

Panel: Data privacy centralization or decentralization: key challenges in Distributed Energy Resources (DERs)

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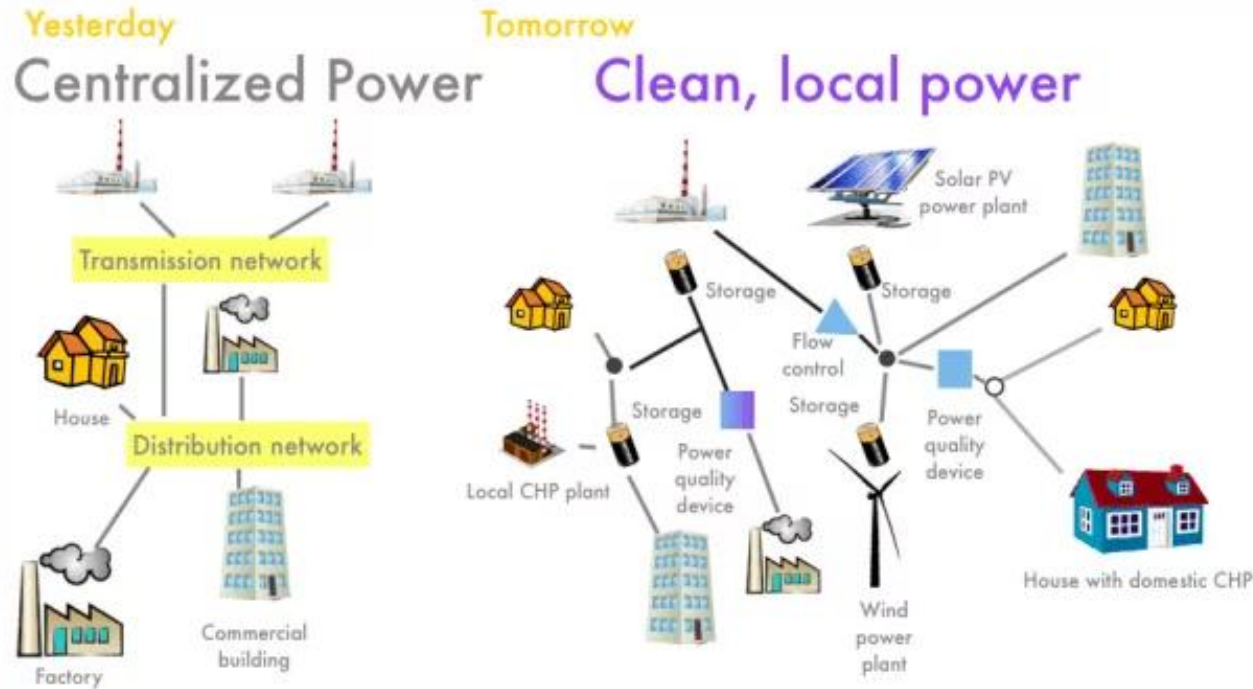


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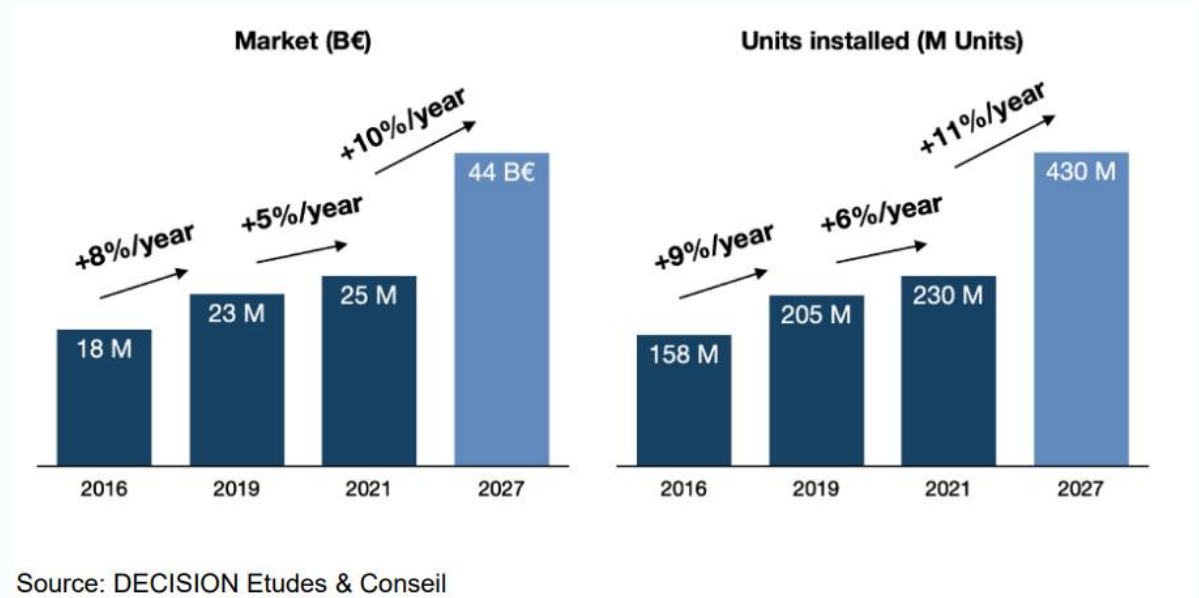
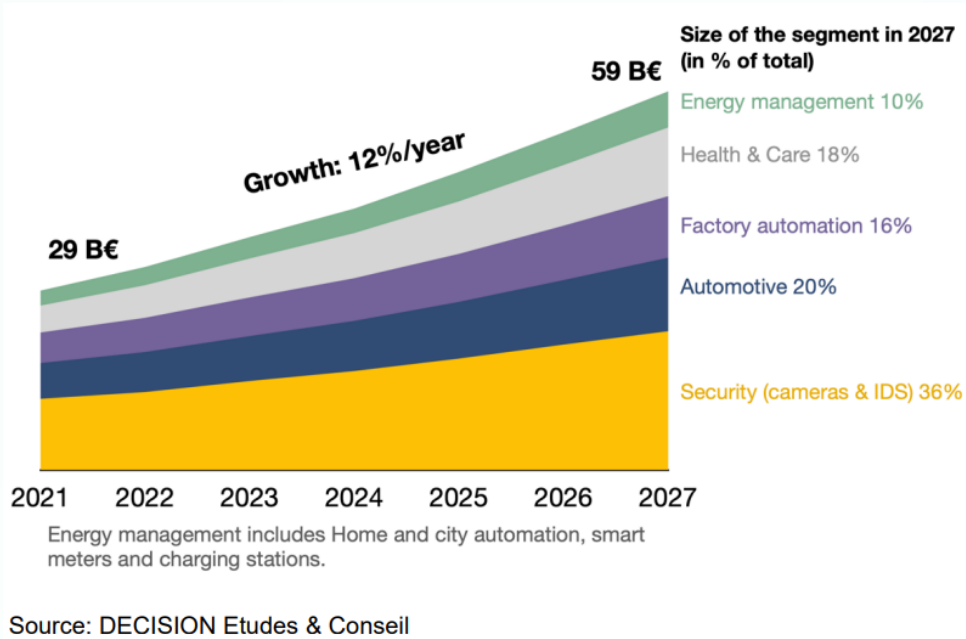
Disclosure - Denis Pombriant is the author of *The Age of Sustainability*.

- Distributed Energy Resources (DERs)
- Smart meters by DSOs
- Smart grid - crucial role for prosumers
- Data, AI, analytics for efficiency and flexibility
- New business models



... the outstanding opportunity

Workshop on Digital ID management and data governance through emerging IoT-edge computing and DLT solutions



Green Energy Transition is a top EU priority

AI processed at the edge
- DERs is key

Scalability and distribution in the continuum signalled in DECISION





Data

Surveys signal that **harmonization** of data flows, communication networks and cybersecurity are crucial.



Openness

Energy applications tend to work in siloes. Flourishing in the diversity and **reusing open solutions** is in contest.



Success

A lack of **cooperative success stories** is preventing the potential of edge computing in energy from unleashing.



- Data privacy centralization or decentralization: key challenges in Distributed Energy Resources (DERs)
 - **Balancing Privacy and Accessibility** – Centralized data storage in DERs simplifies access control but increases vulnerability to breaches, while decentralized systems enhance privacy but complicate data sharing and governance.
 - **Regulatory Compliance** – Different jurisdictions impose varying privacy laws (e.g., GDPR, CCPA), making it challenging to align centralized or decentralized data management strategies across global DER networks.
 - **Cybersecurity Risks** – Centralized DER data hubs present high-value targets for cyberattacks, while decentralized approaches, such as blockchain, require robust encryption and authentication to prevent unauthorized access.
 - **Scalability and Interoperability** – A centralized model may struggle with scalability as DER adoption grows, whereas decentralized solutions need seamless integration among diverse stakeholders, devices, and protocols.
 - **Trust and Data Ownership** – Centralization can concentrate control in a few entities, raising concerns over monopolization, whereas decentralization empowers users but requires mechanisms to ensure data integrity and prevent manipulation.



- What can CEI Ecosystem and O-CEI / CEI-SPHERE do for DERs and other ecosystems
 - **Local Data Processing & Anonymization** – Cloud Edge IoT enables real-time data processing at the edge, reducing the need to transmit sensitive DER data to centralized cloud servers, thus enhancing privacy and minimizing exposure to cyber threats.
 - **Decentralized Access Control** – By implementing distributed identity management and authentication at the edge, Cloud Edge IoT ensures that only authorized entities can access DER data, reducing risks associated with centralized data breaches.
 - **End-to-End Encryption & Secure Storage** – Cloud Edge IoT supports secure encryption protocols for data transmission and local storage, ensuring that DER data remains confidential even in a distributed environment.
 - **Regulatory Compliance & Data Sovereignty** – Edge computing allows DER data to be processed within specific geographic regions, helping organizations comply with privacy regulations (e.g., GDPR, CCPA) by keeping sensitive data within mandated boundaries.
 - **Resilience Against Cyber Threats** – By distributing data storage and computation across multiple edge nodes, Cloud Edge IoT minimizes single points of failure, reducing the impact of cyberattacks and unauthorized data access.



- Panelists and specific discussion points:
 - **Prof. Jens Strüker (Fraunhofer Blockchain Lab)** - The Need for a Digital Spine: How Web3-Technologies Unlock DER Flex Potential
 - Web3 technologies can securely coordinate DERs without relying on centralized intermediaries. By leveraging decentralized identity management and tokenization, Web3 enables automated, transparent, and trustless transactions, allowing DERs to efficiently participate in energy markets while ensuring data privacy and security
 - **Mr. José Cantera (IOTA)** – IOTA Tangle and digital Identity applied to digital product passports
 - By leveraging IOTA Tangle and digital identity, DERs can integrate Digital Product Passports (DPPs) to securely store and verify asset histories, maintenance records, and sustainability credentials, enabling trust in decentralized energy markets. Allowing DERs to exchange energy and data efficiently while digital identities ensure tamper-proof authentication, reducing fraud
 - **Mr. Jan Peters (PLE)**– The Role of Blockchain in Decentralized Energy Markets: Enabling Transparency and Efficiency
 - Blockchain enhances transparency in decentralized energy markets by providing an immutable ledger for secure transaction tracking. Smart contracts automate peer-to-peer energy trading, reducing intermediaries and improving market efficiency. Decentralized identity and secure data sharing empower energy prosumers while ensuring privacy and regulatory compliance.





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YOU

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