CAA CAP 1616 Options Appraisal Assessment (Phase II Full)

Title of airspace change proposal		Norfolk Vanguard and Norfolk Boreas Windfarm	
Change sponsor		Vattenfall and NATS	
Project no.		ACP-2018-03	
Case study commencement date	14/10/2020	**Case study report as at**	30/10/2020

Account Manager: [redacted]	**Airspace Regulator (Engagement & Consultation):** [redacted]	**IFP:** [redacted]	**OGC:** [redacted]
Airspace Regulator (Technical): [redacted]	**Airspace Regulator (Environmental):** [redacted]	**Airspace Regulator (Economist):** [redacted]	**ATM (Inspector ATS Ops):**

Instructions

To aid the SARG project leader's efficient project management, please highlight the "status" cell for each question using one of the four colours to illustrate if it is:

Resolved - GREEN | Not Resolved – AMBER | Not Compliant – RED | Not Applicable - GREY

Guidance

The broad principle of economic impact analysis is **proportionality**; is the level of analysis involved proportionate to the likely impact from that ACP? There are three broad levels of economic analysis; qualitative discussion, quantified through metrics, and monetised in £ terms. The more significant the impact, the greater should be the effort by sponsors to quantify and monetise the impact.

1. Background – Identifying the impact of the shortlist of options (including Do Nothing (DN) / Do Minimum (DM))			Status
1.1	**Are the outcomes of DN/DM and DS scenarios clearly outlined in the proposal?**		☒ ☐ ☐ ☐
1.1.1	Has the change sponsor produced an Options Appraisal (Phase II - Full) which sets out how Initial appraisal is developed into a more detailed quantitative assessment, moving from qualitatively defined shortlist options to the selected preferred option? [E23]	The sponsor has produced the Full Options Appraisal. However, the sponsor provided the same Initial Options Appraisal information for the do-nothing and preferred option this time excluding the discounted options in the IOA. For Level 2B changes, a qualitative assessment of fuel and CO_2 impacts of the proposed change suffices unless the sponsor anticipates an increase in fuel and emissions. Therefore, the process does not require a detailed quantitative assessment for this ACP.	☒ ☒ ☐ ☐
1.1.2	Does each shortlist option include the impacts in comparison to the 'do nothing / do minimum' option, in particular: -all reasonable costs and benefits quantified -all other costs and benefits described qualitatively -reasons why costs and benefits have not been quantified	Yes, the preferred option is compared against the do-nothing option with all reasonable costs and benefits described qualitatively. Due to the level assigned to this ACP, the quantification for environmental impact is not required and in terms of the economic assessment the qualitative assessment is found sufficient as there would be no change in effective capacity and in terms of the access there will be only 1% of GA aircraft subject to change that are transponder equipped.	☒ ☐ ☐ ☐
1.1.3	Where options have been discounted, does the change sponsor clearly set out why?	The sponsor clearly set out the reason of discounting in Stage 2A Design Principle Evaluation Document.	☒ ☐ ☐ ☐
1.1.4	Has the change sponsor indicated their preferred option in the Options Appraisal (Phase II - Full)? [E23]	Yes, the only proposed option is the preferred option which is Option D – Simplified polygon Transponder Mandatory Zone (TMZ) "rubber banded" around proposed wind farm locations extended to include a 2NM buffer.	☒ ☐ ☐ ☐

1.1.5	Does the Full Options Appraisal (Phase II - Full) detail what evidence the change sponsor will collect, and how, to fill in any evidence gaps and how this will be used to develop the Options Appraisal (Phase III - Final)? Does the plan for evidence gathering cover all reasonable impacts of the change?	No, due to the level assigned to this ACP, the options appraisal is scalable. The sponsor provided the sufficient qualitative analysis for the proposed option for all reasonable impacts.	☒ ☐ ☐ ☐

2. Direct impact on air traffic control					Status
2.1	**Are there direct cost impacts on air traffic control / management systems?** **If so, please provide below details of the factors considered and the level in which this has been analysed.**				☐ ☐ ☐ ☒
2.1.1	*Examples of costs considered (please add costs that have been discussed, and any reasonable costs that the Airspace Regulator (Technical) feels have NOT been addressed)*				
		Not applicable	Qualitative	Quantified	Monetised
2.1.2	Infrastructure changes	X			
2.1.3	Deployment	X			
2.1.4	Training	X			
2.1.5	Day-to-day operational costs / workload / risks	X			
2.1.6	Other (provide details)		X	N/A	N/A
2.1.7	Comments The Sponsor stated there are no known costs which would be imposed on commercial aviation except routine AIRAC updates to FMS and flight planning systems.				
2.2	**Are there direct beneficial impacts on air traffic control / management systems?** **If so, please provide details and how they have been addressed:**				☐ ☐ ☐ ☒
2.2.1	*Examples of benefits considered*	Not applicable	Qualitative	Quantified	Monetised

2.2.2	Reduced work-load		X	N/A	N/A
2.2.3	Reduced complexity / risk	X			
2.2.4	Other (provide details)	X			
2.2.5	Comments - no discernible benefits to ATC however by not implementing the blanking area there would be negative impact to ATC radar systems and displays and as a result a reduction in safety margins.				
2.3	**Where monetised, what is the net monetised impact on air traffic control (in net present value) over the project period?** N/A				
2.4	**Are the direct impacts on air traffic management analysed accurately and proportionately?** All the criteria listed under CAP 1616 are addressed in the IOA and qualitatively analysed in comparison with the do-nothing option which suffices for a scalable Level 2B proposal.				

3. Changes in air traffic movements / projections					**Status**
3.1	**What is the impact of the ACP on the following and has it been addressed in the ACP proposal?**				
		Not applicable	Qualitative	Quantified	Monetised
3.1.1	Number of aircraft movements		X	N/A	N/A
3.1.2	Type of aircraft movement		X	N/A	N/A
3.1.3	Distance travelled		X	N/A	N/A
3.1.4	Area flown over / affected		X	N/A	N/A
3.1.5	Other impacts	X			
3.1.6	Comments The sponsor indicated there would be no increase in effective capacity and further explained that relative difference in capacity between each of the option is not likely to affect ATC sector monitor values. In terms of GA access, the FOA states GA users without an operating transponder will have a one-off cost to access the TMZ. The cost will comprise the cost to purchase a transponder and will be circa £2,000. However, the anticipated demand from GA aircraft without				

	a transponder is minimal given the offshore location which is 47km from Norfolk coastline and the aircraft subject to change that are not transponder equipped are 1% which means the vast majority of the GA aircraft will not be impacted by this airspace change.				
3.2	**Has the forecasting of traffic done reasonably using best available guidance (e.g. DfT WebTAG, the Green Book, Academic sources…etc?)** KC: No impact expected on the volume of transponding traffic in the vicinity of the windfarm proposal site. Based on a representative traffic sample taken in 2019 only 0.16% of traffic did not operate a transponder and therefore would be expected to be impacted by this ACP.				
3.3	**What is the impact of the above changes (3.1) on the following factors?** KC: This ACP concerns the introduction of a RAG (Radar blanking and TMZ Primary Radar mitigation Scheme and is not expected by the sponsor to have any impact on transponder equipped aircraft. Work carried out as part of this ACP has been permitted to use a traffic sample taken from 1 – 14th August 2019 as representative this is accepted to be sufficient given the nature of this ACP.				
		Not applicable	Qualitative	Quantified	Monetised
3.3.1	Noise	X			
3.3.2	Fuel Burn		X	N/A	N/A
3.3.3	CO2 Emissions		X	X	N/A
3.3.4	Operational complexities for users of airspace		X	N/A	N/A
3.3.5	Number of air passengers / cargo	X			
3.3.6	Flight time savings / Delays	X			
3.3.7	Air Quality	X			
3.3.8	Tranquillity	X			
3.4	**Are the traffic forecast and the associate impact analysed proportionately and accurately according to available guidelines (e.g. WebTAG or the Green Book?)** KC: No traffic forecast provided, no expected change to fuel burn for commercial airlines GA users may incur increased fuel burn if they do not have the relevant equipage, however the likely volume of this traffic is estimated to be ~1 per day based on Primary Radar returns from which no further details is retrievable. The location of the proposed change, (47 Km offshore of the Norfolk Coast).				
3.5	**What is the total monetised impact of 3.3? (Provide comments)**				

	N/A

4. Benefits of ACP					Status
4.1	Does the ACP impact refer to the following groups and how they are impacted by the ACP?				
		Not applicable	Qualitative	Quantified	Monetised
4.1.1	Air Passengers	X			
4.1.2	Air Cargo Users	X			
4.1.3	General aviation users		X	X	N/A
4.1.4	Airlines		X	N/A	N/A
4.1.5	Airports	X			
4.1.6	Local communities	X			
4.1.7	Wider Public / Economy		X	N/A	N/A
4.1.8	Comments This Proposal concerns a development located 47km off the coast of Norfolk therefore no impact on local communities can, in addition to the location just 1 aircraft per day is expected to be impacted.				
4.2	How are the above groups impacted by the ACP, especially (but not exclusively) looking at the following factors below:				
4.2.1	Improved journey time for customers of air travel	N/A			
4.2.2	Increase choice of frequency and destinations from airport	N/A			
4.2.3	Reduced price due to additional competition because of new capacity	N/A			
4.2.4	Wider economic benefits	The introduction of the wind farm is anticipated to provide CO_2e benefits of c. 6.3 million tonnes per annum. However, this benefit is not directly an airspace change related benefit but will only be realised if the airspace change is implemented.			

4.2.5	Other impacts	Safety benefits as the change will mitigate the risk of failing to detect a potential conflict between aircraft.
4.2.6	Comments As this change is located 47Km offshore, and is predicted to impact just 1 aircraft per day communities are not expected to be impacted by its	
4.3	**What is the overall monetised impacts associated with 4.1 and 4.2 the above?** N/A	
4.4	**What are the non-monetised but quantified impacts of the above? (Insert details of description)** The only quantification is available for the portion (<%1) of non-transponder equipped GA aircraft which will be impacted by this airspace change.	
4.5	**What are the qualitative / strategic impacts described above?** The design proposal is for the implementation of radar blanking alongside a TMZ to provide mitigation solution for significant radar clutter on radar displays.	
4.6	**What is the overall monetised benefits-costs ratio (BCR) of the policy? Is it more than 1?** N/A	
4.7	**Have the sponsors provided reasonable justification for the proportionality of analysis above?** The sponsor stated in the FOA that the environmental impact assessment has been conducted on the basis of CO_2 emissions in line with the requirements for a Level 2B change and added it is not sponsor's anticipation that air traffic patterns would be impacted by the change so there would be no noise impact to stakeholders on the ground due to the location of the airspace change and therefore no analysis has been undertaken.	☒ ☐ ☐ ☐
4.8	**If the BCR is less than 1, are the quantitative and qualitative strategic impacts proportional to the costs of the ACP?** N/A	

5. Other aspects	
5.1	Nil

6. Summary of Assessment of Economic Impacts & Conclusions	
6.1	The sponsor's FOA fulfils the minimum requirement for the options appraisal for level 2B change by providing the qualitative analysis for all relevant criteria. The proposed option (Option D) would have no significant impact and underlined that the overall CO_2e benefits from the

	windfarm project will outweigh the negligible fuel burn costs to GA aircraft. The sponsor stated the optimum solution to mitigate the impact of the Norfolk Vanguard and Boreas WTGs on the Cromer primary surveillance radar system would be Option D.

Outstanding issues?		
Serial	Issue	Action required
1	-	-
2		

CAA Full Options Appraisal Assessment Completed by	Name	Signature	Date
Airspace Regulator (Technical)	[redacted]	[redacted]	15/10/2020
Airspace Regulator (Economist)	[redacted]	[redacted]	19/10/2020
Airspace Regulator (Environmentalist)	[redacted]	[redacted]	30/10/2020
ATM – Inspector ATS (Ops)			Click or tap to enter a date.