



**WEBINAR REPORT**

# State, Defence Industry and Energy Transition

April 26th, 2024

## ABOUT THE EVENT

Webinar: “[State, Defence Industry and Energy Transition](#)”. Held on April 26th, 2024. Available at the Sovereignty and Climate Center’s YouTube channel.

The event is part of the Webinar Series “Climate, Sustainability, and Defence”, held in partnership with the NETZMIL Project (Loughborough University, United Kingdom) and the Training Center on Defence Economics and Force Development (NCAD/ESD).

## Participants



**Victoria Doherty.** Head of Customer Engagement in Electrification and Sustainability at QinetiQ’s Central Technology Office. Her passion for mediating conversations across technical disciplines and practical challenges has led her to work in human factors, cybersecurity, energy, and sustainability. She is a certified Ergonomist and has been with QinetiQ for over 18 years. In this session, Victoria will reflect on the opportunities and challenges that climate change and the energy transition bring to defense.



**Valmir Dias.** Climate and Energy Professional with a focus on government relations and low-carbon transition. His sectoral background spans government, international trade, and the financial market, where he consolidated the issuance of Brazil’s first green bond for an energy distribution company. He currently serves as an Energy Policy Officer to the UK Government.



**Roberto Gallo.** CEO of Kryptus. President of the Brazilian Association of Defense and Security Materials Industries. He holds a degree in Computer Engineering from the State University of Campinas (2001), a master’s degree in Computer Science

from the State University of Campinas (2004), and a doctorate in Computer Science from the State University of Campinas (2012). He has experience in Computer Science, with an emphasis on Computer Systems Architecture.



**Dr. Peterson Ferreira da Silva.** Federal Higher Education Teaching Career Professor at the Brazilian Defense College (ESD) since 2018. Professor of the Graduate Program in Aerospace Sciences at the Air Force University (UNIFA) since 2022. PhD from the Institute of International Relations at the University of São Paulo (IRI-USP/Pró-Defesa III). Specialist in Public Management from the Foundation School of Sociology and Politics of São Paulo. Master’s degree from the San Tiago Dantas Graduate Program in International Relations (UNESP, UNICAMP, and PUC-São Paulo/Pró-Defesa I). Volunteer researcher at the Pandiá Calógeras Institute of the Ministry of Defense between 2015 and 2016. Associate researcher at the Army Strategic Studies Center between 2016 and 2018. Coordinator of the Defense Economy and Force Development Training Center (NCAD) at the Brazilian Defense College (ESD) since 2020.

## Introduction

One of the greatest issues faced by the defence industry is the need for an urgent transformation of its evolutionary baselines, dependent on fossil fuels, into a resilient and efficient structure from the energy standpoint. Consequently, this report's analysis aims to guide public agents, identifying crucial components that must be considered for the sector's energy transition planning. Those observations are part of the third webinar on the series "Climate, Sustainability and Defence," organised by the Sovereignty and Climate Centre in partnership with the Defence Economics and Force Development Centre (NCAD) of the Brazilian Defence College (ESD) and the NETZMIL Project, with the support of the Associate Vice-Chancellor of Loughborough University (UK) and the Brazilian Association of Defence and Security Materials Industries (ABIMDE).

The webinar was centred on three main questions: how can the public and private sectors collaborate to drive the adoption of clean and sustainable energy sources while simultaneously ensuring national security? What are the main opportunities and challenges the defence industry faces in adapting to energy transition demands, and how can the state support those efforts? And how can research and development of advanced energy technologies in the defence sector contribute to innovation in other sectors of the economy, promoting a broader and more sustainable energy transition?

To answer these questions and discuss the challenges and opportunities the climate change agenda brings to the countries' security and defence, the speakers' contributions included current perspectives based on the actions of the Brazilian and British governments, as well as analyses of the technologies employed in facing and mitigating the effects of such changes. During the debate, Victoria Doherty, Head of Consumer Engagement in Electrification and Sustainability at QinetiQ, highlighted the need for a strategic and collaborative approach to mitigating the impacts of climate change, with emphasis on the integration of new technologies and coordinated action. Roberto Gallo, President of the Brazilian Association of Defence and Security Materials Industries (ABIMDE), discussed the importance of decarbonising the Brazilian defence sector, mentioning incoming legislation on sustainable fuels and the need for a strategic entity to coordinate environmental policies. Valmir Dias, Energy Policy Expert at the British Embassy in Brazil, emphasised international cooperation and the implementation of emissions trading systems such as the Emissions Trading Scheme (ETS) as ways to promote energy sustainability and security, highlighting the importance of partnerships and technological innovation. Each speaker stressed the need for inter-sector and international cooperation, continuous innovation, and effective policies to attain a sustainable and resilient energy transition.

In its analysis, this report has attempted to capture the speakers' contributions, who indicated the problems in their respective fields, presented potential solutions, and proposed methods to implement them. Finally, we have included a table of recommendations of measures Brazilian defence may take to prepare its structure to face the effects of climate change.

### **KEYWORDS**

Defence Industry; Energy Transition; Climate Change; Sustainable Industry.



## WEBINAR REPORT

# State, Defense Industry, and Energy Transition

## 1. Promoting Resilience and Innovation in the Defence Industry: Challenges and Opportunities in Global Energy Transition

Victoria Doherty, Head of Consumer Engagement in Electrification and Sustainability at QinectiQ, highlighted the importance of a strategic approach in implementing energy transition and facing the challenge of minimising the impacts of climate change, stressing the need for collaboration and innovation in the security and defence sector. She argues that transitioning to a sustainable future requires the involvement of all interested parties, investment in new technologies, and an integrated approach to implement resilient and efficient solutions. Doherty also emphasised that continuous and coordinated action is necessary to attain sustainability and global security objectives.

She observes that although sustainability in the defence sector is not new, its strategic importance has increased significantly in recent years. Previously, the objective was to reduce the harmful effects of existing plans; today, plans must be revised based on the impacts of tragedies stemming from climate change. She explains:

“I think if we start out talking about defence, security, and sustainability, the main place I would start is by saying this is not new. For many years, defence has looked at environmental protection and recognised the importance of minimising harm. But what we’ve seen over the last two, three years is a new level of strategic importance and a recognition that perhaps where we might previously have said, ‘here’s the plan, now minimise the negative impact,’ now we’re stepping up a level and saying ‘well, maybe we need to change the plan,’ because we understand that the context in which we’re operating is different.”

Victoria Doherty provided an analysis of the issues faced by the defence industry amid a global energy transition. She discussed the role of the public and private sectors in promoting clean and sustainable energy sources, as well as the importance of inter-sector and international cooperation to drive innovation and resilience in the face of climate change. The following table brings the main points she addressed, focusing on the identified challenges, proposed solutions, and approaches to adopt these solutions.

In sum, Victoria Doherty clarified the complexity of the challenges faced by the sector and the importance of collaborative and innovative approaches to face the challenges of energy transition in the defence industry. By integrating sustainability considerations in all areas of action, defence may not only mitigate environmental impacts but also strengthen its resilience and operational effectiveness in a world undergoing quick and unforeseeable changes. International cooperation and the commitment to innovation will be fundamental in achieving a broader and more sustainable energy transition.

**Table 1.** Challenges and Solutions for the UK

CHALLENGES	SOLUTIONS	APPROACHES
Energy resilience and efficiency	Adoption of new technologies to create more efficient and resilient energy systems.  Implementation of advanced technologies that make use of renewable energy sources.	1. Stimulating the implementation and experimentation with emerging technologies, such as renewable energies and energy storage systems, to replace traditional energy solutions. 2. Developing distributed energy systems to reduce dependency on traditional logistic chains.
Innovation and international standards	Continuous update of standards and regulations to support sustainable innovations.	1. Working in collaboration with international entities to update defence standards and incorporate the most recent sustainability requirements. 2. Introducing sustainability requirements in equipment design and manufacturing standards.
Systems interconnectivity	Development of a modular approach to ensure efficient interconnectivity of new technologies.	1. Adopting common and interoperable connectivity standards. 2. Promoting modularity in defence systems to facilitate the integration of new technologies and ensure that new developments can be easily integrated with existing ones.
Pressure from shareholders and employees	Incorporation of questions on social value and energy resilience in project specifications and their involvement in decision-making criteria.	1. Integrating sustainability and social responsibility criteria in procurement and project development. 2. Involving shareholders and employees in strategic decisions on sustainability.
Education and skill development	Collaboration with academia to develop essential skills for energy transition.	1. Implementing educational programmes focused on new sustainable technologies. 2. Establishing partnerships with academic institutions for research and development in critical areas.
Climate and operational predictability	Promotion of digital tools and modelling to predict climate scenarios for operations in variable and extreme environments.	1. Using advanced modelling and simulation tools to assess climate impacts in defence operations. 2. Developing and training with simulated scenarios to prepare for extreme climate events.

## 2. Defence Industry’s Challenges, Solutions, and Paths for Implementing and Ensuring Energy Sustainability in Brazil

In his presentation, Roberto Gallo, President of ABIMDE, addressed the Association’s perspectives regarding decarbonisation and energy transition in the Brazilian defence sector. He emphasised that energy production in Brazil is mainly sustainable, with 83 to 85 per cent coming from renewable sources. Gallo mentioned *Indústria de Material Bélico do Brasil* (Imbel), which already has 100 per cent of its energy generated by hydroelectric plants, as a model to be followed. He also discussed the immediate importance of adopting sustainable aviation fuels (SAF) to reduce CO2 emissions in civil and military aviation. He stressed that the US is the largest global fuel consumer, responsible for about 5.5 per cent of the fuel consumed by defence.

Gallo emphasised the importance of incoming legislation on the “fuel of the future”, which should enable large investments in sustainable fuels, as well as the state’s vital role in regulation and stimulating innovation. He mentioned the lack of long-term strategic coordination between several ministries and entities as a significant challenge and defended the creation of a permanent entity to coordinate strategic actions. He states:

“We have to remember that environmental issues, just like defence issues, are naturally cross-cutting. They require coordination between several agencies, entities, and elements of political life for them to be effective. [...] However, the Ministry of the Environment is not

capable of strategically resolving or coordinating all the necessary pieces for that to work. And today in Brazil — actually, for a while in Brazil — we haven’t had an entity whose mission is strategic thinking, coordinated with all who are responsible, or who have some influence, or who execute a policy. [...] If something can prevent Brazil from being an environmental power, it’s precisely that, it’s the lack of long-term strategic coordination.”

Roberto also discussed nuclear energy as a viable alternative for constant energy generation, stressing the importance of maintaining Brazil’s potential for nuclear research and development. In addition, he warned about the risk of the energy transition agenda creating a divide between rich and poor countries, underscoring the importance of a balanced and inclusive approach to sustainability in the defence industry. In Table 2, we have highlighted the main points addressed by the speaker:

**Table 2.** Challenges and Solutions for Brazil

CHALLENGES	SOLUTIONS	APPROACHES
High fuel consumption in defence	Development and use of sustainable aviation fuels (SAF).	<ol style="list-style-type: none"> <li>Investing in technologies for the efficient production of sustainable fuels.</li> <li>Using the Brazilian potential due to the high solar incidence and favourable climate.</li> </ol>
Lack of specific legislation for sustainable fuels	Approval of the “fuel of the future” legislation to attract investment.	<ol style="list-style-type: none"> <li>Engaging the National Congress and stakeholders to speed up the legislation’s approval.</li> <li>Creating fiscal incentives and subsidies for companies that invest in sustainable fuels.</li> </ol>
Fragmented coordination between government entities	Creation of a permanent institution in charge of strategic coordination.	<ol style="list-style-type: none"> <li>Establishing an entity in charge of coordinating environmental and defence policies.</li> <li>Promoting a long-term strategic vision for environmental actions.</li> </ol>
Budget challenges for the Armed Forces	Increasing the budget for procuring sustainable equipment.	<ol style="list-style-type: none"> <li>Redirecting resources to reequip the Armed Forces with technologies with low environmental impact.</li> <li>Implementing funding programmes and public-private partnerships.</li> </ol>
Dependency on international technology	Fostering research and development of national technologies.	<ol style="list-style-type: none"> <li>Establishing incentive programmes for technological innovation in partnership with universities and research centres.</li> <li>Facilitating the return of Brazilian scientists so they can develop technologies locally.</li> </ol>
Risk of inequality in energy transition	Promotion of policies that incentivise local technological production and development.	<ol style="list-style-type: none"> <li>Promoting international collaboration for technology transfer.</li> <li>Developing a national strategy that values production and exploration of domestic technology.</li> </ol>

In sum, Roberto Gallo highlighted the importance of decarbonisation and energy transition in the Brazilian defence industry. He identified significant challenges, such as high dependency on fossil fuels and fragmentation of government coordination. Proposed solutions include developing sustainable fuels, passing specific legislation, and creating a permanent strategic coordination entity. These actions are crucial to ensure that Brazil can fully benefit from the global energy transition, continuing to be competitive and sustainable.

### 3. Challenges, Solutions, and Approaches to Energy Transition and National Security in the UK and Brazil

Valmir Dias, Energy Policy Expert at the British Embassy in Brazil, highlighted the crucial importance of energy transition to national security and economic sustainability in the UK and Brazil. He mentioned that reducing dependency on fossil fuels increases energy security, reduces economic vulnerability, and contributes to mitigating climate change. Valmir emphasised the UK's commitments to reducing greenhouse gas emissions, including implementing the Emissions Trading Scheme (ETS) to reduce emissions in key sectors. As he explains, the ETS establishes emissions caps and forces companies to acquire permits to emit carbon, with progressively higher costs, stimulating emissions reduction. The revenue generated finances low-carbon projects, promotes technological innovation, and aims to improve energy security.

“The UK has implemented a bit of a broader system, one that is considered to be at the vanguard globally, the Emissions Trading Scheme (ETS), that aims to reduce greenhouse gas emissions in the main sectors we've discussed here today, which are energy, industry, and aviation. The way this system works is by implementing some greenhouse gas emissions caps to these specific sectors I've mentioned, and companies must acquire permits to emit carbon. And the prices for these permits rise with time, stimulating companies and sectors to actually reduce their emissions. This is very important to, let's say, keep the economy running because it creates a financing system for low-carbon projects.”

He also explained how implementing emissions-trading schemes, such as ETS in the UK and the Brazilian Carbon Credits System (SBCC), may be fundamental to finance low-carbon initiatives. He highlighted existing challenges, like the complexity of energy transition and the need for effective regulation for a carbon market in Brazil, emphasising the importance of a collaborative and balanced approach between developing and developed countries to attain global energy sustainability.

Another point he made was about the UK-Brazil cooperation in low-carbon technologies, such as batteries and vehicle electrification, as well as investments in energy efficiency and renewable energy. In this sense, Valmir affirmed the relevance of international research and development cooperation, highlighting partnerships in nuclear energy and advanced technologies with companies such as BAE Systems and Embraer.

The following table presents the main issues discussed by the speaker, as well as proposed solutions and approaches:

**Table 3.** Challenges and Solutions for Brazil

CHALLENGES	SOLUTIONS	APPROACHES
Dependency on fossil fuels	Reduction of emissions in the defence sector.	<ol style="list-style-type: none"> <li>1. Implementing specific policies and fiscal incentives.</li> <li>2. Investing in Research and Development (R&amp;D) for low-carbon technologies and in the electrification of vehicles in the defence sector.</li> </ol>
	Definition of clear targets for reducing energy consumption and increasing the use of renewable energy, with a focus on the defence sector and incentives for low-carbon technologies.	Establishing specific government policies, providing fiscal incentives, and creating oversight and progress-report mechanisms.
High cost, complexity, and update of preexisting infrastructure	Expansion of partnerships and international cooperation.	Strengthening cooperation between the UK and Brazil in critical minerals and defence technology by establishing joint research centre financing projects, creating research exchange programmes, and funding sustainable technology R&D projects through bilateral agreements.
	Promotion of an international fund to finance energy projects in developing countries, reducing risks and investment costs.	Establishing international funds, stimulating technology transfer, and creating policies that promote collaboration between developing and developed countries.
	Stimulate R&D initiatives.	Supporting R&D in new energy technologies and cooperating internationally in R&D, especially on nuclear energy and advanced technologies.
Lack of regulation in the carbon market in Brazil	Implementation of systems such as the Emissions Trading Scheme (ETS) and the Brazilian Carbon Credits System (SBCC) to cap emissions and stimulate reductions.	Developing a robust and transparent regulatory environment, providing institutional security, and promoting the inclusion of different sectors in the carbon market.
	Creating a robust regulatory environment for the carbon market and international mechanisms to reduce costs and increase energy security.	Implementing clear regulation, providing incentives to sustainable investments, and promoting international cooperation for capital cost reduction.

In sum, Valmir highlighted the importance of a cooperative and integrated approach to face the challenges of energy transition. The alignment between government policies, technological innovation, and international partnerships is essential to ensure an effective and sustainable energy transition, benefitting both developed and developing countries.

## 4. Opportunities for National Defence in Brazil

The Table below contains a set of strategic opportunities for Brazilian national defence, focusing on sustainability and climate resilience, to emphasise their respective importance to the defence sector. It also provides recommendations to foster technological innovation, strengthening cooperation between interested parties, and ensuring that defence operations are increasingly more efficient and environmentally sustainable.



OPPORTUNITY	DESCRIPTION	IMPLEMENTATION
Strengthening multi-sector collaboration	Promoting synergy between companies, startups, academia, and governments for innovation in sustainability and defence.	Establish joint projects where connectivity between the common objectives is at the core of decision-making, promoting interoperability between the parties involved.
Investing in education and skill development	Establishing educational programmes focused on new sustainable technologies and modern defence methods.	Implementing specialisation courses in renewable energies and defence engineering in military universities. Additionally, developing partnerships between different Brazilian and international universities to build projects with these objectives.
Adoption of sustainable technologies	Implementing new technologies that increase energy efficiency, and reducing the operational footprint of defence operations.	Prioritising equipment driven by renewable energy.
Updating standards and regulations	Working on continuous upgrades to international standards to incorporate sustainability and climate resilience matters.	Revising rules for the construction of military bases to include energy efficiency requirements.
Implementation of resilient energy systems	Developing energy systems that can operate under extreme and less predictable climate conditions.	Installing self-sufficient and adapted networks.
Creation of a permanent coordination entity	Establishing an entity in charge of coordinating environmental and defence policies.	Creation of a Sustainability Secretariat within the Ministry of Defence, which will be responsible for conducting and mobilising environmental actions within the Armed Forces. This Secretariat should promote training courses, draft strategic documents, and coordinate initiatives with other national and international institutions.
Fostering national research and development	Stimulating technological innovation in partnership with universities and research centres.	Developing funding programmes for sustainable dual use technologies in Brazilian Universities and Science and Technology Institutions.

## 5. Conclusion

In the three events held by the Sovereignty and Climate Centre, all speakers focused on a common point: energy transition in the defence industry is a critical necessity to ensure sustainability and national security in a world facing polycrisis and transforming due to climate change. Thus, the recommendations presented herein aim to guide Brazilian defence to take measures that ensure preparation and adaptation to the new energy and environmental demands, seeking to promote a safer and more sustainable future.

For this, we need a sustainable and resilient energy transition that values inter-sector cooperation, continuous innovation, and effective implementation of policies. Still, it is necessary to recognise that the path to implement such measures poses a series of challenges, like a high dependency on fossil fuels, the fragmentation of government coordination, the Brazilian defence industry's low competitiveness, and the limited budget for investments.

However, recognising the existence of these obstacles must not result in immobility for defence or in a justification to continue using the same strategy. What has been proposed throughout the events and reports is that these obstacles must be seen as a catapult to boost transformation and action in the defence sector.

In this regard, regulation and incentives for innovation are essential state functions to promote sustainability. Specific initiatives, such as the "fuel of the future", and systems like the Emissions Trading Scheme (ETS) can potentially attract investment and support energy transition, even beyond the scope of defence operations.

Additionally, the implementation of Research and Development (R&D) policies centred on complex energy technologies in the defence sector may have a significant impact on innovation for other economic sectors. Educational programmes focused on new sustainable technologies and collaboration with academic and scientific institutions are essential, as well as developing the necessary skills for the transition.

Lastly, the defence industry must change in order to ensure a safer and more sustainable future. The suggestions aim to guide Brazil's defence in implementing actions that ensure preparedness and adaptation to new energy and environmental demands to continue working to maintain national sovereignty. ■

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### Administrative Assistant

Leandra Barra

### Autorship

Polianna Almeida

### Revision

Mariana Nascimento Plum

Mila Campbell

Peterson Ferreira da Silva

Tamiris Santos

### Translation

Guilherme Monteiro

### Graphic Design and Layout

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