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MEETING DOCUMENT

From:	General Secretariat of the Council
To:	Working Party on Energy
Subject:	Strategic Roadmap for digitalisation and AI in energy - presentation

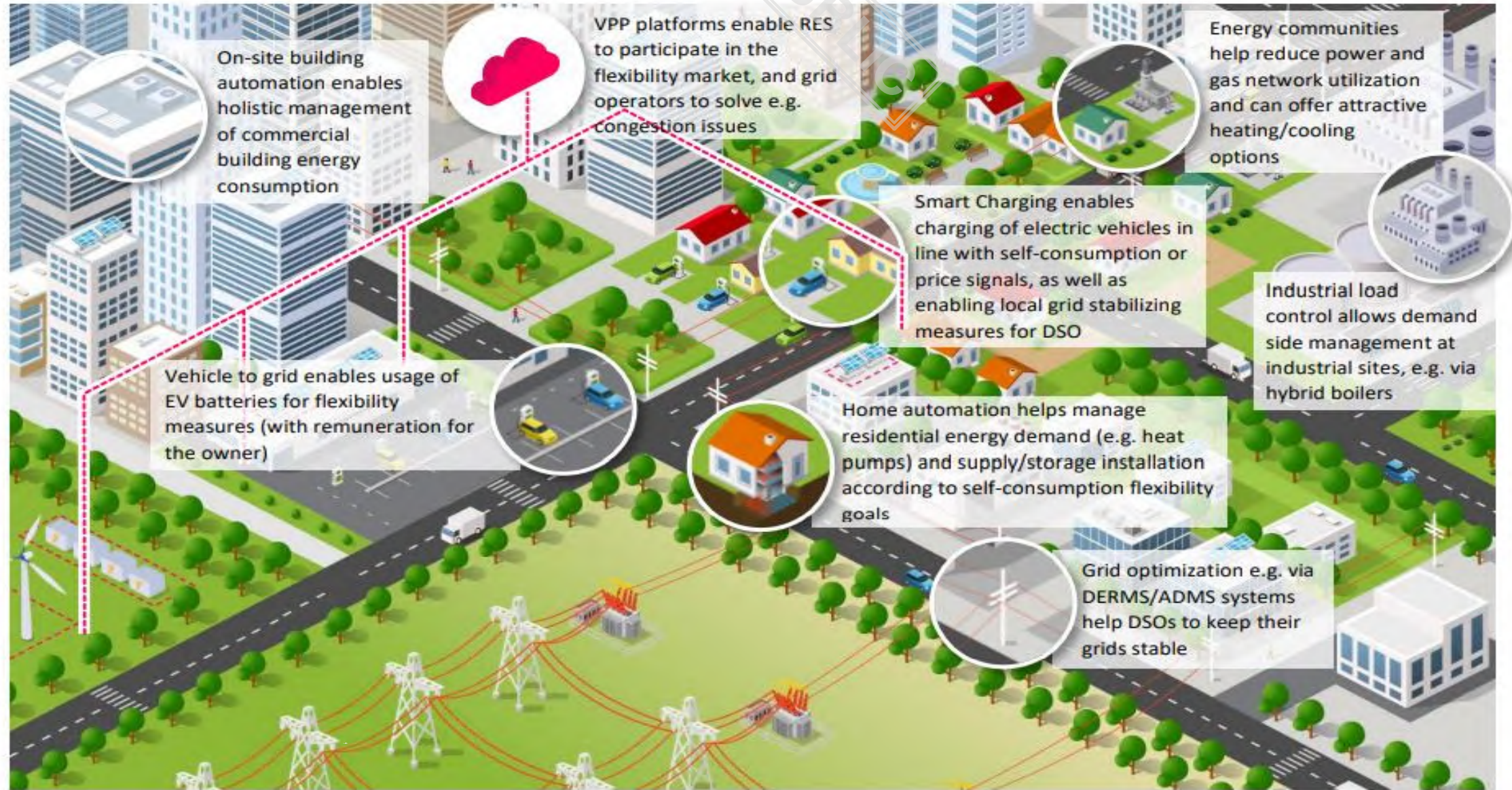
Delegations will find in the annex the presentation on the Strategic Roadmap for digitalisation and AI in energy.



Strategic Roadmap for digitalisation and AI in energy

December 2, 2025, ENER.B4

Unlocking the potential of digitalisation in the energy sector



Scope & Objectives

Scope: Leverage the potential of digital and AI technologies for the energy system, while mitigating the associated risks, with the goal of making the EU energy system fully digitalised and AI-enabled by 2035.

Objectives

1. powering AI - consumption of data centres will multiply until 2030;
2. making best use possible AI and digitalisation for energy system efficiency; and
3. making sure data centres are as energy efficient as possible.

Planned adoption: March 2026

Overview: 3 pillars

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Pillar I: Energy for AI

- Integrating sustainably data centres into the energy system
- Data centres EE Package

Pillar II: Digitalisation & AI for energy

- Support investment in a smart energy system
- Deploy AI across the energy value chain

Pillar III: Data for AI

- Common European energy data space
- Develop AI models for the energy system

Horizontal enablers

- Safety, security and trust in digital and AI solutions
- AI for cybersecurity and supply chain security
- Skills and capabilities
- International cooperation

Public consultation - an overview

- Duration: 3 months
- Participation: 325 responses: 145 to the CfE + 180 to the public consultation questionnaire
- Good balance between energy & digital stakeholders

Main issues:

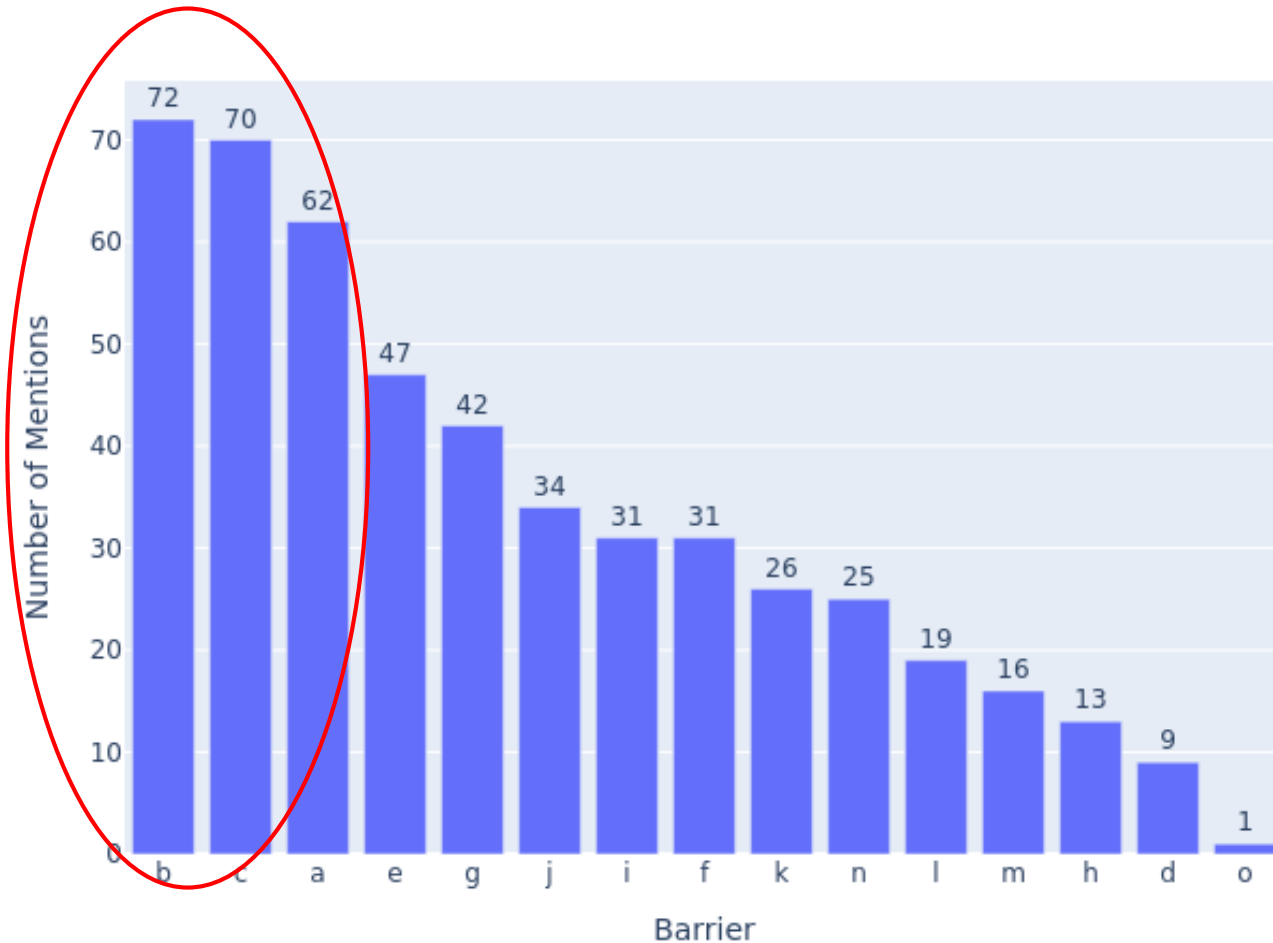
- Access to data - bottleneck for innovation and a European market for smart energy services
- AI models - transformative potential but efforts are slow, fragmented and unbalanced
- Data centres – a structured dialogue urgently needed for their sustainable integration
- Trust & risk oversight – develop trusts frameworks and monitor risks for critical infrastructures
- Regulatory certainty – rules are there, need for simplification, harmonisation, guidance
- Coordination and governance – a governance framework to address imbalances in Europe

Public consultation – data sharing

Call for a trusted data sharing framework

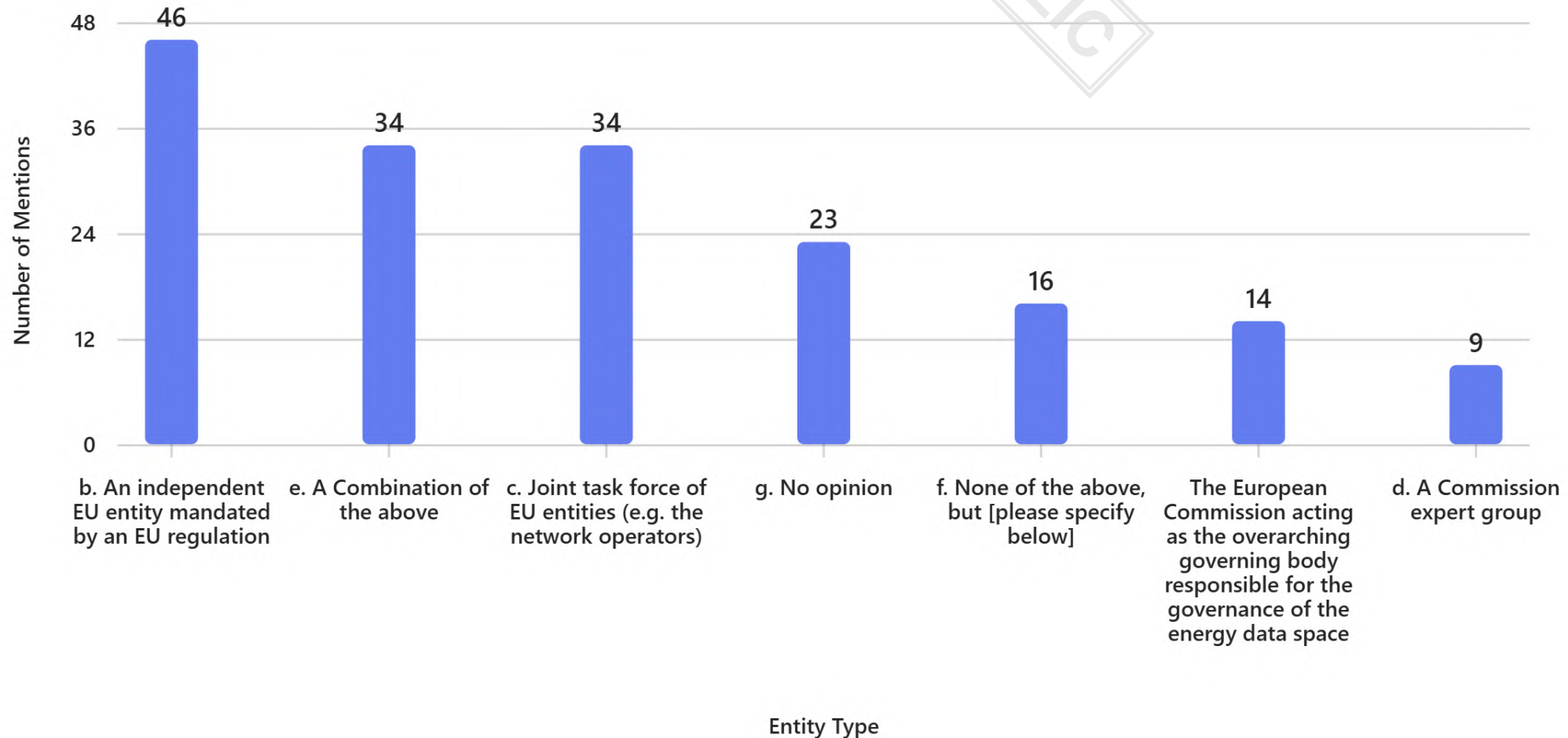
- *“Data must be accessed in a trusted and interoperable manner across Europe to allow for seamless cooperation and near-real-time data exchange, enabled by a Common European Energy Data Space”*
- *“Digitalisation and data interoperability should rest on appropriate standards, with a clear and trusted governance with a dual structure, comprising an independent EU body to provide legal certainty and avoid national fragmentation, and a multi-stakeholder governance council“*
- *“need for harmonisation of national regulations and the establishment of formal EU-level governance structures”*
- *“the most adequate oversight entity would be a combination of an independent EU entity mandated by an EU regulation and a joint task force of EU entities (e.g. network operators)“*

Main barriers to deploy digital and AI technologies in the energy sector



- b. Limited access to high-quality data
- c. Cybersecurity and data privacy concerns
- a. Lack of data interoperability and standards
- e. Regulatory and policy gaps
- g. Low digital maturity of legacy systems;
- j. Unclear business models and uncertain returns on investment
- i. Fragmented governance and coordination
- f. Skills and workforce shortages
- k. Social perception issues and mistrust of digital and AI tech
- l. Resistance to organisational change
- m. Fear of vendor lock-in
- h. Lack of demonstration projects and use cases
- d. High upfront investment costs

Type of entity to oversee the governance of the common European energy data space

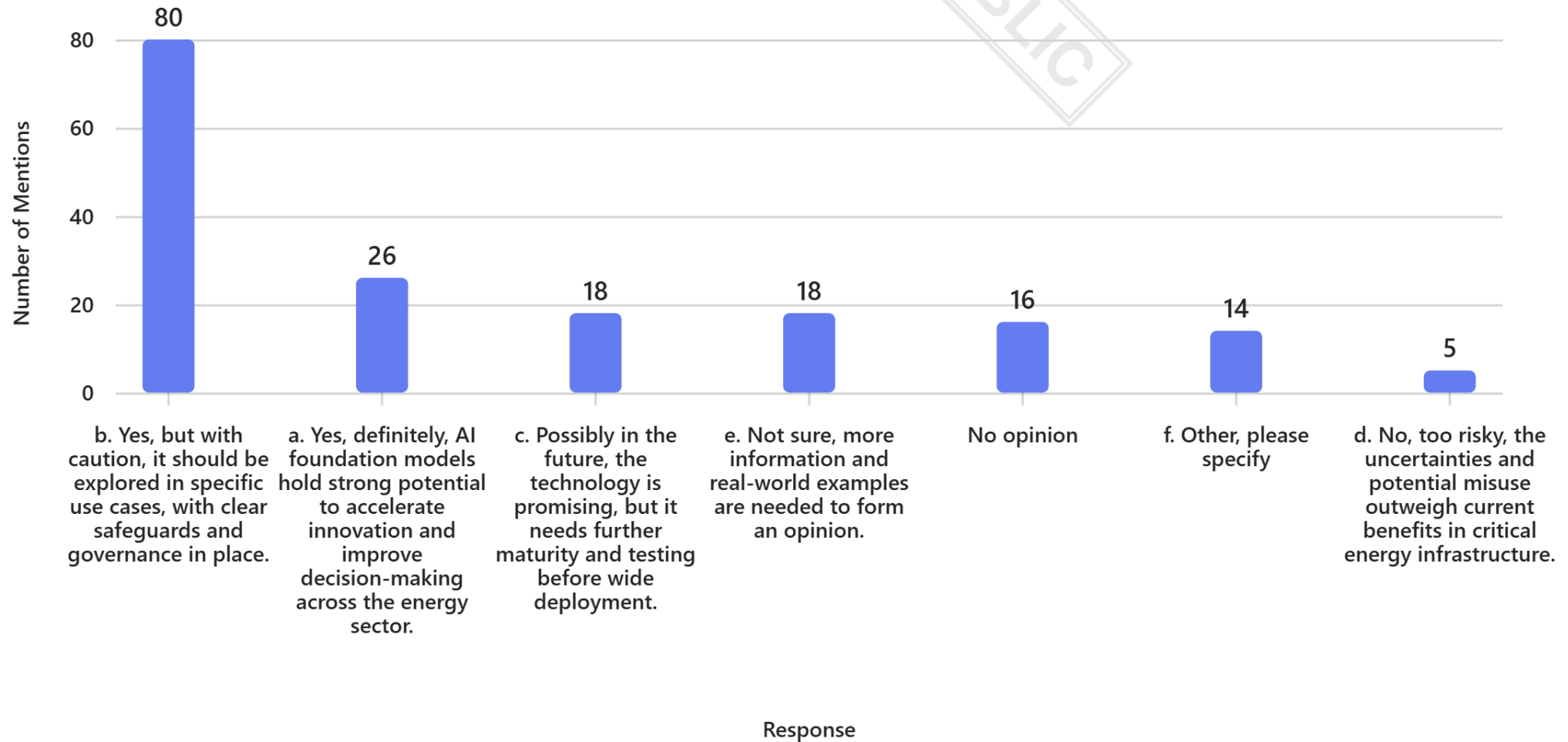


Public consultation – AI models

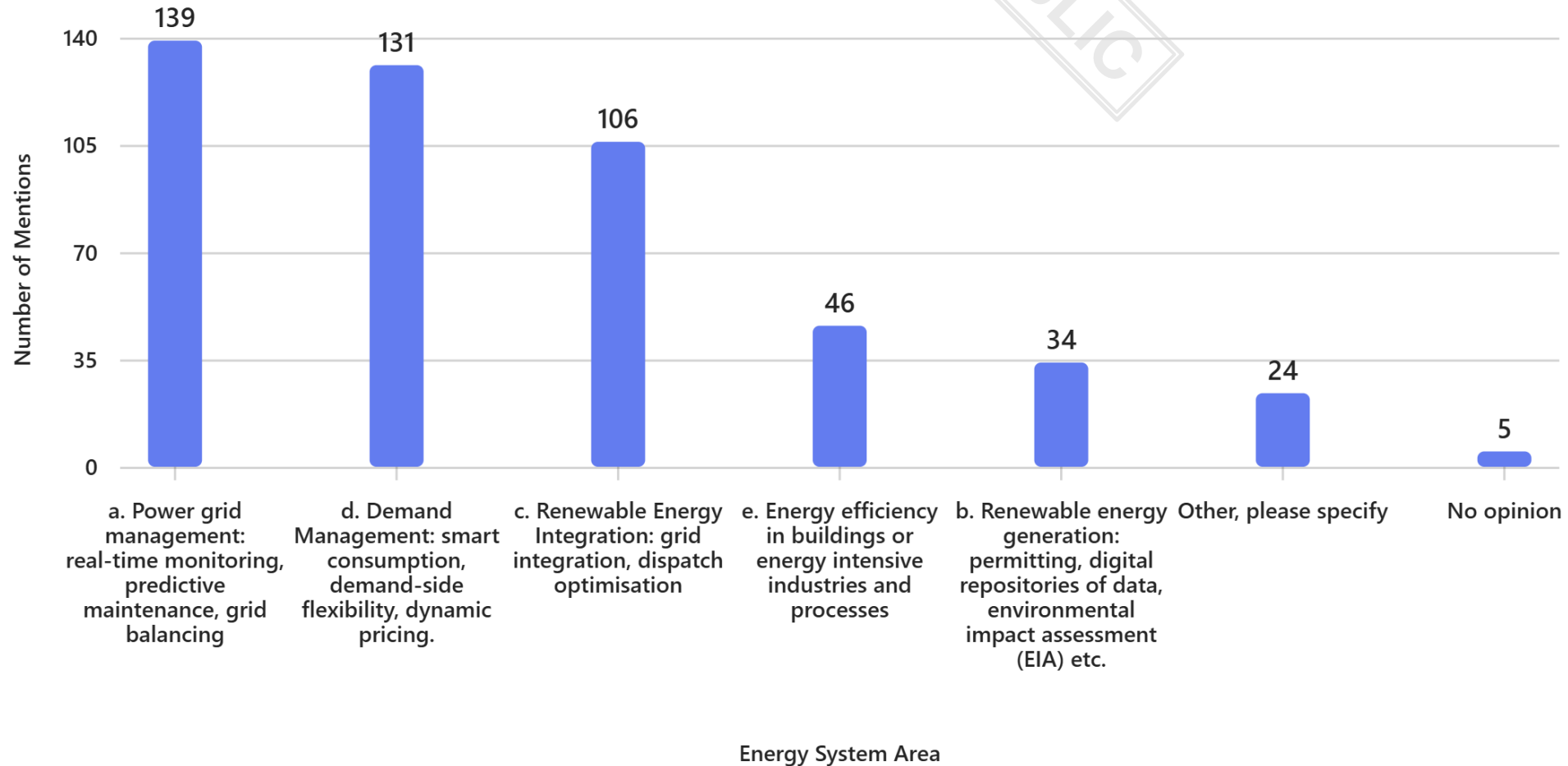
Call for an EU-wide initiative to support the development and deployment of AI models

- *“AI Foundation models for grids (GridFM) can revolutionise how we manage energy, making grids smarter, more resilient, and better prepared for the future.”*
- *“Europe lost the LLM battle, now risks becoming permanently dependent on AI models that operate our critical energy infrastructure, putting EU’s putting EU’s sovereignty at risk”*
- *“European AI models should be trained in European infrastructure, trained by energy companies with their own operational data without disclosing sensitive data to foreign powers”*
- *“EU-wide collaborative efforts are needed to train, test, validate and safely deploy AI models in energy”*
- *“We advocate for building a “Pan-European Foundation Model for the Energy System“, a family of models trained on EU-relevant data and governed as a public good”*

Do you think there's a case for deploying AI foundation models?



Areas of the energy system which would benefit most from the deployment of digital and AI technologies



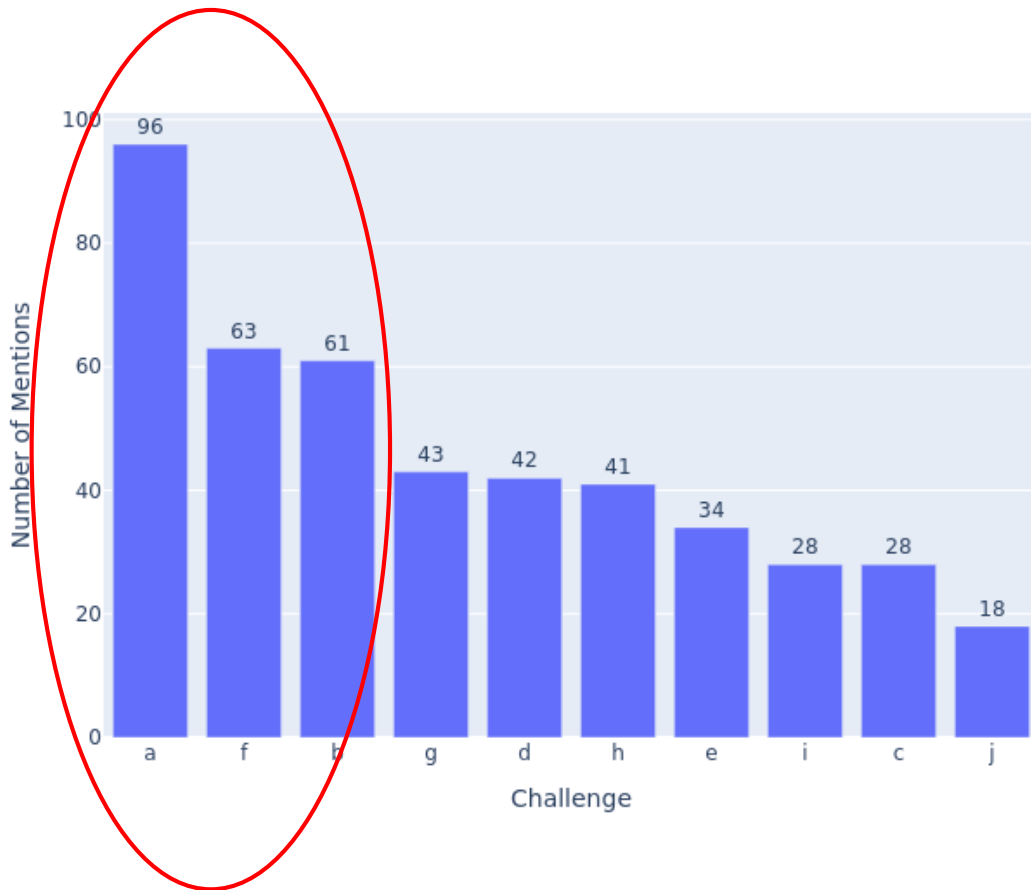
Public consultation – data centres

Call for a structured dialogue and commitments from energy and data centre industries to improve grid planning and connections, so that data centres can become assets for the grid

- *“Data centres are critical to Europe's competitiveness and digital sovereignty, at the same time they are large grid users, posing significant challenges to Europe's energy system”*
- *“If not proactively managed, the anticipated additional electricity demand risks undermining the security of energy supply, increasing grid congestion and pushing up electricity prices”*
- *“a structured EU dialogue among public authorities, energy and digital actors is urgently needed to agree common principles for the sustainable integration of data centres into the energy system*
- *“The Roadmap should explicitly coordinate long-term planning integrating data centre expansion into national and regional grid development plans“*

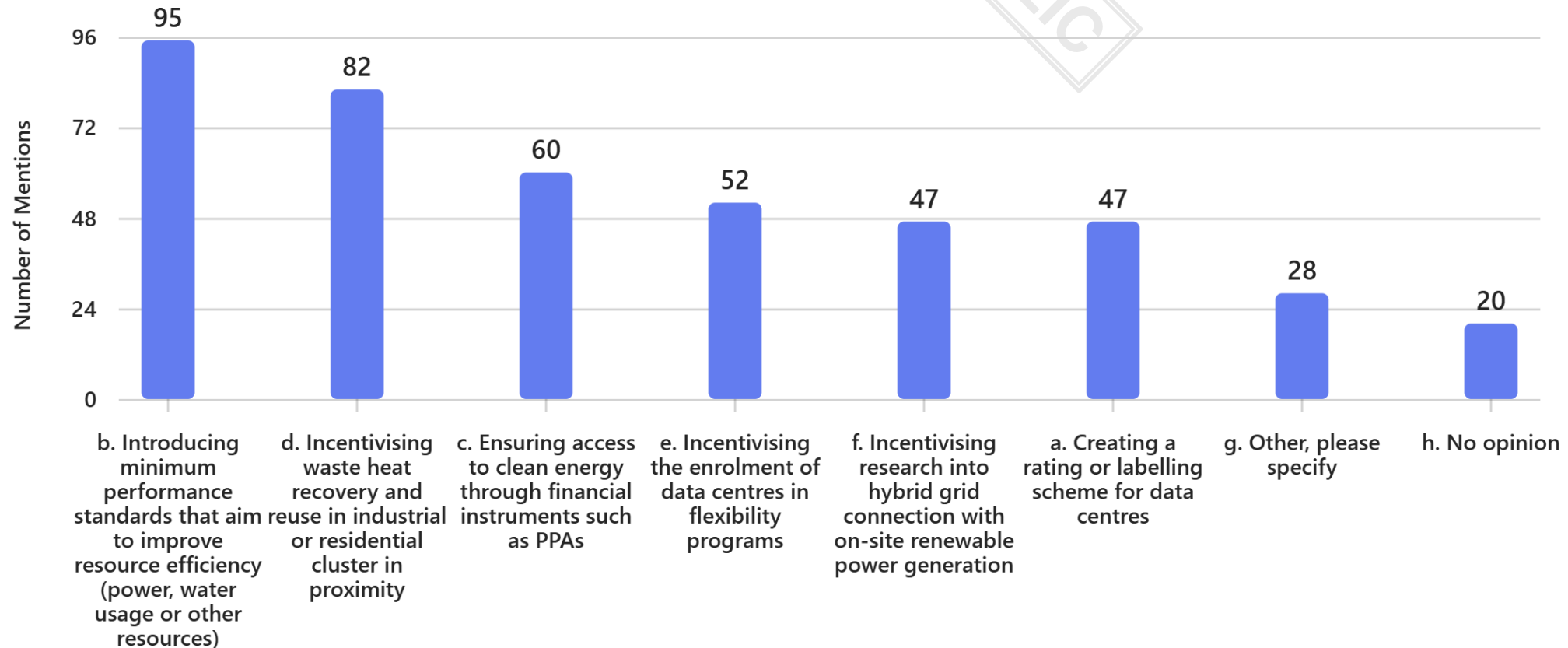
What are the major challenges that arise from the rapid expansion of data centres?

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- a. **Grid congestion** in areas with data centre clusters;
- f. Meeting data centres' power needs with **clean energy sources**
- b. Complexity in **grid planning** caused by rapid development of data centres;
- g. Impact in energy affordability
- d. Delays in grid connection approvals caused by rising demand
- h. Environmental concerns: water use, land use and landscape preservation
- e. Risk of overloading substations resulting to costly upgrades
- c. Inflexible and firm demand profiles of data centres with little variability

What actions could support the shift to more sustainable and energy-efficient data centres?



Suggested Actions

Outreach activities (2025) - #1

- Common European Energy Dataspace: 4 physical workshops (100 experts each)
 - 2 in Brussels, 1 in Vienna & 1 in Berlin co-hosted by the Federal Ministry for Economic Affairs and Climate Action
 - Priority use cases: data exchange for **demand side flexibility** and **smart & bidirectional charging of EVs**
- Develop and deploy AI foundation models in the energy system
 - 4 online workshops: total 1000 experts from energy and digital industries
 - Priority use cases: **Grid foundation models, AI in renewables and buildings, AI risks in critical infrastructures**
- Sustainable integration of data centres in the energy system:
 - 3 workshops: 60 experts each from energy supply, grid & data centre industries
 - Priority areas of cooperation: **planning, access to energy, demand side flexibility, grid stability**

Outreach activities (2025) - #2

- 2 workshops with Member States
 - 23 Oct: Workshop with Member States on national energy data exchange platforms, organised under SEEG
 - 24 Oct: Workshop with Member States on system integration of data centres, co-organised with the DK presidency
- High-level event hosted by EVP Virkkunen & Commissioner Jørgensen with industry leaders from energy & digital



Thank you

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