To: ACDS (Log Ops) **From: Def Logs CFD**

09 December 2019

File reference: 20191204-Future_Energy_Support_Info_Note-O

Delivering Sustainable Military Support in the Future Energy Environment - Information Note Update

Issue

1. To update you on current CFD-led work on the support implications of the Future Energy Environment to inform and drive further discussions with CDLS and other key interlocuters.

Recommendation(s)

2. ACDS (Log Ops) is invited to **note** that:

a. Current Scope is focused on the Sustainable Support Implications of Defence's ability to maintain deployable military effect in the Future Energy Environment.

b. Work remains ongoing across Defence to address this broad, sustainability-focused topic;

(1) MOD Strategy Unit (DSP) is the lead for MOD Sustainability policy;
(2) FMC is drafting a new MOD Sustainability & Energy Strategy which is scheduled to be released in early 2020 and will include reference to the government's new zero carbon emissions targets and its associated roadmap.
(3) The Sustainable MOD & Energy Steering Group (SMESG) has not met for some time but is now in the process of being 'rejuvenated'; we are tracking this as details have yet to be promulgated.
(4) DIO is the energy lead within MOD for UK and Permanent Joint Overseas Bases (PJOBs) but clear, pan-Defence, direction on the delineation of responsibility for energy is required.
(5) Current NATO direction is to focus on energy efficiency and alternative fuel measures vice seeking renewable options to fossil fuel reliance.

c. within Def Logs;

(1) CFD, supported by FLCs, DSFA, industry and academic input, is developing a Concept Note Primer that seeks to identify the Defence Support Network implications of the Future Energy Environment and the work necessary to address them.

(2) A consolidated matrix of current energy strategy, policy & governance, informed by industry, academia and DSFA, is attached at Annex A.

d. The generation of a pan-Defence informed future energy demand signal and its laydown, driven by J3, is a critical product that is key to Defence's ability to progress this work.

e. A Defence Champion for future energy should be appointed and empowered as a matter of urgency to ensure a coherent and compliant pan-Whitehall effort in achieving the breadth of Defence-wide sustainability ambitions.

3. ACDS (Log Ops) is invited to **agree** that:

a. Def Logs attendance at future SMESG forums is essential to safeguard the consideration of future initiatives against all DLODs and to ensure that support issues are appropriately represented. The extent of potential change to the ways in which Defence may have to operate drives a need for this forum to re-commence activities as a matter of urgency.

b. NATO should review its extant Single Fuel Policy stance and transitiion planning to preserve interoperability between nations in the Future Energy environment.

c. There is a need to map, metricate and understand current energy demand across the defence enterprise to correctly direct mitigation activities towards quick-wins and those offering the greatest effect.

d. Track commercial energy-related developments and then model and simulate to understand the implications on and risks to the extant deployed elements of the defence support network.

e. From a Def Logs-specific perspective, sufficient funding must be provided via UK Strategic Command to permit us to continue to pursue related work through our Logistics Development Agenda.

Timing

4. **Routine.**

Background

5. **Task.** On 7 Nov 19 ACDS (Log Ops) tasked AH CFD to identify the support implications of the Governments Greening and Net Zero 50 (NZ50) ambition and report back their findings by early Dec 19.

6. **Requirements**. Energy requirements within MOD are driven by two major factors, the energy required to achieve its strategic objectives and the requirement to meet government targets. The second of these requires a reduction and transition from current levels of fossil fuel consumption by the department. The commercial and industrial worlds are already working on replacements/alternatives to fossil fuels in every sector of current use with various horizons, primarily through electrification and substitution. Defence will therefore need to seek improvements and changes to its need for, and consumption of, fossil fuels to maintain its freedom of action and manoeuvre in future conflicts.

7. **Centre-led Work.** DIO is currently developing its scope, vision and work programme to create and publish a Net Zero Infrastructure Roadmap by April 2020. Part of this work is a new Energy Strategy which is being produced by DIO Utilities with Lt Col Mark Hill in the desk lead. Intent is that this work will address future energy requirements of the MOD fixed UK Infrastructure and PJOBs. There has also been previous activity to develop a MOD Sustainability policy, led by DSP, but the associated SMESG used to drive this work forward has not met for some time so there is a strong likelihood that momentum has been lost. We are aware that this has been recognised recently and efforts are underway to 'reinvigorate' this forum; Def Logs should seek to have a voice at the table to ensure that the Logs/Support DLOD is properly considered for any proposed future initiatives, especially regarding the requirements of the Integrated Operating Concept and Capstone Concept for Strategic Integration initiatives.

8. **Research and Technology.** Significant research has taken place in the last decade both within the commercial and defence spaces to support these ambitions, but no major progress has been made in coherently developing concepts and capabilities to allow Defence to substantively reduce its fossil fuel demand. This covers both Strat Base, all types of contingent

operations and exercise activity, noting that the largest impact is likely to be achievable in the former. The lack of a UK Defence Energy capability owner or directorate is, potentially, a major shortcoming and should be addressed as a matter of urgency. Armed with a coherent view of future energy research requirements, CDLS engagement with CSA should help to shape the broader S&T programme to support future energy in Defence, recognising that there are areas that will not be addressed by civil market such as long endurance and extreme power.

9. **International Engagement.** We are aware that your next engagement where energy is likely to be a topic for discussion is the Anglo/French talks due to take place on 30 Jan 20. Strat Plans have engaged with CFD and we will provide input to your briefing notes accordingly. In addition, as you are aware, sustainable energy will be a key feature of LOGNET 20 which presents an ideal opportunity to set out our stall with industry, academia, international allies and partners. However, it is worthy of note that our work to date has highlighted a potential anomaly between NATO Single Fuel Policy direction to pursue fossil fuel-based efficiency measures and alternative fuel options and UK industry and government's focus on renewable energy sources. This has the potential to detrimentally effect the levels of interoperability that currently exist.

Progress to Date

10. **Concept Note.** CFD has developed and is now maturing a concept note primer on Sustainable Support Implications for Defence of the Future Energy Environment. The extant product has been informed through internal Defence engagements with DSFA and TLBs and following very recent external engagement with wider MOD, industry and academia. Intent is to continue to develop this product through wider engagement and promulgate for wider staffing early in the new year. Subject to timing, our initial aim is to use the concept note primer to help inform the next version of the MOD Sustainability & Energy Strategy from a Support perspective. The concept note primer is complimented by a consolidated matrix of current energy strategy, policy & governance, informed by industry, academia and DSFA.

11. **Key Insights.** Early insights from workshops with industry and academia include:

a. Defence is considered to be a relatively small consumer of global energy with little ability to influence future trends. As such, we cannot assume that changes in the commercial support model will align with future Defence needs. For example, ROROs are unlikely to be powered by diesel in 2040 so there may be associated assured access issues at POD/POEs. In addition, alternative fuels are being developed for efficiency vice performance which is likely to lead to interoperability challenges for the more demanding platforms that we operate. Therefore, Defence will need the ability to simulate and model these effects to help drive future work and to make informed capability decisions. Furthermore, an achievable transition plan will be a key supporting requirement.

b. The likely increased reliance on battery power requires assured access to sufficient rare earth elements to achieve necessary levels of resilience. In addition, a suitable disposal capability must also be developed; we have been advised that, at present, the latter (noting a current Li-ion car battery has a useful life expectancy of circa three years), has yet to be addressed by industry. As such Defence must ensure that by 'fixing' one problem it does not create another.

c. There may be a need to consider an interim 'blended' force approach that, by necessity, requires a 'fleets within fleets' solution. This could, for example, comprise electric powered capability as a default for Defence activity, e.g. training, with fossil fuel-powered capability being employed only where greater performance and endurance demands exist. This would, in turn, challenge extant 'train as we fight' and capability management models.

Planned Next Steps

12. **Demand Signal.** One critical product that requires a Defence-wide effort, but led by J3, is the generation of a future energy demand signal, including laydown; this has been a consistent theme from our wider engagement activities but especially with industry reps. From a Support perspective, this is key to being able to understand the potential associated power provision and distribution requirements and inform the Future Support Operating Concept that will seek to determine how we might achieve these tasks.

13. **Testing.** We will also continue to refine our understanding of delivering sustainable military support in a future energy environment challenge. Our intent is to use our proven LOGNET sub-working group forum approach to further test the product and embark on work to prove/disprove its embedded benefits realisation hypotheses and assumptions.

Summary

14. Significant work is being undertaken across Defence but clear leadership, delineation of responsibilities and a pan-Defence informed future demand signal are the key priorities at present. CDLS engagement is vital to ensure that Sustainable Support Implications of Defence's ability to maintain deployable military effect in the Future Energy Environment are recognised and shaped accordingly to drive associated transition planning. CFD will continue to refine its products and would welcome any further D&G you can provide following your future engagements with key interlocuters, allies and partners.

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Annex A:

Matrix of Current Energy Strategy, Policy & Governance.

Copied to:

Hd Def Log Strat

MA to ACDS (Log Ops)

AH CFD

AH DSFA

DH Strat Plans

AHd JFC SciA

Annex A: Matrix of Current Energy Strategy, Policy & Governance

	DSP/MOD MB	**DCDC**	**FMC/MOD MB**	**Def Log**	**D Sp Tx**	**DIO**	**HQ Army**	**NCHQ**	**HQ Air**	**JFC**
Strategy	Defence Climate Strategy (in development) (2035 horizon)	Global Strategic Trends - The Future Starts Today Future Operating Environment 35	Capability Energy Strategy Sustainable MoD Strategy - Act and Evolve (2015 to 2025) Waste Management (2015 to 2025)		Draft Support Strategy (with CDLS)	Long Term Energy Strategy (incl Net Zero Infrastructure Roadmap (Apr 20))				JFC 2017 Sustainability Strategy
Policy	DSD Guide on Sustainable Development in Submissions (2012)		JSP 850 Infra & Estate Policy JSP 315 Bldg standards & Tx to NZ50 JSP 418 – Mgt of Env Protection in Defence	DLD?			Command Plan	Command Plan	Command Plan	Command Plan JFC Sustainability Delivery Plan
Governance	ICSB Defence Safety & Environment Ctee		SMESG (not held since 2018) SMEWG (Scheduled Jan 20)	DLFDB DFSG (Fuels only)	DLFDB	Sustainable Development Charter between DIO and industry DIO Suppliers' Sustainable Development Working Group		Navy Command Energy Efficiency Board (NCEEB)	Site	
Target setting	via DP		Greening Government Commitments targets Via DP Pan-Govt 25% Electric Veh (EV) target by 2022	DLD?		via DP	Efficiency targets to Units via DP	Efficiency targets to Units via DP	Efficiency targets to Units via DP 2 Gp Fuel efficiency and emissions reduction mandate	Efficiency targets to Units via DP

	DSP/MOD MB	DCDC	FMC/MOD MB	Def Log	D Sp Tx	DIO	HQ Army	NCHQ	HQ Air	JFC
R&D		Climate Change prediction Research		Future Energy Concept Note			Army Advanced Development Programme sust ainability sprint remit to develop 3 COAs for carbon reduction/ sustainability It will address both estate and capability energy.	DST Tech Experimentation Plan DST 'think piece regarding how S&T can support MOD meeting the 'green agenda' and new legislative targets Efficiency Metrics - Coherence modelling		
Initiatives	Sustainable MoD Annual Reports		MOD Sustainable Development Hub Hybrid/electric vehicle utilisation within PHOENIX II (White Fleet contract)	Introduction of Synthetic blends into DEFSTAN 91-091 (Avn Fuel)			Army Field Power Smart Grid (Powering the Battlefield" Technology Demonstrator and the Field Army' ARRC Power Project) Army Sustainability, Efficiency and Exploitation Team - Projects PROMETHIUS (Solar), EPC (RMAS trial) and TAURUS(Solar Car Port)		2 Gp Fuel efficiency and emissions reduction Bioprocessing system - pilot	
Collaboration		Future Force Sustainability Strawman paper/JCN (draft)		Logs Futures Working Group						