Title: Insurance for Unmanned Aircraft **IA No:** DfT00445 **RPC Reference No: RPC-DfT-5196(1)** **Lead department or agency:** Department for Transport **Other departments or agencies:**	**Impact Assessment (IA)** **Date: 06/05/2022** **Stage: Final** **Source of intervention:Domestic** **Type of measure: Primary Legislation** **Contact for enquiries:** FutureofFlight@dft.gov.uk

Summary: Intervention and Options

RPC Opinion: RPC Opinion Status

Cost of Preferred (or more likely) Option (in 2019 prices)			
Total Net Present Social Value - NQ	**Business Net Present Value -** NQ	**Net cost to business per year -** NQ	**Business Impact Target Status** Qualifying Provision

What is the problem under consideration? Why is government intervention necessary?

Retained EU Regulation (EC) No. 785/2004 ("Insurance Regulation") requires carriers and operators of certain aircraft to hold adequate levels of insurance in order to meet their liabilities in the event of an accident. The term 'model aircraft' is used but not defined in this Regulation to exclude some aircraft from its requirements. There is no mention of unmanned aircraft ("UA"), which are usually distinguished from model aircraft , so the legal applicability of insurance to the former is unclear. In addition, concerns have been expressed that the minimum level of insurance required by the Insurance Regulation is too low[1], therefore users may be buying inadequate insurance, and that it may be inadequate in other ways.[2] Government intervention provides certainty to achieving the Government's vision for the UK market for unmanned aircraft.

What are the policy objectives and the intended effects?

1) Design and develop insurance requirements that ensure operators of UA are obliged to take out adequate coverage and that those affected by accidents are protected.
2) Ensure insurance requirements for UA are user friendly and coherent.
3) Allow the Government to make adaptations to insurance requirements to reflect and account for the rapidly changing market, whilst ensuring that the UK environment is internationally competitive.

What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base) (Option 0 is do nothing)

1) Create an enabling power in primary legislation for the Secretary of State to create clear requirements relating to insurance for UA. Secondary legislation would define the detail of the specific requirements.
2) Work with industry to encourage best practice standards.
3) CAA providing further guidance or awareness on recommended insurance requirements.

Option 1 is preferred as it offers protection to users of UA and potential victims of accidents more comprehensively than the other options due to the clarity and legal enforceability it provides. Subsequently using secondary legislation to detail the specific requirements provides flexibility to make changes to UA insurance requirements as the use cases of these aircraft expand and the technology develops. Pursuing Option 1 does not preclude Options 2 and 3 being chosen later or undertaken alongside Option 1.

Will the policy be reviewed? It will be reviewed on an ongoing basis to ensure the objectives described above are being achieved. Requirements set out in secondary legislation will be formally reviewed in line with the Magenta Book.

Does implementation go beyond minimum EU requirements?		Yes		
Is this measure likely to impact on international trade and investment?		No		
Are any of these organisations in scope?	**Micro** Yes	**Small** Yes	**Medium** Yes	**Large** Yes
What is the CO_2 equivalent change in greenhouse gas emissions? (Million tonnes CO_2 equivalent)		**Traded:** N/A	**Non-traded:** N/A	

I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.

Signed by the responsible SELECT SIGNATORY: ..... Date: _____

[1] House of Lords - Civilian Use of Drones in the EU - European Union Committee (parliament.uk)

[2] For example, one stakeholder was concerned that insurance policies currently being drawn up may not make provision for accidents arising from 'user error' leaving considerable liability on the user or the third-party.

Summary: Analysis & Evidence

Policy Option 1

Description: For the Secretary of State to be given an enabling power to make secondary legislation relating to insurance requirements for unmanned aircraft.

FULL ECONOMIC ASSESSMENT

Price Base Year	PV Base Year	Time Period Years	Net Benefit (Present Value (PV)) (£m)		
			Low: Optional	**High:** Optional	**Best Estimate:** NQ

COSTS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	Optional		Optional	Optional
High	Optional		Optional	Optional
Best Estimate	NQ		NQ	NQ

Description and scale of key monetised costs by 'main affected groups'

After initially creating an enabling power in primary legislation, secondary legislation would define the specific insurance requirements. Due to uncertainty relating to the nature of the specific insurance requirements, we have not monetised costs in this Impact Assessment ("IA").

Other key non-monetised costs by 'main affected groups'

The enabling power itself will not incur significant costs on key stakeholders. Following further secondary legislation setting out specific insurance requirements, the Civil Aviation Authority ("CAA") may incur administrative costs if required to process more insurance cases due to a rise in uptake. They will also incur familiarisation costs with the change in requirements, as will operators and insurers. Operators may face compliance costs if insurance requirements become more stringent than they would otherwise prefer.

BENEFITS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	Optional		Optional	**Optional**
High	Optional		Optional	**Optional**
Best Estimate	NQ		NQ	NQ

Description and scale of key monetised benefits by 'main affected groups'

After initially creating an enabling power in primary legislation, secondary legislation would define the specific insurance requirements. Due to this uncertainty relating to the nature of the specific insurance requirements, we have not monetised benefits in this IA.

Other key non-monetised benefits by 'main affected groups'

The enabling power can improve clarity in the regulations. This option is also enforceable and can ensure that operators who are deemed to require insurance under secondary legislation would be breaching the law if they do not comply. An increase in compliance would benefit insurers through increased insurance demand and could provide third parties with a more comprehensive compensation system. This option also provides the flexibility to define clear, future proof requirements under secondary legislation.

Key assumptions/sensitivities/risks	**Discount rate (%)**	n/a

As the impacts have not been monetised there are currently no assumptions or sensitivities.

BUSINESS ASSESSMENT (Option 1)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: NQ	**Benefits:** NQ	**Net:** NQ	NQ

Summary: Analysis & Evidence

Policy Option 2

Description: Work with industry to encourage best practice standards

FULL ECONOMIC ASSESSMENT

Price Base Year	PV Base Year	Time Period Years	Net Benefit (Present Value (PV)) (£m)		
			Low: Optional	**High:** Optional	**Best Estimate:** NQ

COSTS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	Optional		Optional	Optional
High	Optional		Optional	Optional
Best Estimate	NQ		NQ	NQ

Description and scale of key monetised costs by 'main affected groups'

Due to the uncertainty regarding the recommendations that would be made after discussions with industry were held to develop best practice standards, costs have not been monetised in this IA.

Other key non-monetised costs by 'main affected groups'

Owing to their lack of enforceability, best practice standards may not increase the adherence to insurance requirements. A large proportion of operators may therefore continue to remain uninsured, causing third parties to continue to face an incomprehensive compensation process.

BENEFITS (£m)	Total Transition (Constant Price) Years		Average Annual (excl. Transition) (Constant	Total Benefit (Present Value)
Low	Optional		Optional	**Optional**
High	Optional		Optional	**Optional**
Best Estimate	NQ		NQ	NQ

Description and scale of key monetised benefits by 'main affected groups'

Due to the uncertainty regarding the recommendations that would be made after discussions with industry were held to develop best practice standards, benefits have not been monetised in this IA.

Other key non-monetised benefits by 'main affected groups'

If the development of best practice standards is successful, this option could help to improve the clarity of insurance requirements. Once best practice standards are developed, operators may benefit from a wider range of insurance products than in the status quo, increasing the chance they can purchase a policy that meets their requirements and improving airspace safety.

Key assumptions/sensitivities/risks **Discount rate** n/a

As the impacts have not been monetised there are currently no assumptions or sensitivities.

BUSINESS ASSESSMENT (Option 2)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: NQ	**Benefits:** NQ	**Net:** NQ	NQ

Summary: Analysis & Evidence

Policy Option 3

Description: CAA providing further guidance or awareness around recommended insurance requirements

FULL ECONOMIC ASSESSMENT

Price Base Year	PV Base Year	Time Period Years	Net Benefit (Present Value (PV)) (£m)		
			Low: Optional	**High:** Optional	**Best Estimate:** NQ

COSTS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant	Total Cost (Present Value)
Low	Optional		Optional	Optional
High	Optional		Optional	Optional
Best Estimate	NQ		NQ	NQ

Description and scale of key monetised costs by 'main affected groups'

Owing to proportionality, the costs of the CAA providing further guidance or awareness have not been monetised in this IA.

Other key non-monetised costs by 'main affected groups'

This option does not introduce enforceable insurance requirements. It is therefore likely that a significant proportion of leisure operators would continue to remain uninsured if the requirements are not set by law and if they do not feel that the benefits of insurance outweigh the cost. Third parties will continue to face an inadequate compensation process. As this option does not involve enforceable requirements, the uncertainty around the legal applicability of insurance requirements for sport and recreational unmanned aircraft users would remain.

BENEFITS (£m)	Total Transition (Constant Price)	Years	Average Annual (excl. Transition) (Constant	Total Benefit (Present Value)
Low	Optional		Optional	**Optional**
High	Optional		Optional	**Optional**
Best Estimate	NQ		NQ	NQ

Description and scale of key monetised benefits by 'main affected groups'

Owing to proportionality, benefits of the CAA providing further guidance or awareness have not been monetised in this IA.

Other key non-monetised benefits by 'main affected groups'

Additional guidance and awareness from the CAA could increase the probability that operators of unmanned aircraft acquire insurance. This increase in adherence could on average lead to a more comprehensive and efficient compensation process for third parties should an incident occur.

Key assumptions/sensitivities/risks **Discount rate** n/a

As the impacts have not been monetised there are currently no assumptions or sensitivities.

BUSINESS ASSESSMENT (Option 3)

Direct impact on business (Equivalent Annual) £m:			Score for Business Impact Target (qualifying provisions only) £m:
Costs: NQ	**Benefits:** NQ	**Net:** NQ	NQ

Contents

1.0 Policy Rationale

1.1 Policy background

1. We live in an era of unprecedented change: to our businesses, our economies, and our societies. Technological advancement has become a key driver of this change, particularly following the impact of Covid-19.

2. The emergence of unmanned aircraft, including drones, and drone-powered solutions are good examples of where disruptive[1] technologies are being rapidly developed to deliver new products and services to a range of industry sectors.

3. Today, unmanned aircraft are already being used to great effect. There are almost 7,000 registered organisations with Operator IDs[2] and around 320,000 registered operators and/or remote pilots with the CAA for unmanned aircraft[3]. Unmanned aircraft are already being used to improve and deliver services in our everyday life. They come in a variety of sizes and configurations and are a springboard for innovation and improvement. The application of unmanned aircraft to everyday challenges can increase efficiency and safety, delivering better services to customers and members of the public and saving money for businesses and the public sector. For example, as part of the Drone Pathfinder Programme, Yorkshire Housing have demonstrated how unmanned aircraft can be used for building inspections, finding that they can provide more than ten times return on investment by enabling more targeted maintenance[4]. High Speed Two ("HS2") Limited have also extensively utilised unmanned aircraft, using them to survey the route, to monitor and protect local wildlife and to plant seeds to rejuvenate woodlands impacted by the construction[5]. Thanks to such use cases, the potential economic value of unmanned aircraft is large, with Pricewaterhouse Coopers ("PwC") estimating that unmanned aircraft could have a cumulative impact of £42 billion on the UK economy by 2030[6].

4. Emerging forms of aviation will create new ways to travel, create new markets, support a net zero economy and increase domestic connectivity to level up the UK. Infrastructure and other enabling technology will be needed to support these aircraft, including ground and airspace infrastructure, such as vertiports[7].

5. Our ambition is to lead the world in innovative aviation technology that has a transformative effect on the movement of people and goods, and delivers tangible benefits to communities, industry, and users. With new competing manufacturing markets opening up globally, we need to maintain our strong position and encourage the development of these new technologies for the benefit of the UK as a whole.

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[1] A disruptive technology is one that significantly alters the way that businesses operate. It may force companies to alter the way that they approach their business, risk losing market share or risk becoming irrelevant. Recent examples of disruptive technologies include smartphones or advanced genomics.

[2] An 'Operator ID' is a unique identification number provided to a person or organisation by the Civil Aviation Authority upon registering as an operator. An 'operator' is defined as "any legal or natural person operating or intending to operate one or more unmanned aircraft" and must currently be over 18 years old in the UK.

[3] CAA Drones and Model Aircraft Registration and Education Scheme ("DMARES") data, April 2022 (unpublished)

[4] https://cp.catapult.org.uk/news/the-case-for-drone-inspections-in-the-uk/

[5] https://www.newcivilengineer.com/latest/hs2-drone-use-enhances-bird-mitigation-work-28-07-2020/

[6] https://www.pwc.co.uk/intelligent-digital/drones/Drones-impact-on-the-UK-economy-FINAL.pdf

[7] https://dronelife.com/2021/03/28/what-is-a-vertiport-nuair-brings-industry-players-together-to-develop-advanced-air-mobility-strategies/

6. To ensure unmanned aircraft technology is continued to be brought to market in an integrated, safe, secure, and sustainable way we need to ensure our regulatory framework is ready and that it is also flexible enough to keep pace as technology develops. We require legislation and regulation that allows us to respond to new developments and innovations in aviation, and realise the benefits offered by this technology while empowering regulating bodies to operate effectively. Ensuring adequate insurance requirements are in place is an essential component of this.

1.2 Problem under consideration

7. Despite commercial aviation being a relatively safe activity[8], there are still variable types of risk that can be insured against e.g. third-party liability, loss, injury, loss of life etc. Other, generally smaller, types of aircraft have higher levels of risk. Unmanned aircraft may face similar types of risk, but there is much greater uncertainty about the probability and impacts of these risks due to the new nature of these aircraft e.g. a fully automated aircraft may have a relatively low probability of an accident by removing human error, but a novel aircraft may have a relatively high probability of an accident if it has not been tested. In addition, an unmanned aircraft with a low mass and no passengers may have relatively minor consequences in the event of an accident, whereas a new passenger aircraft may have relatively severe consequences in the event of an accident.

Figure 1: Calculated background crash rates (× 10^{-6} km^{-2} yr^{-1}) for Great Britain for the period 1990 to 2013[9]

Aircraft type	***Mean***	***Lower confidence limit***	***Upper confidence limit***
Light aircraft	18.5	15.1	22.4
Small transport aircraft	2.2	1.1	3.8
Large transport aircraft	0.7	0.2	1.9
Helicopters	10.3	7.8	13.4
Military combat aircraft	6.7	4.7	9.2
Total	**38.4**	**28.9**	**50.7**

8. An airprox incident is a situation in which the distance between two aircraft, as well as their position and speed, may have compromised their safety. In 2021, there were 52 airprox incidents involving unmanned aircraft systems of lower mass[10]. Occurrence reporting requires airspace users to report safety offences involving aircraft. In 2020, there were 69 high-severity Mandatory Occurrence Reports ("MORs") involving remotely piloted aircraft systems[11] ("RPAS"), with 334 occurrences in total[12]. It should be noted that these figures likely understate the true scale of incidents involving unmanned aircraft in the UK, owing to issues such as a lack of awareness around reporting requirements, a complex reporting

[8] https://www.icao.int/safety/iStars/Pages/Accident-Statistics.aspx

[9] https://www.hse.gov.uk/research/rrpdf/rr1140.pdf

[10] https://www.airproxboard.org.uk/Topical-issues-and-themes/Drones/

[11] Remotely piloted aircraft systems is an alternative term used for unmanned aircraft

[12] https://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=10827

process and a fear of being penalised [13]. In 2021, over 6,000 incidents involving drones were reported to the police [14]. As the unmanned aircraft market grows, it is likely that the number of incidents will increase, we therefore need to ensure that adequate insurance requirements are in place to protect operators from potential losses and the wider public.

9. Whilst commercial unmanned aircraft operators have a number of insurance providers, such as CoverDrone, to choose from and leisure[15] users often receive third-party cover as a part of their membership plan with organisations such as First Person View, the insurance market for unmanned aircraft is relatively young in comparison to that for other types of aircraft[16,17]. Clear requirements are therefore helpful to ensure insurance providers can successfully design insurance products that adequately reflect the risk of operation and lead to efficient outcomes. It is important for maintaining public trust and the unmanned aircraft industry's confidence that there is consistency in relevant insurance requirements and that these requirements can be adapted when needed to respond to the changing market.

10. Many of these issues were discussed in the House of Lords European Union Committee report on the Civilian Use of Drones in the EU (2015)[18] which considered the equivalence between manned aircraft and unmanned aircraft. Specifically, with regards to insurance, the report recommended that the minimum amount of public liability cover required by commercial RPAS operators under the Insurance Regulation be increased. In addition, we have anecdotal claims from other stakeholders that the mandated insurance coverage in the Insurance Regulation is not adequate[19], which could pose a risk to achieving the Government's vision for the UK market for unmanned aircraft.

11. Creating an enabling power in primary legislation will allow us to address the specific recommendation from the House of Lords, now that the Insurance Regulation is retained law, taking into account subsequent developments in unmanned aircraft law and policy. We have gathered evidence during the 2016 Safe Use of Drones consultation and the 2021 Future Flight Regulatory Review consultation, summarised below, to ensure the recommendation is still relevant.

2016 Safe Use of Drones consultation response

12. The 2016 Consultation on the Safe Use of Drones in the UK asked respondents for their opinions on insurance requirements for unmanned aircraft use. Respondents were split in terms of their support for a power in primary legislation or to work with industry to encourage insurance best practice, developing industry endorsed standards, with slightly more support for the latter. Support for working with industry over a primary enabling power included there being less chance of over-regulation, and therefore more flexibility. Support here also stated the industry led approach would allow insurance products to adapt alongside the technology,

13 https://publicapps.caa.co.uk/docs/33/CAA%20RPAS%20Safety%20Reporting%20Project%20Survey%20Summary%20and%20Results%20(CAP2357).pdf

14 National Police Chiefs Council ("NPCC") data, 2021 (unpublished)

15 Shorthand term for the concept of 'sport or recreational' used throughout this IA

16 https://www.coverdrone.com/

17 https://fpvuk.org/

18 http://www.publications.parliament.uk/pa/ld201415/ldselect/ldeucom/122/122.pdf

19 For example, one stakeholder was concerned that insurance policies currently being drawn up may not make provision for accidents arising from 'user error' leaving considerable liability on the user or the third-party.

as well as pointing out industry have already worked with insurers to develop some products for commercial unmanned aircraft. The majority of leisure users of unmanned aircraft tended to support a primary legislation enabling power. Those who supported a primary legislation enabling power option thought it might enable clearer, standardised and more comprehensive unmanned aircraft specific insurance with better enforcement. It was generally felt that insurance should be based on the level of risk posed by the unmanned aircraft and that factors such as a Maximum Take-off Mass ("MTOM") could be used to determine third-party risk. Respondents also felt that insurance should be tailored to reflect the risk profiles of different users. A common view expressed was that, as unmanned aircraft are a vehicle, insurance requirements should follow the same principles as apply to other transport modes.

2018 Taking Flight consultation response

13. In the 2018 Taking Flight: The Future of Drones in the UK Consultation we asked manufacturers and industry experts how many unmanned aircraft they predicted would be in the use in the future, giving a broad consensus that unmanned aircraft use will continue to grow to a magnitude relatively similar to Department for Transport ("DfT") estimates[20].

2021 Future Flight Regulatory Review consultation response

14. Following reasonable support in the 2016 consultation for the Secretary of State for Transport having a primary legislative power for unmanned aircraft insurance, the 2021 Future Flight Regulatory Review consultation stated the Government's intentions of giving the Secretary of State for Transport the power to provide for specific unmanned aircraft insurance requirements in secondary legislation. The consultation asked which factors and considerations the Secretary of State for Transport should be required to consider when deciding the appropriate level and applicability of insurance for new or novel aircraft, including unmanned aircraft. Although not specifically consulted on, broad support was shown for the Secretary of State to provide for insurance requirements for unmanned aircraft (as per Option 1).

15. Amongst respondents to this 2021 consultation, an especially dominant view was that insurance should be set based on the overall risk of the flight operation, taking into account its characteristics. These characteristics should include the level of injury or damage an unmanned aircraft could do to a member of the public or property, the size and MTOM of the unmanned aircraft and the flight path of the operation. There were some views that indicated insurance should also be determined by competency and/or experience of the remote pilot or based on the value of any cargo being carried. It was noted that the Implementing Regulation (EU) 2019/947 ("Implementing Regulation") uses a risk-based approach for categories of flight, and having two different approaches (i.e. by introducing insurance based on the purpose of the flight rather than setting insurance based on the risk) is confusing. This is because it can introduce an additional level of complexity that may reduce adoption and acceptance, as well as putting constraints on enforcement. A second dominant view amongst respondents was that insurance, especially for new or novel aircraft, should be set equivalent to commercial aircraft, as set out in the Insurance Regulation. Reasons for

[20] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/631638/unlocking-the-uks-high-tech-economy-consultation-on-the-safe-use-of-drones-in-the-uk-government-response.pdf

support included new or novel aircraft not gaining an undue cost advantage over conventional aircraft and to ensure equivalent safety procedures are followed for new or novel aircraft. It was mentioned that the Air Operator Certification process for new or novel aircraft is expected to be no different to manned aviation, so therefore it follows insurance should be no different to manned aviation either. There were several other specific considerations mentioned by participants, including coverage, liability regimes and enforcement.

16. There were some views that the Insurance Regulation *[by extension, the CAA's current guidance on the interpretation of the term 'model aircraft', detailed in paragraph 21']* is inadequate in terms of excluding 'recreational' and 'sporting' unmanned aircraft from the requirements of the Insurance Regulation.

17. If the users of these technologies and the general public are faced with an unreliable and / or inadequate insurance provision, this creates uncertainty and doubt, which would stymy the integration of both unmanned aircraft and any future new or novel aircraft into UK society and the realisation of the benefits they can bring. It is therefore necessary to have the ability to provide new insurance regulations.

1.3 Rationale for intervention

18. As shown in section 1.2, Problem under Consideration, there are risks associated with the operation of unmanned aircraft and they can be significant. Owing to the inherent uncertainty of the future unmanned aircraft market, it is also uncertain how these risks will be managed. To help mitigate the impacts of these risks, intervention in the insurance market is required to ensure risks can be more efficiently distributed among key stakeholders.

19. Improving the clarity and enforceability of unmanned aircraft insurance regulations will aim to mitigate the following market failures:

- Externalities – The operation of unmanned aircraft carries potentially high levels of risk, not only for operators but for third parties too. Their operation therefore imposes costs outside of the operators who choose to purchase insurance. There is also an issue of equity. In the case of an incident, there is potential for costs to fall on third-parties should they be injured. By improving the clarity of unmanned aircraft insurance requirements and increasing enforceability, we can improve compliance which can help to ensure that third parties are compensated for any damage incurred after an accident, to be paid by operators via their insurance provider. This price mechanism internalises the costs and ensures operators are liable for the risks the operation of their aircraft imposes on others.
- Information failure – Insurance providers may initially be unaware of the characteristics of each operator and thus the levels of risk involved during flight. Whilst the open, specific and certified categories of operation[21] within the Implementing Regulation broadly reflect the level of operational risk, within each is a wide spectrum of risk, primarily dependent on the use case and the size of the unmanned aircraft. In some cases, an operation in the open category could have a higher level of risk than an operation in the specific category. Insurance providers may therefore be unable to set fair prices for operators,

[21] See paragraph 30 for further details

instead setting a blanket rate. In this case, only individuals whose perceived risk is higher than the market price will purchase insurance, resulting in, under the assumption of rationality, only high risk individuals being insured. If total pay-outs therefore exceed total premiums, insurance providers will choose to exit the market and over time the market will fail. Mandating all operators to take out insurance means that providers can charge a price at the population level of risk. Since all operators regardless of operational risk have to purchase insurance, the market would succeed. By operating a similar approach to car insurance providers, adverse selection issues can be minimised. If individuals are required to provide information such as age, gender and annual mileage to calculate their premiums, insurers can build up a profile of the operator and therefore more accurately determine the level of risk, resulting in a premium that reflects this. Further to this, under the assumption of bounded rationality, operators may not currently hold insurance even if it is optimal for them to do so, owing to the time associated with balancing the risks and benefits of choosing to purchase insurance or not. Improving the clarity and enforceability of unmanned aircraft insurance requirements may help to mitigate this issue and ensure more operators who rationally should purchase insurance actually do so.

20. There is a large potential market and potentially significant risks associated with unmanned aircraft, particularly around integrating these aircraft into already congested airspace. However, there is currently too much uncertainty about how these risks will be managed, mitigated, and distributed among stakeholders. The current Insurance Regulation, stipulating minimum insurance for air carriers and aircraft operators, entered into force in 2005, and, insofar as it relates to unmanned aircraft, has not been subsequently amended since. The market for civilian unmanned aircraft has emerged and has continued to develop since that time. There are therefore some requirements set out in this regulation that were developed before unmanned aircraft became as popular and technically capable as they are today. In the commercial and private market and in the public sector too concerns have been expressed that the minimum level of insurance required by the Insurance Regulation is too low, and that it may be inadequate in other ways, such as not providing cover for some types of aircraft.

21. In addition, the CAA have provided guidance[22] that the term ‘model aircraft’ [with a MTOM of less than 20kg] used in the Insurance Regulation should be interpreted as “any unmanned aircraft used for sport or recreational purposes only” [that is less than 20kg]. The DfT and CAA acknowledge the difficulties of having guidance alone (identified in paragraphs 49 - 51) and the CAA have requested the Insurance Regulation should be amended to make applicability clearer. A 2014 European Commission study on the Third-Party Liability and Insurance Requirements of RPAS[23] also suggested that the Insurance Regulation should be amended to define the type of unmanned aircraft excluded from its scope. In addition, response to the 2021 consultation (see paragraphs 14 - 17) indicated the Insurance Regulation and the CAA’s interpretation of the term ‘model aircraft’ is inadequate and confusing in relation to leisure and sporting unmanned aircraft.

22. Intervention is therefore required in order to correct this failure, ensuring clear regulation that is proportionate and tailored to the unique characteristics of the unmanned aircraft market, and regulation that is able to be flexible to adapt to not yet developed aircraft technologies

[22] https://www.caa.co.uk/consumers/remotely-piloted-aircraft/flying-in-the-specific-category/

[23] https://op.europa.eu/en/publication-detail/-/publication/7fe87d4b-07b1-4bcd-98d1-7731842bed99

as they develop, allowing the UK market to be internationally competitive and provide for future proofing in this area.

1.4 Policy objective

23. The objective of improving and clarifying insurance requirements for unmanned aircraft is in line with the Government's levelling up agenda and wider strategic priorities of building back safer and fairer, as well as other areas of Government, for example, Department for Business, Energy and Industrial Strategy's Research & Development Roadmap and Department for International Trade's Future Technology Trade Strategy.

24. We have three main policy objectives that underpin our insurance policy design and helped to structure our questions in the 2021 consultation. These are:

    1. Design and develop insurance requirements that ensure operators of UA are obliged to take out adequate coverage and that those affected by accidents are protected.
    2. Ensure insurance requirements for unmanned aircraft are user friendly and coherent.
    3. Allow the Government to make further adaptations to insurance requirements to reflect and account for the rapidly changing market, whilst ensuring that the UK environment is internationally competitive.

1.5 Options considered

The status-quo

25. Minimum insurance requirements for air carriers and aircraft operators are mandated under the Insurance Regulation and enforcement of these requirements is provided for in the Civil Aviation (Insurance) Regulations 2005[24]. The Insurance Regulation requires most operators of aircraft (except those in excluded categories), to hold adequate levels of insurance to meet their liabilities in the event of an accident. Insurance requirements for air carriers and aircraft operators are set in terms of Special Drawing Rights (SDRs)[25];

    - Passengers at 250,000 SDRs per passenger, or 100,000 SDRs per passenger for passengers in the case of non-commercial operations by aircraft with a MTOM of 2,700kg or less:-
    - Baggage at 1,000 SDRs per passenger;
    - Cargo at 17 SDRs per kg; and
    - Liability for third parties as set out in Figure 2.

26. Air carriers and aircraft operators are required to demonstrate compliance with the Insurance Regulation by providing the CAA with a deposit of an insurance certificate or other evidence of valid insurance when required.

[24] http://www.legislation.gov.uk/uksi/2005/1089/contents/made (original version of the instrument)

[25] SDR is an international reserve asset, created by the IMF in 1969 to supplement its member countries' official reserves. At the time of writing one SDR was worth £1.04.

Figure 2: Insurance in respect of liability for third parties[26]

Category	MTOM (kg)	Minimum insurance (million SDRs)
1	< 500	0.75
2	< 1,000	1.5
3	< 2,700	3
4	< 6,000	7
5	< 12,000	18
6	< 25,000	80
7	< 50,000	150
8	< 200,000	300
9	< 500,000	500
10	≥ 500,000	700

27. In the current market for unmanned aircraft we do not see the carriage of passengers (and by extension baggage) and therefore the Insurance Regulation, insofar as it relates to baggage, will not be applicable at present, but may apply as the market develops. For example, Implementing Regulation (EU) 2019/947 contemplates unmanned aircraft operations involving aircraft capable of transporting people. An area we would expect to see growth in the shorter term is with relation to cargo.

28. An effect of the CAA's guidance is that, for unmanned aircraft with a MTOM of less than 20kg:

    - The operator of any unmanned aircraft being used commercially is required to have adequate insurance; and
    - The operator of any unmanned aircraft being used for sport or recreational purposes is not required to have adequate insurance.

29. For unmanned aircraft with a MTOM of more than 20kg, appropriate cover that meets the requirements set out above, so far as applicable, is required.

30. While this approach draws a distinction based on the purpose of an unmanned aircraft operation, legal requirements relating to the operation of unmanned aircraft more generally draw no such distinction. Those requirements apply based on three risk-based categories set out in retained Implementing Regulation (EU) 2019/947:

    - The 'open' category covers lower risk flights within visual line of sight, below 400m, where the MTOM is below 25kg and the aircraft is flown at a distance from people and property.
    - The 'specific' category covers operations which involve a higher level of risk than those in the open category and require prior approval of the CAA. A flight will be in the specific category, where one or more elements of the proposed operation would fall outside the open category requirements. When applying for approval, an operator is required to

[26] https://www.legislation.gov.uk/eur/2004/785/article/7

confirm that they will have appropriate insurance cover in place at the start of operation, if required.

- The 'certified' category covers flights of equivalent risk to manned aviation. This includes operations that, having regard to the application for approval, the CAA concludes require certification of the aircraft, the operator and, where applicable, the licensing of the remote pilot.

31. Owing to the existing requirements of the Insurance Regulation, the insurance market for commercial unmanned aircraft is fairly established in the UK with several providers. Most commercial policies include public liability insurance, whilst others may include cover for any theory or practical exams required, alongside extras such as theft, damage by a third-party or loss of an unmanned aircraft mid-air.

32. Bespoke pay-as-you-fly insurance products are also available, often operating on a per-flight or short-term basis, therefore typically used by leisure users. In some cases, leisure users may also have their unmanned aircraft covered by their existing contents insurance, however this varies by provider.

33. The unmanned aircraft market is rapidly changing and we have anecdotal claims from stakeholders that the mandated insurance coverage in the Insurance Regulation is not adequate[27] and may not go far enough in terms of coverage for some types of unmanned aircraft or not yet developed aircraft. We have gathered further evidence in the recent 2021 consultation which support these claims, which, if sound, pose a risk to achieving the Government's vision for the UK market for unmanned aircraft. Areas in which we think it is especially important to consider regarding the differences between unmanned aircraft and the aircraft and air carrier markets are:

Differing Risk Profile

34. Comprehensive coverage addressing the different risk profile of unmanned aircraft. As unmanned aircraft have a different risk profile to other aircraft there are elements of the current Insurance Regulation which may not be comprehensive enough. We are already seeing some voluntary industry standards[28] emerging which go beyond the Insurance Regulation[29] minimum insurance requirements, especially with regards to the level of public liability insurance, although this is by no means comprehensive. To ensure that public confidence in unmanned aircraft insurance standards, and by association, public trust in unmanned aircraft technology, are maintained as the market develops, we recommend further regulation to ensure that applicable insurance coverage is comprehensive and reliable. The present situation means that if an accident occurs, there is a risk that coverage is not comprehensive and that an injured member of the public may not be able to obtain adequate compensation, or do so easily, from the responsible party.

[27] For example, one stakeholder was concerned that insurance policies currently being drawn up may not make provision for accidents arising from 'user error' leaving considerable liability on the user or the third-party.

[28] This is a view from the CAA, who are provided with insurance certificates or other evidence of valid insurance for aircraft and air carriers, and have said that many have public liability insurance that goes beyond the required level set out in Regulation 785/2004.

[29] https://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=10033

Operating characteristics

35. Unmanned aircraft have unique characteristics which set them apart from other aircraft and air carriers which means they need insurance requirements tailored to their segment of the market. The risk of operation can vary significantly depending on the use case, the license application process is less stringent than for traditional aircraft and owing to the relative infancy of their use, they are not as efficiently integrated into airspace. As more complex and new unmanned aircraft-powered commercial solutions are developed, this differentiation from other aircraft and air carriers' insurance requirements will deepen.

Option 0: Do Nothing

36. Unmanned aircraft operators would continue to be required to have minimum levels of insurance as set out in the Insurance Regulation, but the legal applicability of these requirements to particular users will remain uncertain and those requirements may be out of step with the underlying risk of the operation. The proposed enabling power would ensure that the Government is able to make provision for insurance requirements for unmanned aircraft and any new related aircraft in the years ahead, clearly defining applicability to different types of unmanned aircraft.

37. If the status quo is retained, insurance requirements for unmanned aircraft will remain inadequate. The CAA's guidance on interpreting the definition of "model aircraft" within the Insurance Regulation would remain in place; therefore unmanned aircraft under 20kg used for sports or recreational use only, under which the majority of leisure unmanned aircraft are categorised, would continue to be excluded from the insurance requirements. Whilst some leisure users do currently have insurance, unless required by law it is likely that the majority would continue to remain uninsured. As the unmanned aircraft market grows, it is likely that the number of incidents involving third parties will increase. Without insurance requirements in place, these third parties will find it difficult to obtain compensation to cover the liabilities for incidents they are involved in. No change to the status quo will however avoid additional familiarisation and administration costs for the CAA.

38. Under the 'Do Nothing' option, issues with the current Insurance Regulation that have already been identified would not be rectified. As the unmanned aircraft market develops, the impact of these issues would increase and others might come to light.

Option 1: Create an enabling power in primary legislation

39. Creating an enabling power in primary legislation would allow us to put in place improved insurance requirements in secondary legislation, tailored to the unmanned aircraft market, following outputs of views and evidence from the 2016 consultation and the most recent 2021 consultation with stakeholders and the public. At this stage, the Secretary of State would only be given the power to create insurance regulations via secondary legislation (and amend them as necessary). While the precise rules the Government would wish to adopt if the Secretary of State were granted the proposed power remain to be determined, the gap between the underlying risk of an operation and the insurance requirements is one issue that might need to be addressed.

40. This option has the advantage of flexibility to make changes to unmanned aircraft insurance requirements as the use cases of these aircraft expand and the technology develops, with the ability to set strict timeframes for implementation, giving certainty on achieving the Government's vision for unmanned aircraft in the UK. This option can therefore be tailored to be future proof against new technological developments. In addition, this option also provides enforceability as it can ensure that operators who are deemed to require insurance under secondary legislation would be breaching the law if they do not comply.

41. Secondary legislation would define the detailed insurance requirements for unmanned aircraft. The specific details about the options to be considered will be analysed in greater depth at the time of drafting such secondary legislation. Setting the details in secondary legislation, when compared with setting the details in primary legislation, provides flexibility as the technology develops by allowing any amendments to unmanned aircraft insurance requirements to be implemented at a quicker pace, ensuring the legislative framework keeps pace with the expansion of the technology and use cases.

42. Some of the potential options of how insurance requirements could be set, or what they could be based on, identified through previous engagement and consultations, include:

    1. Insurance on a risk-based approach dependant on the category of operation, as detailed in the retained Implementing Regulation (EU) 2019/947. As set out above, there are three categories of risk described: the open, specific and certified. This would account for the overall risk of the operation, with potential to consider the aircraft's MTOM, flight path and whether it is carrying any cargo, amongst other factors. Some qualitative analysis of this option is considered in the below costs and benefits section.
    2. Insurance based on the relationship between risk and MTOM: this may mean that insurance requirements could be put in place which avoid placing unnecessary burden on those who use smaller / lower risk unmanned aircraft. This would also align with the current risk-based requirements for operating unmanned aircraft outlined in the retained Implementing Regulation (EU) 2019/947, where MTOM is a factor in determining the operational risk category. Within the 2016 consultation responses, three potential categories that unmanned aircraft could be grouped into for insurance purposes were indicated:
        a. Large commercially operated unmanned aircraft, which could be treated as light aircraft. This may include 'flying taxis' and other future Advanced Air Mobility innovations.
        b. Mid-weight unmanned aircraft used by a mixture of leisure users and commercial pilots
        c. Small hobby unmanned aircraft that would not require third-party insurance (as per the status quo)
    3. Having a blanket fixed minimum liability applicable to all unmanned aircraft users regardless of MTOM or category of operation. Some qualitative analysis of this option is considered in the below costs and benefits section.

4. Tailoring insurance requirements based on the competency and experience of the remote pilot of the unmanned aircraft.
5. Insurance coverage for unmanned aircraft mirroring the requirements imposed on aircraft carriers and operators of larger aircraft covered by the Insurance Regulation.

43. Further considerations or details that could be looked at during secondary legislation stage include:
    1. Clarifying the applicability of insurance requirements in the Insurance Regulation by amending the reference to 'model aircraft' and the possibility of aligning the current mass limit within that Regulation (20kg) to the upper mass limit (25kg) for the open category of flight (regulated by Implementing Regulation 2019/947). This was recommended to DfT by the CAA and could sensibly align the requirements with other unmanned aircraft legislation and rectify any potential confusion.
    2. Levels of Public Liability: The House of Lords' report recommended that the Commission increases the minimum amount of public liability cover required by commercial unmanned aircraft operators.[30]
    3. Completeness of Insurance Policies: The HL report also identified that questions were being asked as to the quality of insurance products already in use. Anecdotal evidence suggests that user-error may not be covered under traditional policies leaving considerable scope for the insurance to be rendered ineffective in such incidents.
    4. The type of insurance that would be required by the secondary legislation for different categories, i.e. fully comprehensive, third-party, fire, theft, accidental damage, loss etc.
    5. The different approaches to premiums and pay-outs, for example, setting it based on the level of risk or on a fixed limit basis, co-insurance (i.e. excess where insured also covers some of the costs) or deductibles (i.e. where small claims are not covered)

44. Overall, consideration needs to be given to which operations should require insurance, what types of insurance should be required, and what the value of that insurance cover should be, as a minimum. The Government will engage with the unmanned aircraft and insurance industries to consider the detail of the insurance requirements to help develop any related secondary legislation, ensuring that any proposed regulatory changes were proportionate.

45. International engagement could be utilised to gather further evidence on the implementation of insurance requirements for unmanned aircraft in other countries, to help inform any UK insurance requirements for unmanned aircraft.

Option 2: Work with Industry to encourage best practice standards

46. The Government already has considerable engagement with the unmanned aircraft industry and has also launched a specific Drones Industry Action Group. This is a proposal to work with the Drones Industry Action Group to ensure insurance-related products are fit for purpose. It is important to note that Option 2 and Option 3 could be taken in addition to Option 1. This option could explore with industry the options for addressing the issues that are arising and for potentially developing an industry agreed and improved standard for

[30] House of Lords - Civilian Use of Drones in the EU - European Union Committee (parliament.uk)

unmanned aircraft insurance. As with Option 1, this approach could be nuanced depending on the level of risk, or the operation, or the characteristics of the aircraft – a commonly expressed desire of respondents to the 2021 consultation. Unmanned aircraft operators looking for more confidence and certainty that their insurance policy would meet their needs could then protect themselves by only purchasing insurance from a kite-marked unmanned aircraft insurance company. There may be scope to improve the quality of offerings and deal with coverage related issues this way. Absent a legislative amendment, however, the take-up of such products could not be mandated.

47. However, this is not an approach commonly found in the insurance industry, where requirements for insurance standards tend to be mandated by law. Within this mandate, insurance providers then undertake actuarial analysis to ensure they can adequately cover liabilities. More importantly, this option would not be a comprehensive solution as there would be no legal requirement for insurance companies to meet this standard, and in the interests of competing for business and keeping prices low, many providers might choose not to offer higher levels of insurance than the standard requires. This may mean that the public could still be exposed to the risk of not being able to easily access compensation for any injuries resulting from an incident involving an unmanned aircraft. In the first instance, this option would also fail to improve the legal clarity of the current insurance regulations, which is what is required.

48. This option, like with Option 1, would have the advantage of having flexibility to make changes to unmanned aircraft insurance requirements as the use cases of these aircraft expand and the technology develops. However, unlike Option 1, we do not think it would lead to widespread coverage as its lack of enforceability may not sufficiently improve compliance, therefore this option does not provide certainty on achieving the Government's vision for unmanned aircraft.

49. Making changes to unmanned aircraft insurance requirements may be easier through this option without parliamentary processes, however there would be no legally enforceable timeframe for industry to adhere to when implementing requirements, which could take longer compared to Option 1. The advantage of more easily making changes may invite more frequent input and amendments, however this could lead to the public and industry having less confidence in the best practice standards. Option 2 has therefore been considered, and discounted.

Option 3: CAA providing further guidance or awareness around recommended insurance requirements

50. The CAA's current guidance on how to interpret the definition of 'model aircraft' within the Insurance Regulation would remain. Any supplementary guidance or awareness could only recommend insurance coverage is taken out and would therefore still mean the majority of, if not all, leisure users would not be required to take out insurance, regardless of the underlying risk of the operation. In addition, the anecdotal claims from other stakeholders that the mandated insurance coverage in the Insurance Regulation is not adequate[31] would

[31] For example, one stakeholder was concerned that insurance policies currently being drawn up may not make provision for accidents arising from 'user error' leaving considerable liability on the user or the third-party; Views expressed within the 2021 consultation.

remain, which may pose a risk to achieving the Government's vision for the UK market for unmanned aircraft.

51. Whilst some leisure users do currently have insurance, unless required by law, it is likely that the majority would continue to remain uninsured. As the unmanned aircraft market grows, it is likely that the number of incidents involving third parties will increase. Without insurance requirements in place, these third parties will find it difficult to obtain compensation to cover the liabilities for incidents they are involved in. This relatively minor change to the status quo will however ensure that familiarisation and administration costs for the CAA remain at a minimum.

52. A 2014 European Commission study on the Third-Party Liability and Insurance Requirements of RPAS[32] also suggested that the Insurance Regulation itself should be amended to define the type of unmanned aircraft excluded from its scope. This option would leave insurance requirements for many unmanned aircraft users as non-mandated. This option would also fail to improve the clarity of the current insurance regulations, which is what is required. The DfT and CAA acknowledge these difficulties of having guidance alone and the CAA have requested the Insurance Regulation should be amended to make applicability clearer. Therefore, providing further guidance or awareness alone is unadvisable and has been discounted as an option.

2.0 Costs and Benefits

Option 0 – Do Nothing

53. Given the emerging nature of the unmanned aircraft market, a great deal of uncertainty exists around the potential economic value and growth in the future. Sales data for unmanned aircraft units is not widely shared due to the commercially sensitive nature of this information and whilst unmanned aircraft are expected to add £ tens of billions to the global economy over the next decade, forecasts of future unmanned aircraft use have a wide range of uncertainty owing to different market segments, methodologies, geographies, and assumptions used. The table below summarises key literature that forecasts how big the market for unmanned aircraft could be.

54. PwC have previously estimated that unmanned aircraft could add a cumulative benefit of £42 billion to the UK economy by 2030, with 76,000 commercial unmanned aircraft in use by this point[33]. This report also estimated 628,000 drone-related jobs, including current jobs that transition to the unmanned aircraft sector, in the UK by 2030. Meanwhile, SESAR European Drone Outlook Study previously estimated 150,000-20,000 newly created drones' jobs in the UK by 2050[34]. These figures are high-level estimates and owing to the high levels of uncertainty, should only be used as such. Different segments of the market (e.g. commercial or leisure) are likely to experience impacts in different ways as we develop a proportionate policy.

[32] https://op.europa.eu/en/publication-detail/-/publication/7fe87d4b-07b1-4bcd-98d1-7731842bed99

[33] https://www.pwc.co.uk/intelligent-digital/drones/Drones-impact-on-the-UK-economy-FINAL.pdf

[34] https://www.sesarju.eu/sites/default/files/documents/reports/European_Drones_Outlook_Study_2016.pdf

Figure 3: Summary of Unmanned aircraft market forecasts

Baseline (billion)	Date	Estimate (billion)	Date	Compound Annual Growth	Unit	Geography	Market Segments	Source
N/A	N/A	GBP 42	2018-2030	N/A	GVA	UK	Commercial	PwC
EUR 0.7	2019	EUR 1.7	2025	15.9%	Revenue	Germany	Commercial, Leisure	BDL
N/A	N/A	EUR 10.6	2035	N/A	GVA	Europe	Commercial, Leisure, Military*	SESAR
N/A	N/A	EUR 14.6	2050	N/A	GVA	Europe	Commercial, Leisure, Military*	SESAR
USD 14	2024	USD 113	2030	41.6%	Revenue	Global	Delivery	Ark Invest
N/A	N/A	USD 127	2015	N/A	Revenue	Global	Commercial	PwC
USD 14.1	2018	USD 43	2024	20.4%	Revenue	Global	Commercial	Comptia
USD 26.4	2021	USD 41.3	2026	9.4%	Revenue	Global	Commercial	Droneii
USD 13.4	2020	USD 501	2028	57.3%	Revenue	Global	Commercial	Grand View Research
USD 4.5	2016	USD 6.1	2017	35.6%	Revenue	Global	Commercial, Leisure	Gartner
GBP 1	2015	GBP 5.9	2018	80.7%	Revenue	Global	Commercial, Leisure	ABI
GBP 1	2015	GBP 5.5	2020	40.6%	Revenue	Global	Commercial, Leisure	Frost and Sullivan
GBP 1	2015	GBP 27.5	2024	44.5%	Revenue	Global	Commercial, Leisure	BI Intelligence
GBP 1	2015	GBP 18.2	2025	33.7%	Revenue	Global	Commercial, Leisure	Teal Group
N/A	N/A	USD 100	2016-20	N/A	Revenue	Global	Commercial, Leisure, Military*	Goldman Sachs

*These estimates include direct (e.g. sales) and more indirect impacts (e.g. ancillary services such as insurance)

55. By April 2022, there were around 320,000 registered operators and/or remote pilots in the UK, with approximately 7,000 of these operators in the Implementing Regulation specific category[35]. Due to a lack of robust data, we use the latter as a proxy for commercial use, although it is possible that some commercial operators could be in the open category. It should be noted that this figure reflects the number of operators, not the number of unmanned aircraft as a business' operator licence covers all of its aircraft for a particular use case. These figures are also subject to uncertainty because they have significantly varied in the past few years, partly because of the emerging nature of the unmanned aircraft market but also due to changes in the legislation and related changes in the way data is collected e.g. unmanned aircraft registration was only implemented in November 2019 and the commercial/leisure categorisation changed to a risk-based categorisation at the end of 2020.

56. Using CAA data, DfT have previously estimated that there could be between 20,000 to 30,000 commercial unmanned aircraft operators by 2030, depending on the assumptions used[36]. These forecasts are highly uncertain as they depend on factors such as the growth in awareness of unmanned aircraft uses, the speed at which businesses can adapt to

[35] CAA Drones and Model Aircraft Registration and Education Scheme ("DMARES") data, April 2022 (unpublished)

[36] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/937275/future-of-drones-in-uk-consultation-response-web.pdf

technological advancements, changes in the public perception towards increasing unmanned aircraft usage and the point at which market saturation will occur.

57. As per the CAA, current aircraft insurance requirements state that aircraft operator's insurance must cover passengers, baggage, third parties, cargo and risks of war and terrorism[37]. Valued at 3.4 billion US dollars in 2020, the global general aviation insurance market is well developed, resulting in a large range of providers and policies on offer[38]. The domestic UK insurance market is the largest in Europe and the fifth largest in the world, employing approximately 110,000 people[39]. As of October 2021, there were 166 companies in the UK authorised to provide motor vehicle liability insurance[40]. Whilst we do not have any data on the size of the unmanned aircraft insurance market, after conducting some high level research of the market we expect it to form a very small proportion of the overall UK insurance market. To ensure the unmanned aircraft insurance market can develop further, we need to ensure the insurance regulations are clear and explicit.

58. The CAA is the authority to which operators of manned and unmanned aircraft demonstrate their adherence to the regulations. This process incurs administrative costs for the CAA whilst processing cases. Regardless of the option chosen, this will continue to be the case.

59. If the status-quo is retained unmanned aircraft with a MTOM under 20kg, used for sport or recreational purposes, will continue to fall outside of the scope of insurance requirements. As these technologies develop and their use becomes more common, a lack of clear guidance could lead to an inefficient system where operators are uncertain of where their aircraft fits within the regulations and where third parties find it difficult to obtain compensation after an incident.

Option 1 – Create an enabling power in primary legislation

60. In the following section we have undertaken qualitative analysis against key stakeholders, initially analysing the impact of creating an enabling power in primary legislation, before conducting more detailed analysis of the potential impacts of specific insurance requirements mandated under secondary legislation. Analysis of the specific insurance requirements is based on how the potential approach to premium calculation and the level of required cover could impact leisure and commercial operators, the insurance industry, the CAA, the Government and third parties. We have examined these two factors separately, as although they can produce insurance the product combinations, shown below in Figure 6, they can act independently too.

61. In our analysis we have considered the net costs and benefits to these key stakeholders. The costs and benefits we have considered are as followed:

[37] https://www.caa.co.uk/aircraft-register/registration-information/mandatory-insurance-requirements-for-aircraft/ , certain smaller aircraft may be exempt from requirements to have coverage in respect of the risks of war and terrorism.

[38] https://www.alliedmarketresearch.com/aviation-insurance-market-A14877

[39] https://www.statista.com/topics/4511/insurance-industry-uk/#topicHeader__wrapper

[40] https://www.statista.com/statistics/827280/number-of-insurance-companies-united-kingdom-by-sector/

Unmonetised Costs

- Administrative costs to the CAA
- Compliance costs to the CAA
- Compliance costs to commercial and leisure operators, and insurance providers
- Familiarisation costs to commercial and leisure operators, insurance providers and the CAA

Unmonetised Benefits

- Benefits to insurance providers, commercial and leisure operators and third parties from improved regulatory clarity and enforceability
- Benefits to commercial and leisure operators from facing a wider number of insurance products with competitive premiums that more accurately reflect the level of risk
- Benefits to insurance providers from facing a larger market with higher levels of demand for their products
- Benefits to third parties from experiencing a more comprehensive and efficient compensation process should they be involved in an incident

Primary Legislation

Figure 4: Stakeholder impacts key

Colour	Impact
	Positive Net Impact
	Negative Net Impact
	Ambiguous/Neutral Net Impact
	No Impact

Figure 5: Summary of impacts from Option 1

	Commercial Operators	Leisure Operators	Insurers	CAA & HMG	Third Parties
Familiarisation	None	None	None	None	None
Compliance	None	None	None	None	N/A
Benefits	Benefit	Benefit	Benefit	None	Benefit

62. By creating an enabling power, we can provide a level of certainty that insurance requirements for unmanned aircraft will be more defined and easier to understand for commercial and leisure operators, improving clarity in the regulations.

63. This option is also enforceable; therefore, the enabling power could help to increase adherence to insurance requirements. The enabling power will ensure that operators who are deemed to require insurance through the development of secondary legislation would be breaching the law if they do not comply. Whilst at the initial primary legislation stage this impact would likely be marginal, the potential resulting increase in demand for unmanned aircraft insurance would benefit insurance providers. Increased adherence could also help provide third parties with a more comprehensive and efficient compensation process should

they be involved in an accident, as well as improving airspace safety if the requirements under secondary legislation are well designed.

64. This option provides us with the flexibility to define clear requirements under secondary legislation that ensure a high level of compliance and coverage across the sector, with insurance products that meet operator's needs and accurately reflect the level of operational risk.

65. As at the primary legislation stage we are only providing an enabling power, many of the impacts upon stakeholders will be dependent on the requirements outlined under secondary legislation. We have therefore examined these potential impacts in more detail below.

Secondary Legislation

66. After initially creating an enabling power in primary legislation, secondary legislation would define the specific insurance requirements, be it by the level of insurance cover required or the insurance provider's approach to calculating premiums. At this stage, we aim to conduct a more detailed options appraisal of these requirements, quantifying the costs and benefits to key stakeholders.

67. Figure 6 presents a table illustrating the potential insurance products that could be available, according to the approach to premium calculation and the level of cover required.

Figure 6: Potential insurance product combinations

		Approach to premium calculation		
		Low (fixed limit)	Medium (per risk category)	High (per operator/flyer)
Level of cover	Low (none)	No cover, fixed limit	No cover, per risk category	No cover, per operator/flyer
	Medium (third-party)	Third-party, fixed limit	Third-party, per risk category	Third-party, per operator/flyer
	High (fully insured)	Full cover, fixed limit	Full cover, per risk category	Full cover, per operator/flyer

Level of cover

Figure 7: Summary of impacts according to the level of insurance cover required

	Commercial Operators	**Leisure Operators**	**Insurers**	**CAA & Her Majesty's Government (HMG)**	**Third Parties**
None		None	Cost	Benefit	Cost
Third party		Cost	Benefit	Cost	Benefit
Full insurance	Cost	Cost	Benefit	Cost	Benefit

Low level of cover (none)

68. If the level of required insurance cover is reduced this could lead to commercial operators choosing to self-insure or not to insure altogether as it would not be mandated, although the

overall impact is ambiguous. Without insurance, operators only have to bear the costs of pay-outs. Whilst when insured, they also have to bear the insurance provider's labour and capital costs, and their profit. However without insurance they would not benefit from the cover itself and the security and certainty it provides. Since the majority of sport or recreational unmanned aircraft are already excluded from insurance requirements, the impact upon these operators is expected to be zero.

69. The insurance industry may also be negatively impacted by this change from a reduction in demand. They may respond by exiting the market or offering new, low price insurance products to entice operators who may still wish to acquire insurance even if it is not required.

70. The CAA would still operate as the authority to which operators demonstrate their compliance with other regulations, but they would no longer need to check insurance requirements. In a case where insurance requirements are reduced it is likely there would be administrative costs savings.

71. Third parties finding it harder to seek compensation for accidents they are involved in, leading to negative impacts.

Medium level of cover (third-party)

72. If new requirements mandate third-party insurance for all operations of unmanned aircraft with a MTOM under 20kg, there would likely be a significant increase in the number of insured aircraft, resulting in an expansion of the products on offer in the insurance industry due to increased demand.

73. Owing to increased competition between insurance providers, commercial operators may benefit from insurance products at lower premiums, which they would still be able to rely on in the event of an accident although not necessarily with complete coverage. Therefore, the overall impact for commercial operators is ambiguous.

74. Since sport or recreational unmanned aircraft represent such a large proportion of the unmanned aircraft market and are therefore likely involved in the majority incidents and accidents, they will likely incur costs of familiarising themselves with the requirements and purchasing insurance, although they may also benefit from cover. The overall impact for sport or recreational operators is therefore ambiguous but may be negative if the insurance market does not yet exist.

75. The insurance industry may have to invest time in understanding the risks and costs of accidents within the unmanned aircraft industry in order to accurately price their products, incurring familiarisation and administrative costs. However, insurance companies would likely only enter the market if they could break-even, and the increased demand will likely result in net benefits to insurers.

76. The CAA would likely also face significant administration and familiarisation costs to process the new influx of unmanned aircraft operators who would be required to demonstrate compliance with the requirements.

77. Third parties may face a more convenient compensation process than previously, increasing the likelihood they are compensated. However, moral hazard issues may also arise, with some of the newly insured operators being encouraged to take more risks as they know any accidents would be covered by the insurance provider, potentially leading to more incidents. This could be mitigated by the design of the insurance products, for example by using excess to ensure operators bear some of the costs.

High level of cover (fully insured)

78. If the new requirements go further and require all operators to be fully insured, sport or recreational operators and the insurance industry would be impacted in a similar manner as for a medium level of cover, albeit with higher premiums.

79. Commercial operators of smaller unmanned aircraft would likely face more stringent requirements, facing familiarisation costs as well as costs of buying insurance. The prices faced by these operators would likely be higher than the previous third-party cover. However, commercial and sport or recreational operators may also benefit in the event of an accident. The overall impact is therefore ambiguous but may be negative if the insurance market does not yet exist.

80. The new requirements will mean insurers face familiarisation and administrative costs. However, the increased demand for full insurance products may benefit insurers by incentivising new firms to enter the insurance market. The overall impact is expected to be positive.

81. Again, as above, this change in insurance requirements would incur familiarisation and administrative costs on the CAA as they would need to understand the updated regulations and check the credibility of a high volume of insurance documentation.

82. Third parties will likely benefit from this increased coverage too, although to the same extent as where only third-party coverage is legally required.

Approach to premium calculation

Figure 8 – Summary of impacts according to the approach to premium calculation

	Commercial Operators	Leisure Operators	Insurers	CAA & HMG	Third Parties
Fixed limit	Cost	Cost	Benefit	Cost	Cost
Risk category		Cost	Benefit	Cost	Benefit
Operator/flyer	Cost	Cost	Benefit	Cost	Benefit

Low approach (fixed limit)

83. If a fixed minimum insurance limit is applied regardless of operational risk, insurance companies may impose a limit equal to or less than the price of the lowest operator's willingness to pay. Due to the wide range of risk of each flight depending on the use case, this may lead to an inefficient insurance market where insurers struggle to compensate in costly incidents resulting from high risk flights. Whilst in the average incident this shouldn't

be a problem, if particularly costly claims take a long time to be processed and resolved, third parties would find it hard to be compensated.

84. If instead insurers priced the products above the minimum willingness to pay, insurance costs may prove too high for operators flying low risk flights as they would effectively be pooled with those operating at high levels of risk, therefore requiring higher premiums for the policies to be viable. Potentially high costs may increase the risk of people ignoring insurance requirements, causing insurers to lose revenue from forgone sales and also result in third parties facing a more difficult process to receive compensation after an accident. Some responses from the 2021 consultation indicated that a blanket coverage for all is disproportionate to users of smaller unmanned aircraft.

85. High prices may also act as a barrier to growth in the unmanned aircraft market as potential sport or recreational users operating at a low level of risk may be discouraged from entering the market.

86. The CAA will also incur familiarisation and administration costs in adjusting to these new requirements.

Medium approach (per risk category)

87. If an operational risk-based approach is followed, using the open, specific and certified risk categories, insurance providers would be able to tailor products to each of these risk categories. Although this would likely come with higher costs of calculating the appropriate prices, insurance products that appropriately reflect the risks could improve compliance with insurance requirements and improve the efficiency of outcomes after an incident for third parties and operators.

88. Commercial operators in the specific category are already required to have third-party insurance, so although they may face some familiarisation costs in this scenario these would be minimal. The extent to which compliance costs would impact them is dependent on whether they would purchase an insurance product with a higher level of cover. The net impact on commercial operators is ambiguous.

89. Although predominantly operating at low levels of risk in the open category and therefore likely experiencing relatively inexpensive insurance products, sport or recreational operators would face familiarisation costs as well as the cost of the insurance.

90. Using the same risk categories that are already used in the Implementing Regulation could help to minimise their familiarisation costs and would provide clear and consistent guidance for operators.

High approach (per operator/flyer)

91. Alternatively, niche insurance products could be required according to the operator's individual use case. If a similar process to car insurance is designed where operators provide various pieces of information which are correlated with risk, asymmetric information issues can be minimised and premiums can be priced appropriately. Commercial and leisure operators would face familiarisation costs, as well as the cost of purchasing the insurance.

92. If the process was as efficient as it is in the car insurance market, third parties would experience an improved compensation process compared to the status quo.

93. Insurance providers would face short-term costs when designing and producing this mechanism, however the increase in demand for insurance products would ensure they do not operate at a loss and exit the market.

94. The CAA may face high administrative costs as it will be more difficult for them to keep track of the volume of cases, as well as the variation in details in each case regarding the operators, flyers, and their respective insurance requirements.

Option 2 – Work with industry to encourage best practice standards

Figure 9 – Summary of impacts from Option 2

	Commercial Operators	Leisure Operators	Insurers	CAA & HMG	Third Parties
Familiarisation	Cost	Cost	Cost	Cost	None
Compliance	None	None	None	None	N/A
Benefits	Benefit	Benefit	Benefit	None	Benefit

95. Under Option 2, there may be a time lag between developing best practice standards and another before implementation. Whereas under Option 1 we have more certainty over timelines, engagement with numerous industry stakeholders may be a more time-consuming process. This is not definitive however, the timelines of both options are ultimately subject to uncertainty.

96. This option is not enforceable, therefore there is no guarantee that it would lead to greater adherence to insurance requirements.

97. Insurance providers would face upfront costs in the process of working with the CAA and the Government to agree the standards. Once agreed and implemented, they would start to receive the benefits, although these would be discounted compared to the status quo owing to the time lag.

98. Commercial and leisure operators would face familiarisation costs once the standards are developed, after which they would start to feel the benefits of improved clarity in the requirements, again at a discounted rate.

99. The CAA and the Government would face the upfront costs of working with industry to develop best practice.

100. Once best practice standards are developed, third parties would benefit from an improved compensation process, however up to this point they would still face the same inefficiencies as under the status quo. They may also benefit from a safer airspace if best practice standards are used to increase safety awareness.

101. There would be no change in compliance costs across all stakeholders as there are no legally binding requirements.

Option 3 – CAA providing further guidance or awareness around recommended insurance requirements

Figure 10 – Summary of impacts from Option 3

	Commercial Operators	Leisure Operators	Insurers	CAA & HMG	Third Parties
Familiarisation	Cost	Cost	Cost	Cost	None
Compliance	None	None	None	None	N/A
Benefits	Benefit	Benefit	Benefit	None	Benefit

102. As with the 'do nothing' option, under Option 3, unmanned aircraft operators would continue to be required to have minimum levels of insurance as set out in the Insurance Regulation, but the applicability of these requirements to sport or recreational users will remain legally uncertain and only provided for in CAA guidance, therefore this options lacks enforceability. There would be no change in compliance costs across all stakeholders as there are no legally binding requirements.

103. Any supplementary guidance or awareness may however increase the probability that operators purchase insurance and adhere to existing requirements. Wider guidance or further awareness around the recommended insurance requirements from the CAA may help reduce the cost of third party liability insurance premiums, as these are likely to decrease with greater demand from unmanned aircraft users[41]. On average, this could lead to more comprehensive compensation process for third parties should an incident occur.

104. However, whilst some sport or recreational users do currently have insurance, unless required by law it is likely that the majority would continue to remain uninsured. As the unmanned aircraft market grows, it is likely that the number of incidents involving third parties will increase. Without legal insurance requirements in place, these third parties will find it difficult to obtain compensation to cover the liabilities for incidents they are involved in. Overall, whilst this option may be beneficial across the stakeholders if adherence increases, the magnitude of these benefits is subject to uncertainty and would therefore likely be fairly small.

105. This option would be quick and straightforward to implement and would only incur a small administrative cost to the CAA compared to the status-quo. Familiarisation costs will also be incurred across operators, insurers and the CAA and HMG.

106. Under this option, issues with the current Insurance Regulation that have already been identified would not be rectified. Currently, the open category is meant to reflect low levels of risk, however within this category you could still have a high-risk incident involving an unmanned aircraft with a MTOM just under the 20kg limit for example. This categorisation therefore does not capture the diversity of risk within the open category and providing

[41] House of Lords - Civilian Use of Drones in the EU - European Union Committee (parliament.uk)

additional guidance or awareness will not solve this issue. As the unmanned aircraft market develops, the impact of these issues may increase and others might come to light. As these technologies develop and their use becomes more common, a lack of clear guidance that accurately reflects operational risk could lead to an inefficient system where operators are uncertain of where their aircraft fits within the regulations and where third parties find it difficult to obtain compensation after an incident.

3.0 Risks and unintended consequences

107. There is a high degree of uncertainty in this IA, given the stage of policy development and the insurance market for unmanned aircraft being relatively underdeveloped. Therefore, this IA has not monetised any costs and benefits to reflect this uncertainty and to avoid double counting impacts when an analysis is completed for secondary legislation.

108. A significant risk is that we set a standard for insurance which leads to the insurance industry struggling to develop such products, or the price of premiums being unachievable for certain unmanned aircraft users. This could lead to insurers and/or unmanned aircraft operators either being priced out of the market or not complying with the insurance requirements. We will mitigate this risk by identifying where stakeholders consider the market failures occurring, through past consultation responses and engaging further with industry and operators where necessary. Option 1 allows us to respond in a flexible manner following past consultations with the public and industry.

109. There is also a risk that moral hazard issues develop if Option 1 is undertaken as it is possible that operators who newly acquire insurance because of the change in regulations alter their behaviour whilst operating their aircraft. They would have less incentive to avoid risky actions since they know that losses resulting from an accident will be covered by their insurer, therefore potentially resulting in more incidents. Insurers can mitigate this issue with the design of the insurance policies, for example by mandating excesses that ensure operators are liable for a minimum amount of any damage claimed. There are legal incentives that help mitigate this risk also, for example, if a person operates an unmanned aircraft in a way that endangers people, property or other aircraft, this could amount to a criminal offence.

110. Any change in regulations are likely to impact the structure of the relevant market. In the insurance market, relatively low barriers to entry will help to ensure that the market remains competitive if insurance requirements are changed, with insurers competing on price and the quality of service. At a high level we expect the unmanned aircraft insurance market to be monopolistically competitive, with a high number of insurers offering broadly similar, but not perfectly substitutable products. Owing to the market segments within the scope of unmanned aircraft however, we expect some insurance providers to target niche segments of the market as new technologies develop. Overall, we do not believe a change in insurance requirements for unmanned aircraft with a MTOM under 20kg to negatively impact the competitiveness of this market, although it could still be a risk.

111. Until specific insurance requirements are outlined and implemented under secondary legislation, which could take some time, there is a risk that a significant proportion of leisure

operators remain uninsured. This would have consequences for the ease at which third-parties are able to obtain compensation in the case of an incident. To mitigate this risk, pursuing Option 1 does not preclude the other options being undertaken in parallel or subsequently, if necessary.

4.0 Wider impacts

Innovation Test

112. By clarifying insurance requirements for unmanned aircraft at this primary legislative stage, we do not expect to initially impact innovation in the UK. The extent to which innovation is affected at the secondary legislation stage where insurance requirements are explicitly defined will depend on the type of insurance required.

113. If the insurance requirements later outlined under secondary legislation increase the cost of leisure users operating unmanned aircraft, we may expect a negative impact on demand. Similarly, higher costs may negatively impact the rate at which businesses adopt unmanned aircraft in place of their current operations. Conversely, clarity in insurance requirements could potentially increase the rate at which companies adopt drones. These impacts could impact innovation in the sector if demand is significantly altered and the market changes size accordingly. At the secondary legislative stage, we will therefore take care not to introduce requirements that could lead to a situation where insurance for unmanned aircraft becomes prohibitively costly. At this stage, a more rigorous analysis of potential impacts upon innovation could therefore be undertaken.

Small and Micro Business Assessment

114. The enabling power at the primary legislation stage aims to improve the clarity of the unmanned aircraft insurance regulation and increase enforceability, improving insurance compliance. This regulation could therefore impact commercial unmanned aircraft operators as well as the insurance industry.

115. Firstly considering the former, although the CAA do publish a list of approved commercial unmanned aircraft operators in the specific and certified categories, they do not capture information on the size of commercial operator organisations. There is therefore a lack of robust data on what proportion of commercial unmanned aircraft operators are Small and Micro Businesses (“SMBs”). Small businesses make up 99.2% of UK businesses and account for approximately 61% of employment and 52% of turnover[42]. Also included under small businesses, micro businesses make up 95% of UK businesses, accounting for around 21% of employment and 14% of turnover [43]. Whilst there are high profile examples of unmanned aircraft being used by large organisations such as Network Rail[44] and HS2[45], we assume the proportion of SMBs to be roughly equal to the UK average of 95-99% outlined

[42] https://www.fsb.org.uk/uk-small-business-statistics.html

[43] https://commonslibrary.parliament.uk/research-briefings/sn06152/#:~:text=75%25%20of%20UK%20businesses%20had,employment%20and%2014%25%20of%20turnover

[44] https://www.networkrail.co.uk/running-the-railway/looking-after-the-railway/our-fleet-machines-and-vehicles/air-operations/drones-or-unmanned-aircraft-systems-uas/

[45] https://www.bimplus.co.uk/case-study-hs2-drones-deliver-mind-blowing-measure/

above. We therefore expect the vast majority of the almost 7,000 registered organisations with Operator IDs to be SMBs.

116. The level of impact upon commercial SMB operators is dependent on the insurance requirements set out at the secondary legislation stage. If a blanket requirement is introduced for all commercial operators regardless of operational risk, this could negatively impact SMBs by pricing them out of the insurance market. This would either lead to commercial operators flying illegally without insurance or could lead to them exiting the unmanned aircraft market entirely. During policy development we therefore intend to tailor the regulation to ensure a proportionate approach to small or micro businesses, based on the level of risk of their operation. Under this approach, SMBs would face lower barriers to market entry compared to a blanket insurance rate. We also expect that insurance providers would seek to maximise their profits and, in a competitive insurance market, would compete for demand by pricing their products accordingly. We therefore would not expect the cost of insurance provision that accurately reflects the level of risk in a particular use case to be prohibitively expensive for SMBs. Furthermore, insurance payments will likely be paid on a regular basis per unmanned aircraft unit. Smaller businesses who likely have smaller unmanned aircraft fleets should therefore not face a disproportionate impact.

117. Considering insurance providers, the domestic UK insurance market is the largest in Europe and the fifth largest in the world, employing approximately 110,000 people[46]. There are 388 operators in the domestic market and as of October 2021, there were 166 companies in the UK authorised to provide motor vehicle liability insurance[47]. Whilst the motor insurance market is dominated by large organisations, with the top ten providers accounting for 84% of the UK market[48], we do not have data on the proportion of SMBs within the market. We therefore again assume that the proportion of SMBs is broadly similar to the UK average of approximately 95-99%. The extent to which SMB insurance providers are affected will depend on the insurance requirements outlined at the secondary legislation stage. If the requirements are tailored to individual use cases, this could potentially benefit SMBs who offer niche insurance products. If a blanket approach is instead chosen, SMBs may suffer if large insurance providers who have more customers and therefore a larger income stream of premium payments can afford to charge a blanket price below that which an SMB could afford to charge.

118. We cannot exempt SMBs from this regulation as we do not want to be too restrictive at this primary legislation stage. At the secondary legislation stage however, we will thoroughly consider SMB exemptions and mitigations, such as delayed implementation or transition periods for example, to ensure that any potential impacts upon SMBs can be minimised.

119. Overall, we do not expect this primary legislation measure to impact Small and Micro Businesses disproportionately, however a more thorough analysis of the potential impacts will be undertaken at the secondary legislation stage where explicit insurance requirements are defined. Whilst considering potential SMB exemptions or mitigations, we could scrutinise the interaction between the insurance requirements and their impact on commercial operator's overheads, taking into account if a disproportionate effect could be felt by SMBs.

[46] https://www.statista.com/topics/4511/insurance-industry-uk/#topicHeader__wrapper

[47] https://www.statista.com/statistics/827280/number-of-insurance-companies-united-kingdom-by-sector/

[48] https://www.statista.com/statistics/1171459/market-share-of-companies-for-motor-vehicle-insurances-in-united-kingdom/

The interaction between insurance requirements and the ease at which SMB insurance providers would be able to enter the market could also be considered.

Equalities Impact Assessment

120. This measure is not expected to impact any particular group in a discriminatory or unfair way. This is something we will consider further at the secondary legislation stage, dependent on how the specific insurance requirements relate to protected characteristics.

Justice Impact Test

121. This enabling power in primary legislation is not expected to have an immediate impact on the criminal justice system as it creates no new offences. When specific insurance requirements are created under secondary legislation, we will look at completing a justice impact test if necessary.

Competition Assessment

122. This measure is not expected to directly affect competition, as all operators of unmanned aircraft operating within the same operational risk category will be subject to the same insurance requirements.

123. There could be direct impacts on the demand for insurance however, dependent on the insurance requirements later implemented according to secondary legislation. This could potentially have an impact upon competition in this market as insurance providers would alter their behaviour when designing their products in order to capture demand and maximise their profits. Barriers to entry into new areas of the insurance market are fairly low for existing insurance firms, we therefore do not expect the magnitude of any impact to be large enough to structurally alter the market and lead to monopoly for example. During policy development we could use the secondary legislation to encourage a more competitive market for unmanned aircraft insurance.

Greenhouse Gases Impact Test/Wider Environmental

124. This measure is not expected to impact the wider environment or Greenhouse gas emissions.

5.0 Post implementation review

125. The 2016 Consultation on the Safe Use of Drones UK[49] asked respondents for their opinions on insurance requirements for unmanned aircraft use, with a split view of support for a power in primary legislation or to work with industry to encourage insurance best practice. It was generally felt that insurance should be based on the level of risk posed by the unmanned aircraft and that factors such as a MTOM could be used to determine third-party risk.

[49] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/579562/consultation-on-the-safe-use-of-drones.pdf

126. In the 2018 Taking Flight: The Future of Drones in the UK Consultation[50], although there were no insurance-specific questions, we did ask manufacturers and industry experts how many unmanned aircraft they predicted would be in use in the future. There was a broad consensus that unmanned aircraft use will continue to grow to a magnitude relatively similar to DfT estimates.

127. The 2021 Future Flight Regulatory Review[51] consultation stated the Government's intentions of giving the Secretary of State the power to provide for insurance requirements for unmanned aircraft in secondary legislation. Amongst respondents, a dominant view was that insurance should be set based on the overall risk to the flight operation, by accounting for characteristics of the operation. This should include the level of injury or damage an unmanned aircraft could do to a member of the public or property, reliability and validation of the drone, the size and MTOM of the drone and the flight path of the operation.

128. There were some views that indicated insurance should also be determined by competency and/or experience of the remote pilot, or based on the value of cargo being carried. A second dominant view was that insurance, especially for new or novel aircraft, should be set equivalent to commercial aircraft, as set out in the Insurance Regulation (EU) No. 785/2004. Reasons for support included new or novel aircraft not gaining an undue cost advantage over conventional aircraft and to ensure equivalent safety procedures are followed for new or novel aircraft.

129. In contrast, a few respondents commented that they do not support a blanket requirement of all unmanned aircraft being required to have insurance, nor a "one-size fits all" approach, as it is excessive and disproportionate. It was suggested that parties should have the option to opt into insurance if not mandated by law.

130. Due to the relative infancy of the unmanned aircraft insurance market, we do not have robust figures for the number of insurance providers or the number of operators whose aircraft are insured. As the market grows, we will continue to monitor its size and the range of insurance products on offer to operators. Figure 11 below outlines how we could answer some key research questions and close evidence gaps.

Figure 11 – Potential plans to close evidence gaps

Research questions	Evidence	Plans to improve evidence
Current and future number of UK unmanned aircraft operators?	Medium	There is uncertainty regarding the current number of unmanned aircraft in use in the UK, owing to a lack of robust data and issues such as individuals not renewing their registration. In this area, we will continue to liaise with the CAA as they improve their DMARES (Drone and Model Aircraft Registration and Education System) database which will advance our understanding of current operators. We will then be able to use this data to inform the DfT Drones Forecast Model to estimate future growth.
Current and future number of unmanned aircraft	Poor	We could continue to track the growth of the unmanned aircraft insurance market by monitoring the number of

[50] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/729458/taking-flight-the-future-of-drones-in-the-uk.pdf

[51] https://www.gov.uk/government/consultations/future-of-transport-regulatory-review-future-of-flight/future-of-transport-regulatory-review-future-of-flight

insurance providers in the UK?		insurance providers. To accomplish this, we could conduct our own research and directly communicate with providers to improve our understanding of the market.
Price of existing unmanned aircraft insurance products?	Poor	We could undertake our own research to understand the prices on offer for operators when they were looking to purchase insurance.
Level of cover for existing unmanned aircraft insurance products?	Medium	Although we do currently understand that operators in the Specific and Certified categories are required to hold third-party insurance, we do not know how many Open category operators are insured or to what extent they are covered if they are insured. We could continue to liaise with the CAA to better understand this, also conducting our own research of the market and communicating with providers.
The number of incidents or accidents involving unmanned aircraft?	Medium	Although we do have data for the number of airprox incidents and MORs the latter is not always reliable as it relies on self-reporting. We are currently supporting the CAA on a workstream to identify and respond to the barriers to reporting.
Impact on third parties of accidents or incidents?	Medium	Through the airprox and NPCC data we receive, we do have a broad sense of the regions and environments in which most incidents occur. To improve our understanding of the impact of these incidents upon third parties, we could improve our direct communication with unmanned aircraft insurance providers.
The proportion of SMB operators and insurance providers?	Poor	At the secondary legisltation stage, we could perform a more robust analysis of the unmanned aircraft market and of the insurance market, specifically focusing on the proportion of small and micro business in each. This would provide us with a better understanding of how such businesses will be impacted by the insurance requirements.
International examples of the impact of the introduction of insurance requirements on the unmanned aircraft sector?	Poor	To improve our analysis at the secondary legislation stage, we could look at other instances of insurance requirements being introduced for unmanned aircraft. Any impacts upon the sector and lessons learnt could be considered in our analysis and the policy recommendation.

131. We will put in place a more robust evaluation plan when drawing up secondary legislation, as a part of this process we could engage with the unmanned aircraft and insurance industries and international partners to obtain a more robust idea on the suitability of specific insurance products with varying levels of cover and premium calculation.