

Application Extensions IW Session

SE and Asset Management Position Paper

Find us on www.incose.org/fuse
Or write us at fuse@incose.net

Setting the Stage

Goal of this session



In Q1 2024 there will be a position paper published on SE & AM.

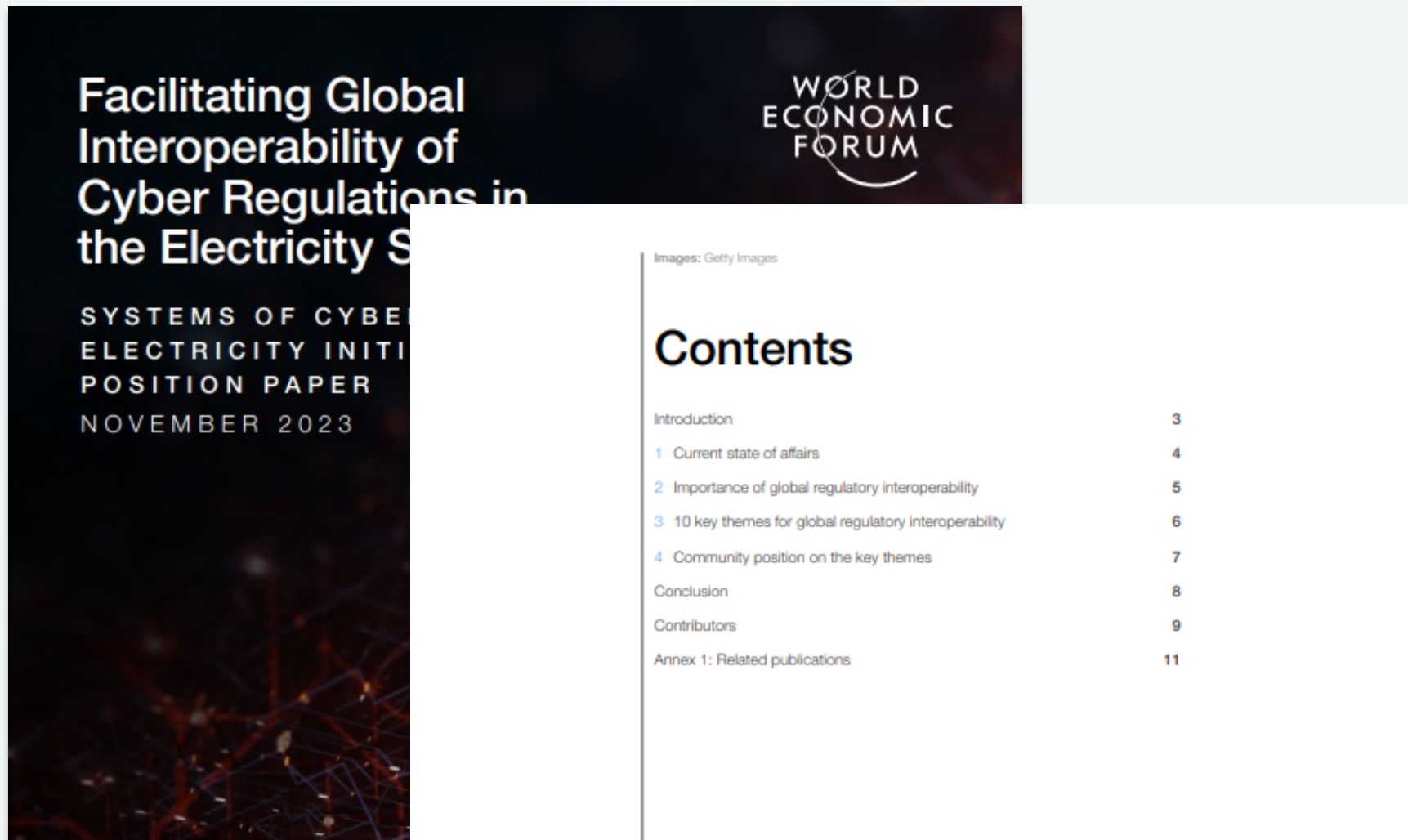
The position paper will utilize community insights generated in past sessions.

We need you to further shape the position presented in the paper.

Encourage you to engage to review the position paper.



Example of Position Paper



Content

- I. Introduction to FuSE Application Extensions Stream (5')
- II. Introduction to Systems Engineering & Asset Management (10')
- III. Review of Existing Results (5')
- IV. Workshopping Key Questions for Position Paper (30')
 - I. Why is SE and AM important?
 - II. What are they most important aspects to consider?
 - III. What is your position on those important aspects?
- V. Closing and Involvement (10')



Introduction to FuSE

Application Extensions Stream

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The core idea of the SE Application Extensions stream is the expansion into new domains. This stream not only integrates social sciences and soft systems but also extends the application of Systems Engineering to domains where it brings value but is not practiced today. This includes areas such as asset management, innovation, climate change, and more.

While engaging existing INCOSE Working Groups such as Smart Cities and Asset Managements is part of the stream mission, the focus is also on addressing grand challenges to meet human and societal needs, as stated in the United Nations Sustainable Development Goals.

The short-term goal is to frame the value model that justifies the role of Systems Engineering at the policy table for these grand challenges, thereby supporting the extension of its application beyond traditionally socio-technical aspects. This approach allows us to explore what we do today and also look beyond to the future possibilities.



Introducing the Future of Systems Engineering

FuSE is an initiative to inspire the global community to realize the Systems Engineering Vision 2035

FuSE

Engage and inspire the Systems Engineering community by realizing the SE Vision 2035 to sustain the Future of System Engineering.

The initiative for realizing the vision is structured into four streams:

- Vision & Roadmaps
- Foundations
- Methodologies
- Application Extensions

Vision & Roadmaps

Continuously refines, evolves, and complements the Systems Engineering Vision 2035

1

Foundations

Deploys the scientific method to discover the foundational principles elevating SE into a rigorous engineering discipline

2

Methodologies

Guides the advancement of practices, methods, and tools for engineering systems to be fit for purpose

3

Application Extensions

Demonstrates the value of Systems Engineering to meet socio-technical needs and promotes its use in a broad set of applications

4

Introduction to Systems Engineering & Asset Management



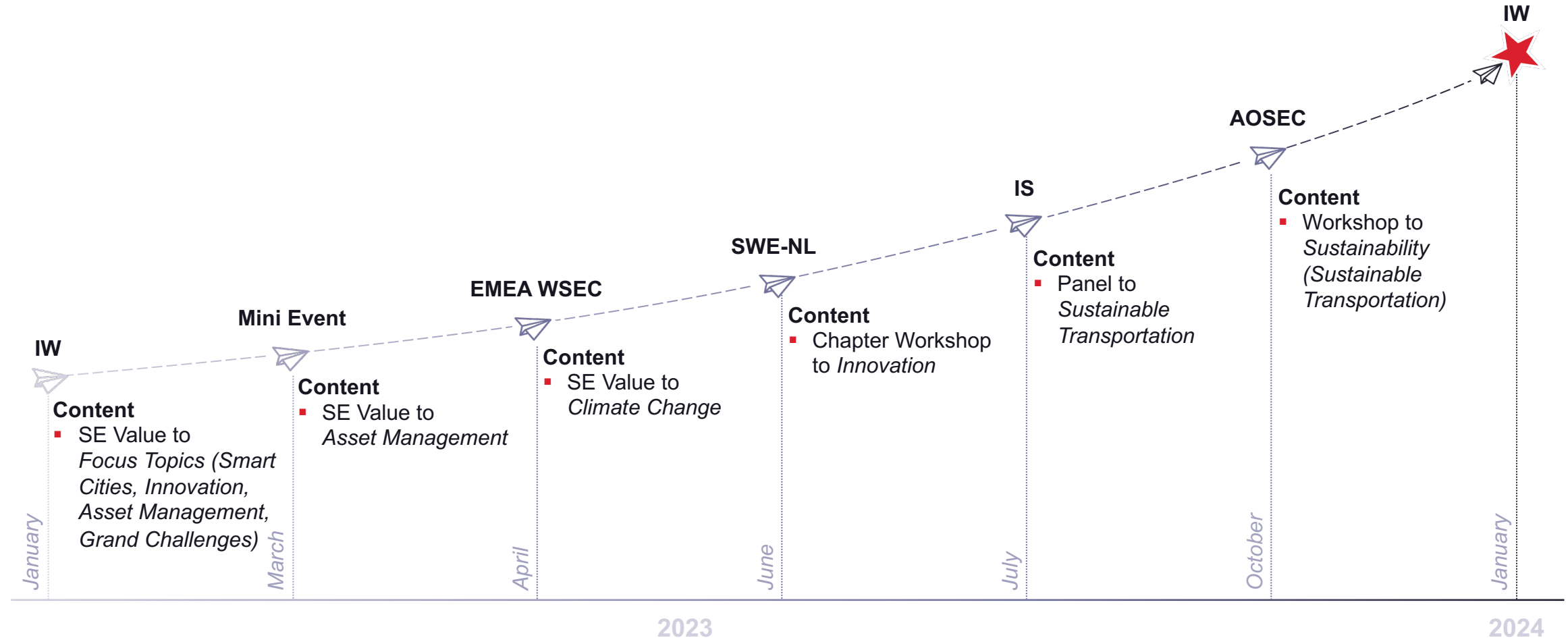
Review of Existing Results

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The conclusion for the way forward of the FuSE Application Extensions Stream and the results presented in this report are based on information we gathered from different events. In the next sections, we'll give you a brief overview of these events. We'll go into more detail about event demographics at the end of the report.

What results do we show and where do they come from?

An overview of the individual events and their results in a glance.



C | Asset Management

What was said about the correlations between Asset Management and SE?

- 1. Create a Holistic View and Foster Systems Thinking:** *The values that Systems Engineering brings to Asset Management include fostering a holistic view and systems thinking, encouraging a broader perspective, and emphasizing a holistic and systemic approach by considering assets as interconnected systems within a larger context.*
- 2. Understand, Identify and Create Value:** *The values that Systems Engineering brings include the ability to understand, identify, and create value. This involves generating interest and recognizing the value of assets, ultimately achieving a "Line of Sight" through organizational processes facilitated by SE, allowing individuals to understand their value within the organization.*
- 3. Consider the whole life-cycle:** *Considering the entire life cycle, Systems Engineering emphasizes forward-thinking and addresses long-term aspects in Asset Management. This approach helps counter "Accountability Fade" in significant infrastructure programs, supporting activities throughout the life cycle, from concept development to retirement and potential reuse.*
- 4. Provide State of the Art Methodologies:** *Systems Engineering provides state-of-the-art methodologies for Asset Management, delineating the "what" (AM) and "how" (SE) aspects. SE promotes standardization and shares methods for analyzing systems/assets to achieve missions in a cost-effective, long-term manner. Additionally, SE contributes to predicting failures of assets or systems, enhancing proactive maintenance strategies.*
- 5. Visualize and Model the System:** *Visualize and model the system by establishing digital thread requirements encompassing engineering, configuration management, sustainment, finance, and procurement, ensuring traceability from needs to implementation.*

What values can SE add to this topic?



● High influence

● Low influence

C | Asset Management

What was said about the correlations between Asset Management and SE?

What values can SE add to this topic?

6. **Provide a Structured Approach and Support Decisions:** *Systems Engineering offers a structured, holistic, and systematic approach, integrating scientific principles to support decision-making within the context of Asset Management.*
7. **Provide an Unbiased View and Integrate Stakeholder:** *Systems Engineering provides an unbiased view and facilitates stakeholder integration. To enhance synergy, it supports to harmonize SE and Asset Management processes and standards, emphasizing alignment for a cohesive approach.*
8. **Strengthen Interdisciplinary Collaboration:** *To strengthen interdisciplinary collaboration, the focus is on transdisciplinarity, ensuring the seamless integration of both technical and financial aspects within the collaborative framework.*
9. **Increase Efficiency:** This cluster seems to be less represented in the discussion.
10. **Support Communication and Provide a Common Language:** This cluster seems to be less represented in the discussion.
11. **Enable Knowledge Sharing:** This cluster seems to be less represented in the discussion.



● High influence

● Low influence

C | Asset Management

What was said about the correlations between Asset Management and SE in terms of target groups to approach and actions to be taken?

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Approaching IAM & 150, asset owners, and public infrastructure operators for Asset Management (AM), highlight how Systems Engineering (SE) adds value, tailor messages to their interests, and stress the importance of seeking alignment for mutual benefit.

As next steps several actions have been suggested within the joint discussions:

- I. Establish Memorandum of Understanding (MoU) between INCOSE and each Asset Management Group to formalize collaboration.
- II. Elaborate on the synergies between SE and AM, emphasizing their mutual benefits and collaborative potential using the working groups. This involves establishing nomenclature, providing use cases, and sharing best practices.
- III. Make use of the monthly meetings within INCOSE to align with the following working groups, Infrastructure WG, Transportation WG, Critical Infrastructure Protection and Recovery WG, and Smart Cities Initiative.
- IV. Implement a task force to organize resources and define products, ensuring effective collaboration and outreach between Systems Engineering and Asset Management working groups.
- V. Encourage integration across organizational barriers, both technical and non-technical, fostering a holistic approach to SE and AM collaboration.



Workshopping Key Questions for Position Paper



1. Why is the collaboration important?
2. What would you like see from this collaboration?
3. How would you go about this?



Closing and Involvement



The position paper will be produced in the first quarter of 2024

Who wants to get involved - in particular to review the paper?



VII. The Team.

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