**Executive Summary
Proposal for a New IEC Work Item
FLAS – Fan Local Area System**

1. Purpose of the proposed standard

This proposal introduces **FLAS (Fan Local Area System)**, a system-level standard defining the fundamental architectural, communication, and behavioral characteristics of intelligent fan microgrids.

The objective of the proposed IEC standard is to establish a **common, open, and interoperable framework** for fans and similar air-moving devices operating within **Low Voltage Direct Current (LVDC)** environments, with particular emphasis on:

- plug-and-play operation;
- coordinated system-level behavior;
- support for digitalization and artificial intelligence;
- interoperability across manufacturers and implementations.

The proposed standard addresses a gap between existing component-level standards and the emerging need for **system-oriented ventilation solutions**.

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2. Market and regulatory relevance

Ventilation systems represent a significant share of global electricity consumption and play a critical role in building and industrial energy performance.

Ongoing transformations in the energy and building sectors are driven by:

- electrification of heating, cooling, and ventilation;
- increasing adoption of LVDC distribution;
- regulatory frameworks such as **Zero Emission Buildings (ZEB)** and **Energy Performance of Buildings Directive (EPBD)**;
- growing deployment of Building Automation and Control Systems (BACS);
- integration of intelligent and AI-based optimization functions.

Despite these developments, current ventilation solutions are typically designed as **isolated devices**, resulting in:

- fragmented system architectures;
- complex installation and commissioning;
- limited interoperability;
- underutilization of system-level optimization potential.

The proposed FLAS standard responds directly to these challenges.

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3. Scope and positioning of the standard

The proposed standard focuses on **system architecture and behavior**, not on specific products or technologies.

It defines:

- system-level roles and domains;
- mandatory behavioral models, including lifecycle states and plug-and-play operation;
- minimum communication capabilities required for interoperability;
- conformance levels enabling gradual adoption.

The standard deliberately **does not** prescribe:

- specific hardware components;
- communication protocols or physical media;
- AI algorithms or cloud services;
- safety or electrical protection details already covered by existing IEC standards.

This positioning ensures:

- long-term technological neutrality;
- compatibility with existing and future IEC standards;
- openness to innovation and vendor differentiation.

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4. Technical novelty and contribution

The key innovation of the proposed FLAS standard lies in its **behavioral standardization approach**.

Rather than defining a new protocol or device type, FLAS introduces:

- a formal lifecycle model for fan devices within a microgrid;
- standardized plug-and-play behavior for ventilation systems;
- clear separation between mandatory interoperability points and optional advanced functions;
- native support for centralized, distributed, and AI-assisted intelligence.

This approach enables:

- predictable system behavior;
- scalable fan networks;
- simplified commissioning and maintenance;
- future-proof integration of intelligent functions.

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5. Relationship to existing standards

The proposed FLAS standard is intended to complement, not replace, existing IEC standards, including but not limited to:

- IEC 61131 and IEC 61499 (control architectures);
- IEC standards on LVDC systems and microgrids;
- IEC standards on building automation and energy management.

FLAS provides a **missing system-level layer** between electrical infrastructure standards and device-level ventilation products.

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6. Target users and stakeholders

The proposed standard is relevant to:

- fan and ventilation system manufacturers;
- building automation and HVAC integrators;
- LVDC and microgrid solution providers;
- industrial facility designers;
- regulatory bodies and policy makers;
- research institutions and standardization organizations.

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7. Standard maturity and readiness

A complete **pre-standard specification** has already been developed and is available as an open, royalty-free document.

The specification:

- is structured in IEC style;
- includes scope, terminology, architecture, behavior, communication fundamentals, and conformance;
- is suitable to be used as an initial Working Draft.

This maturity significantly reduces the risk and effort required to initiate standardization work.

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8. Proposed IEC work structure

It is proposed to develop the standard as a **single-part IEC document**, with the possibility of future extensions, such as:

- protocol-specific profiles;
- application-specific guidelines;

- conformity assessment specifications.

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9. Expected benefits of standardization

The proposed standard is expected to deliver:

- improved interoperability and system integration;
- reduced installation and commissioning complexity;
- accelerated adoption of LVDC-based ventilation systems;
- support for energy efficiency and decarbonization goals;
- a foundation for intelligent and AI-driven ventilation systems.

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10. Conclusion

The FLAS standard addresses a clear and growing need for **system-level standardization of intelligent ventilation networks**.

By defining open, technology-neutral, and behavior-oriented requirements, the proposed work item supports both industrial innovation and regulatory objectives, making it a strong candidate for IEC standardization.