stockholm exergi

Reflections on efficency, resilience and responsibility in AI-driven energy systems and research data

Robert Nilsson, Head of Corporate Security



2026-09-28

Some reflections on

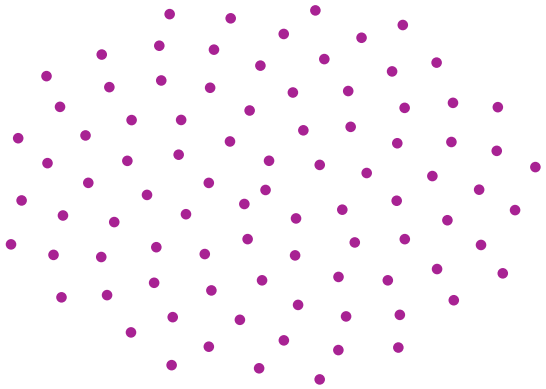
AI-driven Energy Systems

Research Data



stockholm exergi

AI-driven Energy Systems



stockholm exergi

What happens when AI becomes part of societal critical infrastructure?

stockholm exergi


POWER GRID
• Smart Transmission
• Real-time Monitoring
• Adaptive Balancing
• Predictive Optimization
• Output Forecasting
3
DISTRICT HEATING
• Efficient Heat Distribution
• Demand Responsive
• Low-Carbon Heating
6
DIGITAL DATA STREAMS
• Real-time Data Integration
• AI-Powered Optimization
• Secure & Resilient Network
EV CHARGING
• Smart Charging
• Vehicle-to-Grid
• Load Management
BATTERY STORAGE
• Energy Storage
• Peak Shaving
• Backup Power
SYSTEM OVERVIEW
POWER GRID
WIND
HEATING
EV CHARGING
BATTERY STORAGE
DATA FLOW
ENERGY DEMAND FORECAST
Today
Tomorrow
7 Days
ENERGY FLOW
SYSTEM EFFICIENCY
89%
GRID STABILITY
CARBON IMPACT
Today
128 tCO2
-34%
vs yesterday

The attack surface is shifting.

stockholm exergi

In between

1

Yesterday

- People made decisions
- SCADA provided support
- Experience
- Expertise

We used to protect:
Servers, networks, control systems

2

Tomorrow

- AI generates recommendations
- AI optimizes
- AI prioritizes
- AI can control
- Data
- Models

Now we must also protect:
training data, sensor data, models, supply chains

stockholm exergi

Importance & considerations

Issues of increasing importance

Who owns the model?

Where is the data located?

Who maintains the AI platform?

What strategic dependencies are we building in?

Considerations

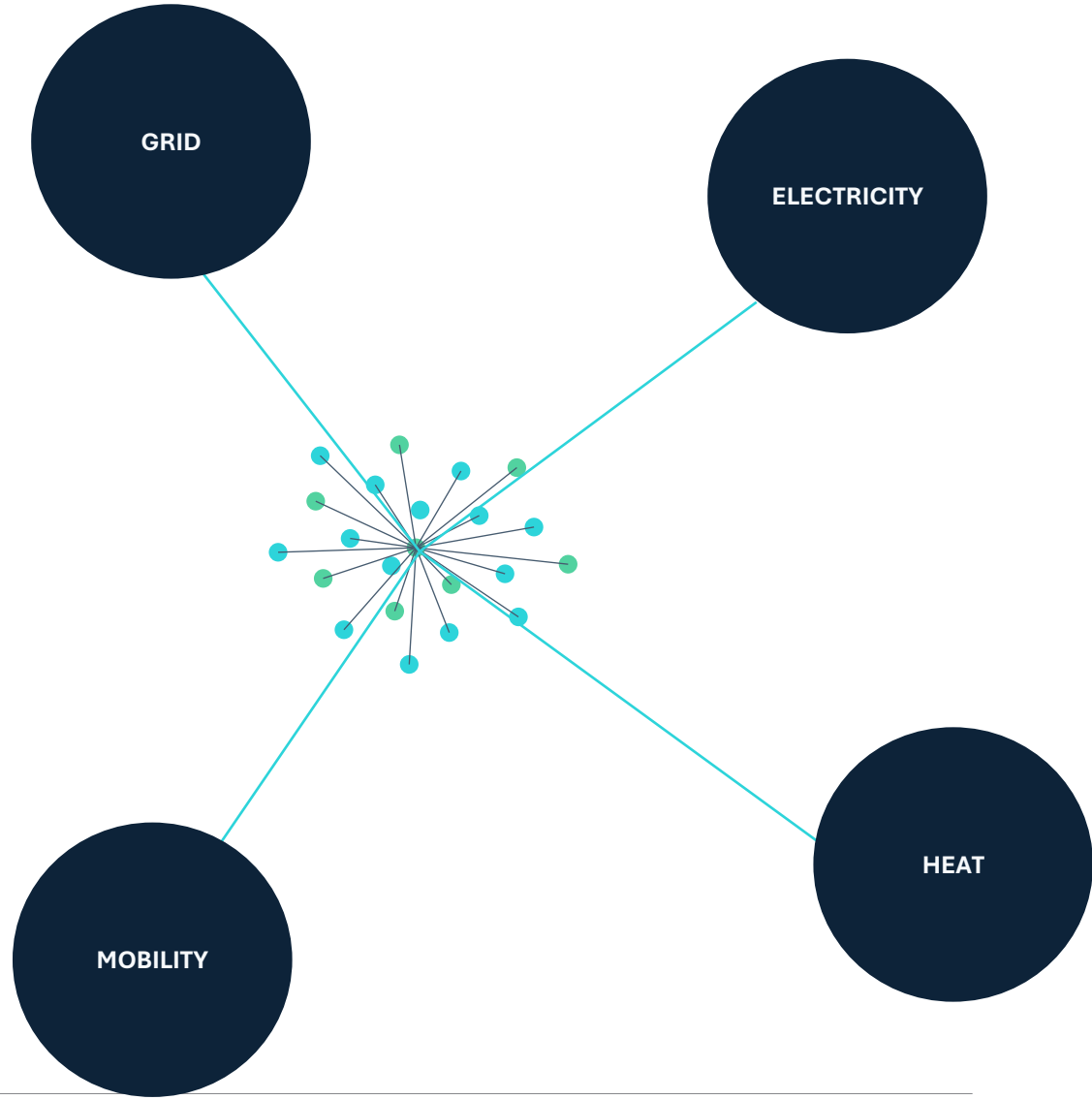
When energy systems become dependent on advanced AI components, technology choices also become security policy choices.

- Robustness over perfection
- Explainability over magic
- Human responsibility over autonomy



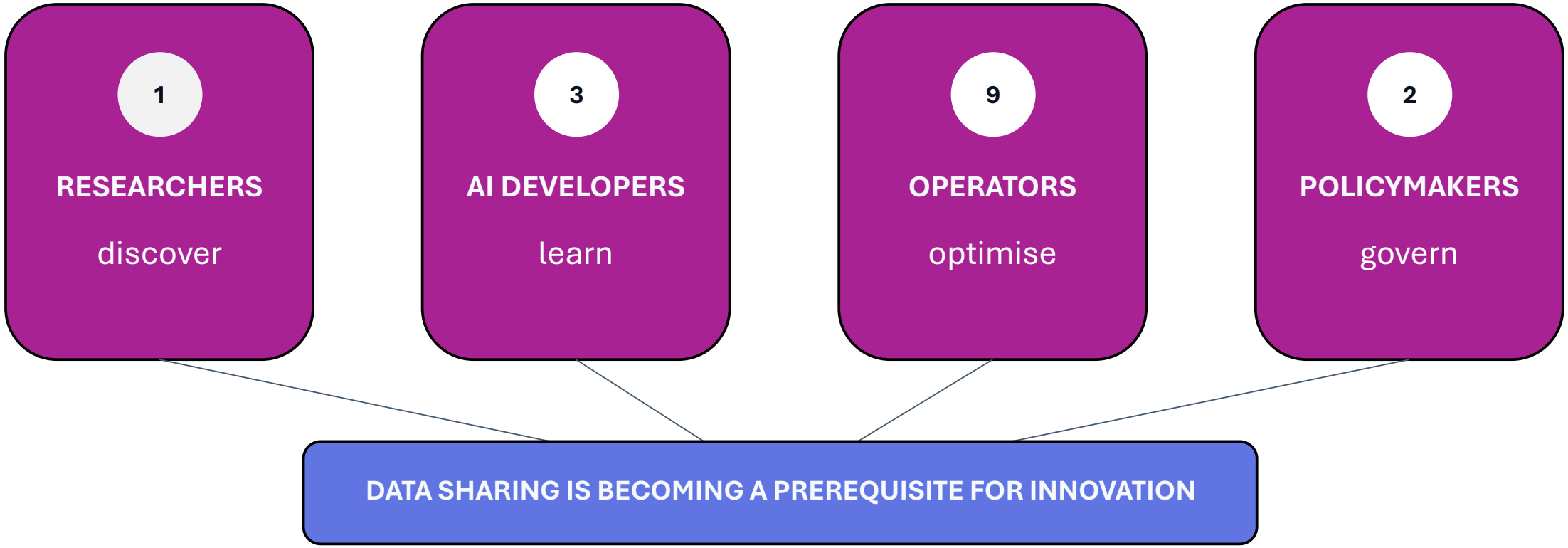
stockholm exergi

Research Data



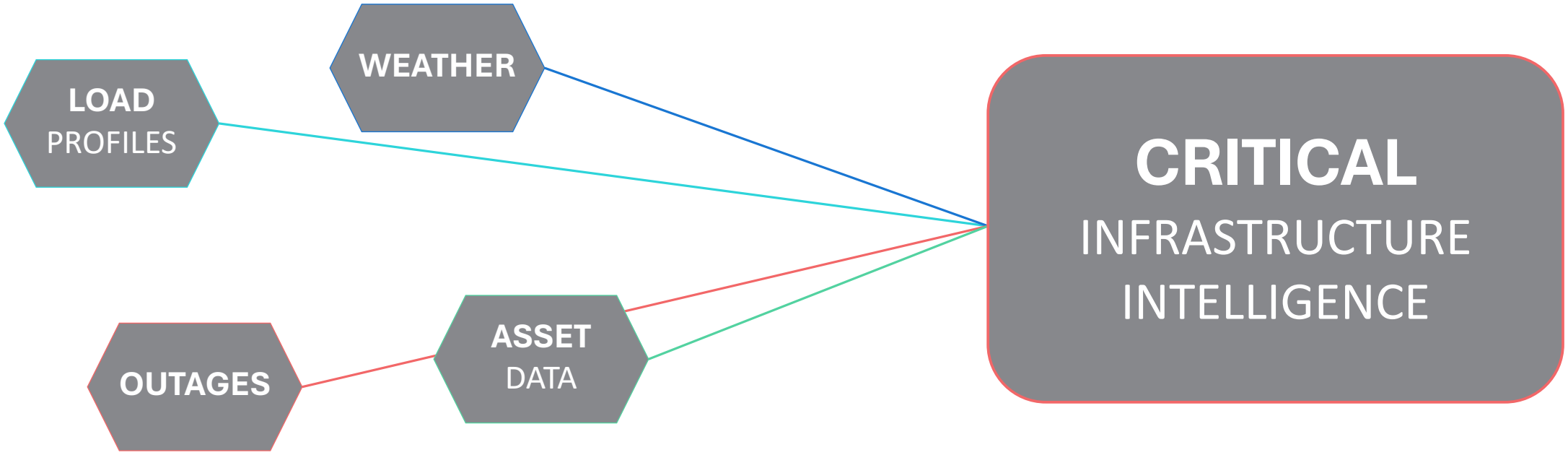
stockholm exergi

Everybody wants more data



The incentive is clear. The consequences are less visible.

Data rarely becomes sensitive on its own

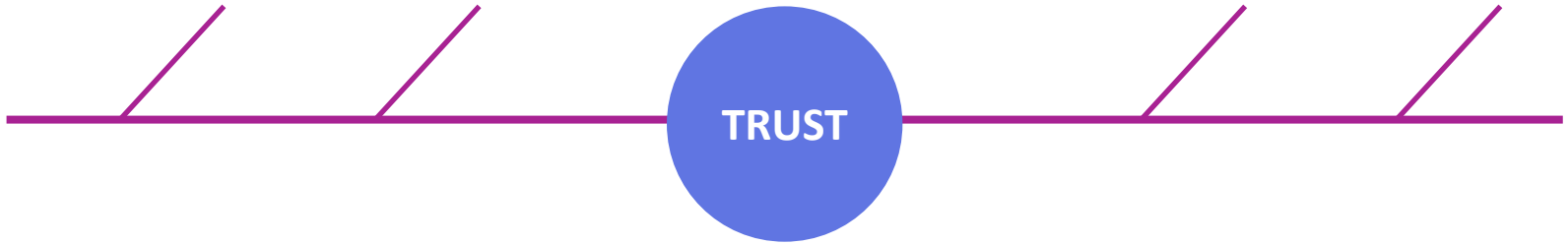


Same data. Different observer. Different consequence.

stockholm exergi

Security is not about saying no

RESEARCH **SECURITY**



Security enables innovation

by making the conditions explicit.

Innovation remains credible

when it understands consequences.

stockholm exergi

Three questions before sharing data

Knowledge

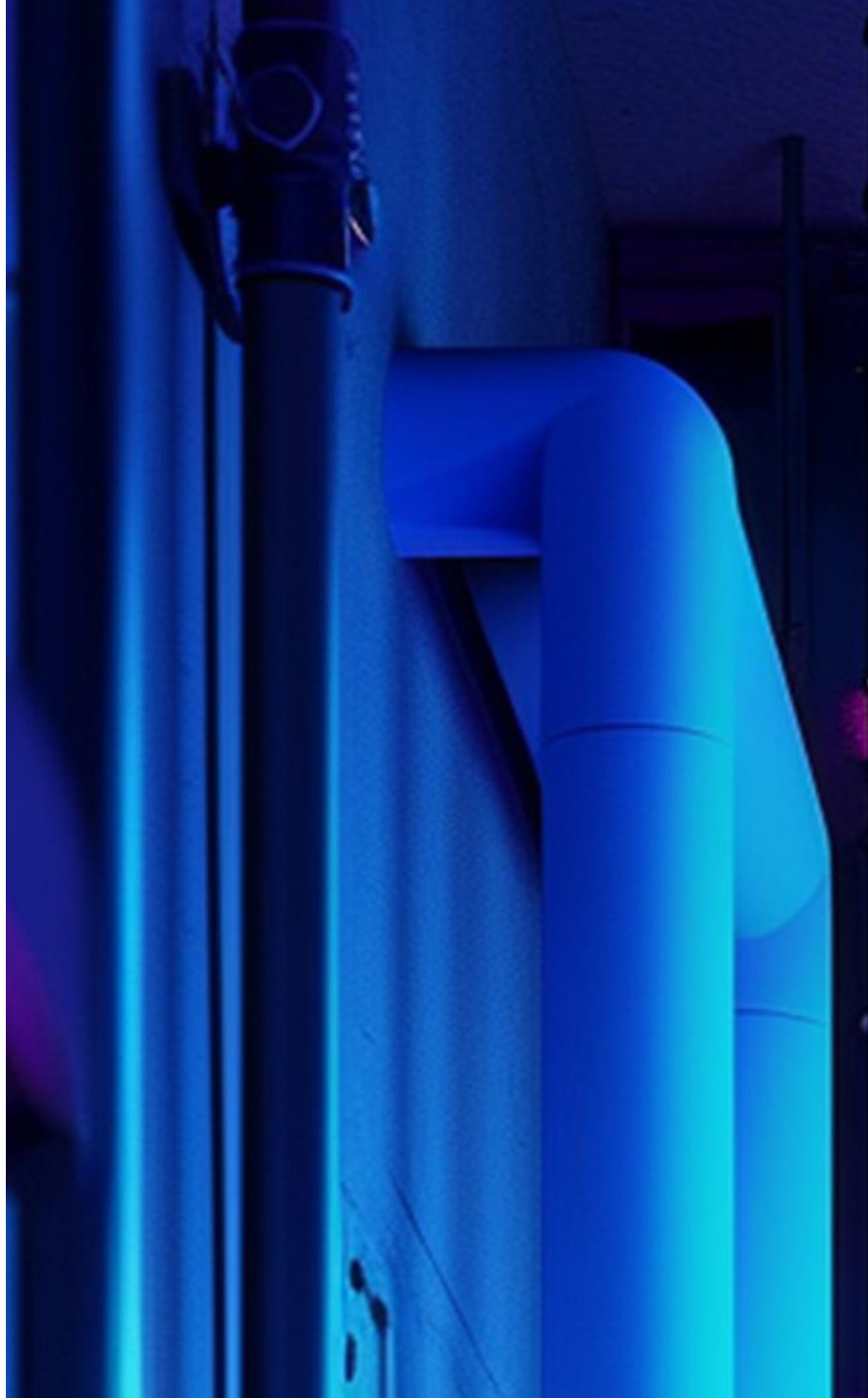
What new knowledge can emerge?

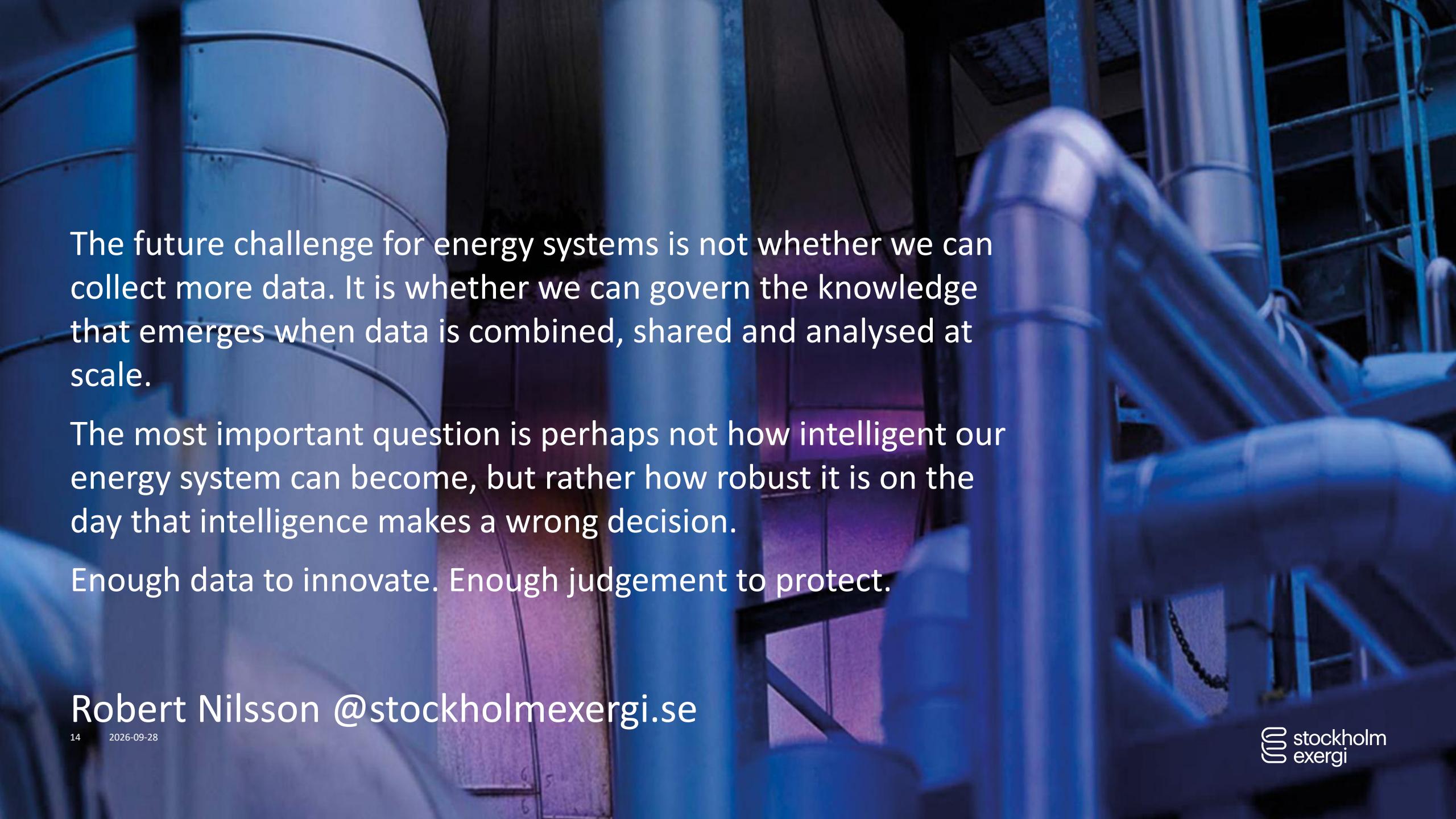
Dependencies

Which dependencies become visible?

Adversary

What would an adversary learn?





The future challenge for energy systems is not whether we can collect more data. It is whether we can govern the knowledge that emerges when data is combined, shared and analysed at scale.

The most important question is perhaps not how intelligent our energy system can become, but rather how robust it is on the day that intelligence makes a wrong decision.

Enough data to innovate. Enough judgement to protect.

Robert Nilsson @stockholmexergi.se

stockholm exergi