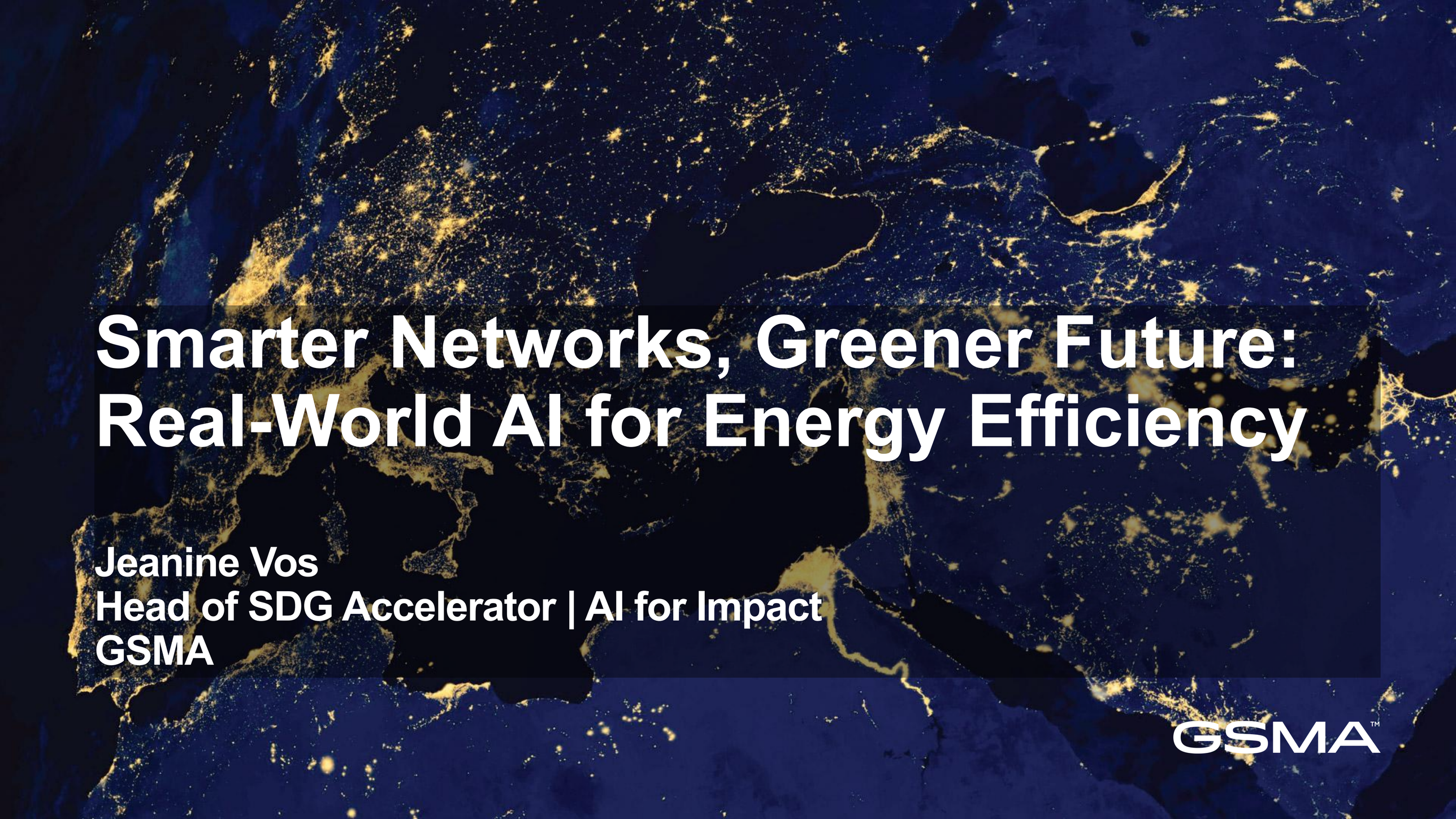

Smarter Networks, Greener Future: Real-World AI for Energy Efficiency

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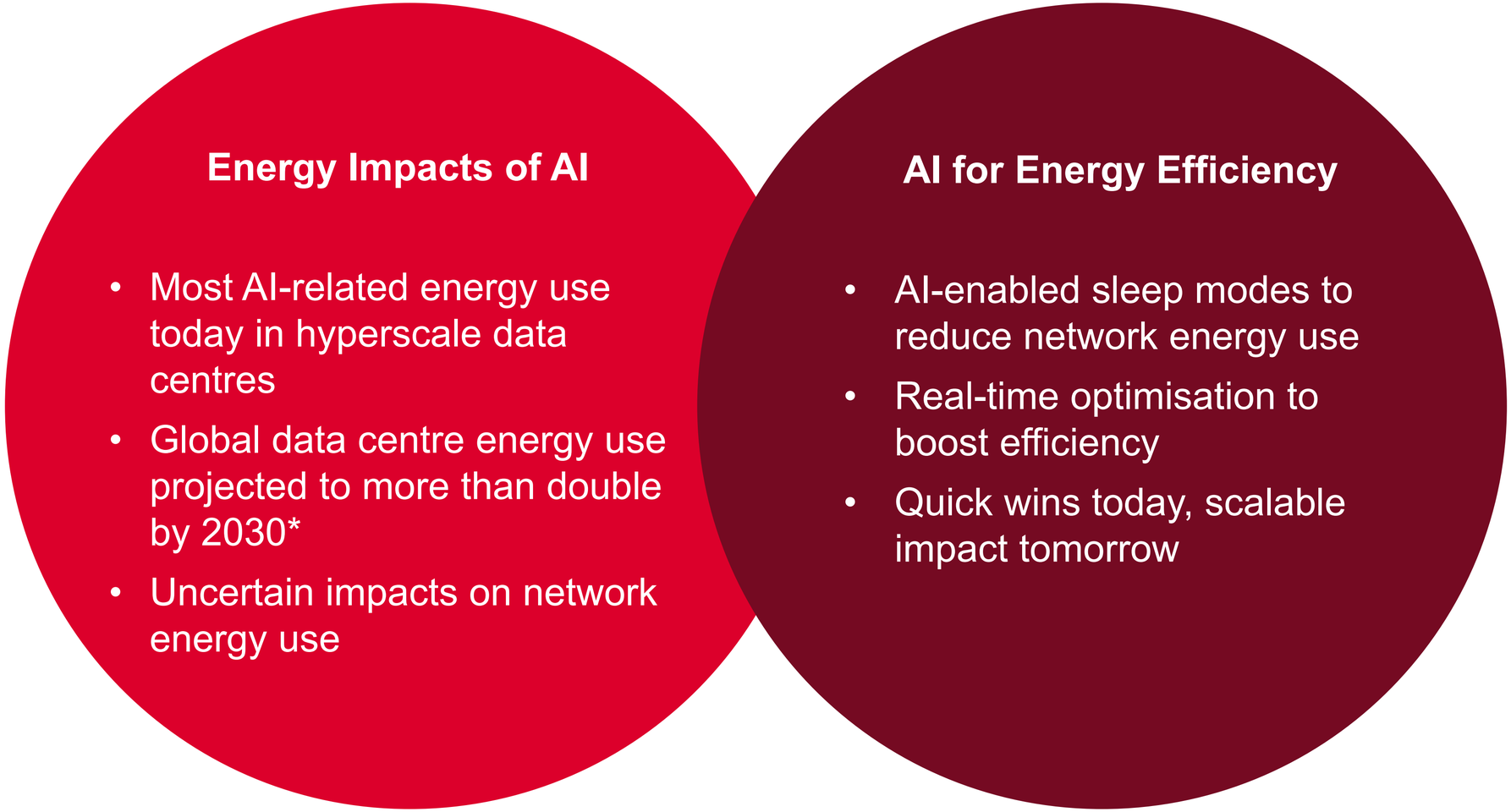
AI and Networks: A Two-Way Transformation

While AI makes telecom networks more intelligent and adaptive, those same networks are enabling AI to scale, evolve and reach further.

AI for Networks	Networks for AI
• Smarter traffic management • Automated energy optimisation • Predictive maintenance • Self-healing and fault resolution • Intelligent capacity planning	• 5G enables real-time AI at scale • Edge computing brings AI closer to users • Telecom data powers AI models and insights • Support secure and trusted AI deployment • Infrastructure attracts global AI investment

AI for Energy : Balancing Efficiency & Consumption

AI is driving energy demand growth in data centres, but there are significant opportunities for AI to boost energy efficiency of networks



*Source: IEA (2025), Energy and AI.

Case study: Telenor
Strategic AI planning for sustainable networks

Challenge

Reducing energy consumption in the RAN without compromising service quality, while aligning with long-term network sustainability goals.

Solution

Telenor has deployed AI-powered traffic forecasting to optimise energy use in the radio access network. The system dynamically powers down selected base station elements during predictable periods of low demand without affecting network performance. The solution is part of a broader strategy to embed sustainability into network design and operations.

Key results

Energy savings: **4% reduction** in consumption for tested networks.
Efficiency gains: extended energy-saving mode from four to seven hours daily.
Scalability: ready to expand across more network areas.

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Case study: Turkcell
Real-time AI control for immediate energy impact

Challenge

Minimising energy consumption in radio networks during low-traffic periods without compromising service reliability.

Solution

Turkcell has implemented real-time AI-based optimisation to manage radio network activity dynamically. During off-peak hours, the system automatically adjusts or powers down selected components to reduce energy use.

Key results

Energy savings: **Over 10% reduction** in energy use across targeted sites
Operational efficiency: Automated controls ensure seamless performance during optimisation
Immediate impact: Results achieved within weeks of deployment, with plans to extend further

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Lessons learned from real world deployment

Readiness
Operators are at different stages of AI maturity, affecting deployment speed and scope

Visibility
Energy data is often incomplete or siloed, making impact hard to measure

Quick wins
Targeted use cases, like mobile network optimisation, can deliver immediate savings

Scaling
Broader impact needs cross-functional buy-in, planning, and integration

Collaboration
Shared frameworks and industry dialogue help accelerate what works

Ecosystem
Governments can help through e.g. incentives for investment and sustainable AI

Turning insight into Industry Action

AI for energy efficiency is no longer a future promise, it's delivering results today

- The telecom sector is committed to balancing AI innovation with sustainability outcomes
- Energy performance must be part of every AI roadmap
- The GSMA is convening operators to build shared insight, align approaches, and accelerate best practice adoption

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