;

(d) Isle of Man Airport has a wide variety of communications, navigation, and surveillance facilities located around the Island;

(e) The INDIA-OSCAR-MIKE VHF Omni-directional Range (VOR), situated close to Port St. Mary, is owned and operated by NATS primarily in support of UK air navigation, as well as providing navigational assistance for Isle of Man Airport operations;

(f) The Island has its own Coastguard but the UK Maritime and Coastguard Agency (MCA) provides search and rescue coordination for all of the waters around the Island, with support and advice from IOM Coastguard as required.

## 3. Safeguarding of aerodromes

3.1 Safeguarding is the process by which the Aerodrome Operator can, in consultation with the Local Planning Authority and within their capability, protect the environment surrounding the Aerodrome from developments and activities that have the potential to impact on the aerodrome's safe operation.

3.2 Aerodrome safeguarding covers several aspects. Its purpose is to protect:

(a) The airspace around an aerodrome to ensure no buildings or structures may cause danger to aircraft either in the air or on the ground. This is achieved through both the 'Obstacle Limitation Surfaces' (OLS) and the 'Instrument Flight Procedure' (IFP).

(b) The integrity of radar and other electronic aids to navigation by preventing reflections and diffractions of the radio signals.

(c) Aeronautical lighting, such as approach and runway lighting, by ensuring that they are not obscured by any proposed development and that any proposed lighting, either temporary or permanent, could not be confused for aeronautical ground lighting.

(d) The aerodrome from any increased wildlife strike risk. In particular bird strikes, which pose a serious threat to flight safety.

(e) Aerodrome operations from interference by any construction processes through the production of dust/smoke, temporary lighting or construction equipment impacting on radar and other navigational aids.

(f) Aircraft from the risk of collision with obstacles through appropriate lighting.

(g) Aircraft from the risk of building induced turbulence.

(h) Aircraft from the risk from glint and glare, e.g. solar panels.

3.3 All the above will be taken into account by the aerodrome operator when assessing development proposals.

## 4. Lighting of obstacles

### 4.1 General requirements

4.1.1 Lighting of en-route obstacles is covered under Article 136 of the Air Navigation (Isle of Man) Order 2015[2] and mirrors that required by Article 219 of the UK's Air Navigation Order 2016[3].

4.1.2 The Air Navigation (Isle of Man) Order 2015 does not contain provisions for offshore obstacle lighting. However, Article 220 of the UK's Air Navigation Order 2016 is considered to be best practice ahead of being potentially adopted into Isle of Man legislation in due course.

[2] SI 2015 No 870 (as amended)
[3] Si 2016 No 765

4.1.3 Specific considerations for onshore wind turbines can be found in section 5.2.1 below.

### 4.2 Aircraft detection lighting systems

4.2.1 Aircraft detection lighting system (ADLS) technologies are systems which can detect appropriately equipped aircraft and illuminate the obstruction lighting in response to an aircraft's presence, potentially enabling the visual impact of the lighting to be reduced.

4.2.2 ADLS installations come in two main types: those based on non-cooperative ('primary') surveillance radar and those using electronic conspicuity.

4.2.3 The cost/benefit of the use of primary surveillance radar for the active detection of aircraft, spectrum availability and geographical separation required before radar frequencies can be re-used potentially makes this a less than optimal solution. At the same time, the lack of interoperability between the wide variety of electronic conspicuity devices currently available to be installed on aircraft requires careful consideration of the specification of any passive system receivers and how they are deemed compliant to be deployed and operated.

4.2.4 Developers hoping to use ADLS at their installation will be required to articulate to IOMCAA that aviation safety is assured to a level equivalent to that of continuous illumination.

4.2.5 IOMCAA is aware that ADLS trials are taking place in the UK. The outcomes from these trials will inform our future policy development on the use of such systems in the Island.

## 5. Wind energy

### 5.1 Physical impact

#### 5.1.1 Impact on safety clearances or Obstacle Limitation Surfaces (OLS)

Depending on the location of the wind farm, infringements of the safety clearances or the OLS safeguarding surfaces will need to be assessed by the aerodrome operator.

### 5.2 Technical impact

#### 5.2.1 Lighting requirements for onshore wind turbines

The following applies to all Isle of Man land based wind turbine generators which have a maximum blade tip height at or above 150m above ground level:

(a) The person in charge of the wind turbine generator must ensure that it is fitted with a medium intensity (2000 candela) red light positioned as close as practicable to the top of the fixed structure. A second light serving as an alternative should be provided in case of failure of the operating light;

(b) The lights required by paragraph (a) must be so fitted to show when displayed in all directions without interruption;

(c) Additionally, at least three (to provide 360 degree coverage) low-intensity Type B6 lights (32 candela) lights should be provided at an intermediate level of half the nacelle height;

(d) Subject to sub-paragraphs (e) and (f), the person in charge of a wind turbine generator must ensure that any light required to be fitted by this article is displayed;

(e) Lights should be operated by an acceptable control device (e.g., photocell, timer, etc.) adjusted so the lights will be turned on whenever illuminance reaching a vertical surface falls below 500 LUX. The control device should turn the lights off when the illuminance rises to a level of 500 LUX or more;

(f) In the event of the failure of any light which is required by this policy statement to be displayed, the person in charge of a wind turbine generator must repair or replace the light as soon as practicable. For any outage that is expected to be or is greater than 12 hours, the operator shall request a NOTAM to be issued by informing IOMCAA as soon as possible. This NOTAM is to specifically state (with justification) if the repair/replacement of the light will exceed 72 hours;

(g) If the horizontal meteorological visibility in all directions from every wind turbine generator in a group is more than 5 km, the intensity for the light positioned as close as practicable to the top of the fixed structure required to be fitted to any generator in the windfarm and displayed may be reduced to not less than 10% of the minimum peak intensity specified for a light of this type.

#### 5.2.2 Radar clutter

Wind turbines can cause clutter on the radar screen which may affect the accuracy of detection for aircraft. A radar clutter impact assessment should be taken if the location is close to the approach areas for the aerodrome.

## 6. Solar photovoltaic energy

### 6.1 Physical impact

#### 6.1.1 Impact on safety clearances or Obstacle Limitation Surfaces (OLS)

Depending on the location of the solar photovoltaic energy farm, infringements of the safety clearances or the OLS safeguarding surfaces will need to be assessed by the aerodrome operator.

#### 6.1.2 Bird hazard

This type of development has the potential to attract birds, which needs to be considered during construction and on completion. Birds have been found nesting, roosting or loafing on the solar array structures. If a solar farm development is proposed in proximity to an aerodrome they can become a significant hazard for this reason. Therefore it may be necessary for a Bird Hazard Management Plan (BHMP) to be agreed with the aerodrome operator and the LPA, which details how the development will be managed.

### 6.2 Technical impact

#### 6.2.1 Glare and reflection

Solar energy provision has the potential to produce reflectivity (glint and glare). Reflectivity assessments may be needed to measure the potential of glare and/or flash blindness. The IOM CAA endorses the Federal Aviation Authority (FAA) interim policy titled 'FAA for Solar Energy System Projects': https://www.govinfo.gov/content/pkg/FR-2013-10-23/pdf/2013-24729.pdf

For assessment it is recommended to use the 'Sandia Solar Glare Hazard Analysis Tool' or carry out an equivalent assessment. This is available online from Sandia National Laboratories https://www.sandia.gov/glare-tools/. The analysis tool can be used to predict the likelihood of glare for aircraft paths, fixed points (e.g. the Air Traffic Control Tower) and also predicts potential ocular hazards.

#### 6.2.2 Interference with Communication Navigation Systems (CNS) equipment

Interference with aeronautical communication navigations systems (CNS) equipment must be considered. We recommend that contact is made with the aerodrome operator and the Air Navigation Service Provider (ANSP) at the earliest opportunity to ensure that the relevant aeronautical safety issues have been considered prior to any formal planning application.

#### 6.2.3 Other considerations

It is also wise to consider other implications of accepting SPVs within very close proximity to an aerodrome, especially in the (albeit unlikely) event of an aircraft accident at the site of the panels. If an aerodrome operator is proposing to accept a solar panel in close proximity, a risk assessment should be conducted to help understand what actions should be taken given this scenario, and by whom.

## 7. Biogas energy

### 7.1 Physical impact

#### 7.1.1 Obstacle Limitation Surfaces (OLS)

Depending on the location of the Biogas energy development, infringements of the safety clearances or the OLS shall be assessed by the aerodrome operator, especially as developments can include the use of high stacks for the Biogas plant. Power plants can also prevent a physical obstruction to radar and other communication signals.

#### 7.1.2 Bird hazard

The storage of wastes or crops to be digested at such facilities may create an attractant to large or flocking birds which may create a birdstrike hazard in the vicinity of aerodromes. The storage of such materials should be assessed and managed accordingly.

### 7.2 Technical impact

#### 7.2.1 Thermal plume turbulence

Thermal plume turbulence is caused by the release of hot air from a power plant equipped with a dry cooling system under certain conditions. The plumes generated by these facilities can create invisible turbulences which can affect the manoeuvrability of aircraft.

#### 7.2.2 Visual impacts of a vapour plume

Vapour plumes produce a vapour cloud that can result in localised visual impairment. Plumes are produced by large scale emissions of heated water vapour typically from an evaporative wet cooling system associated with a power plant. Wet cooling towers reject heat into the atmosphere by releasing water vapour. The air leaving the tower is saturated with moisture and warmer than ambient air producing a wet exhaust plume. The saturated exhaust plume may or may not be visible.

During cool mornings in the autumn or spring when the ambient air is moist, cooling towers can add more water to the air, thereby saturating the air and adding water droplets resulting in fog.

### 7.2.3 Radar clutter

Thermal plumes can cause clutter on the radar screen which may affect the accuracy of detection for aircraft. A radar clutter impact assessment should be taken if the location is close to the approach areas for the aerodrome.