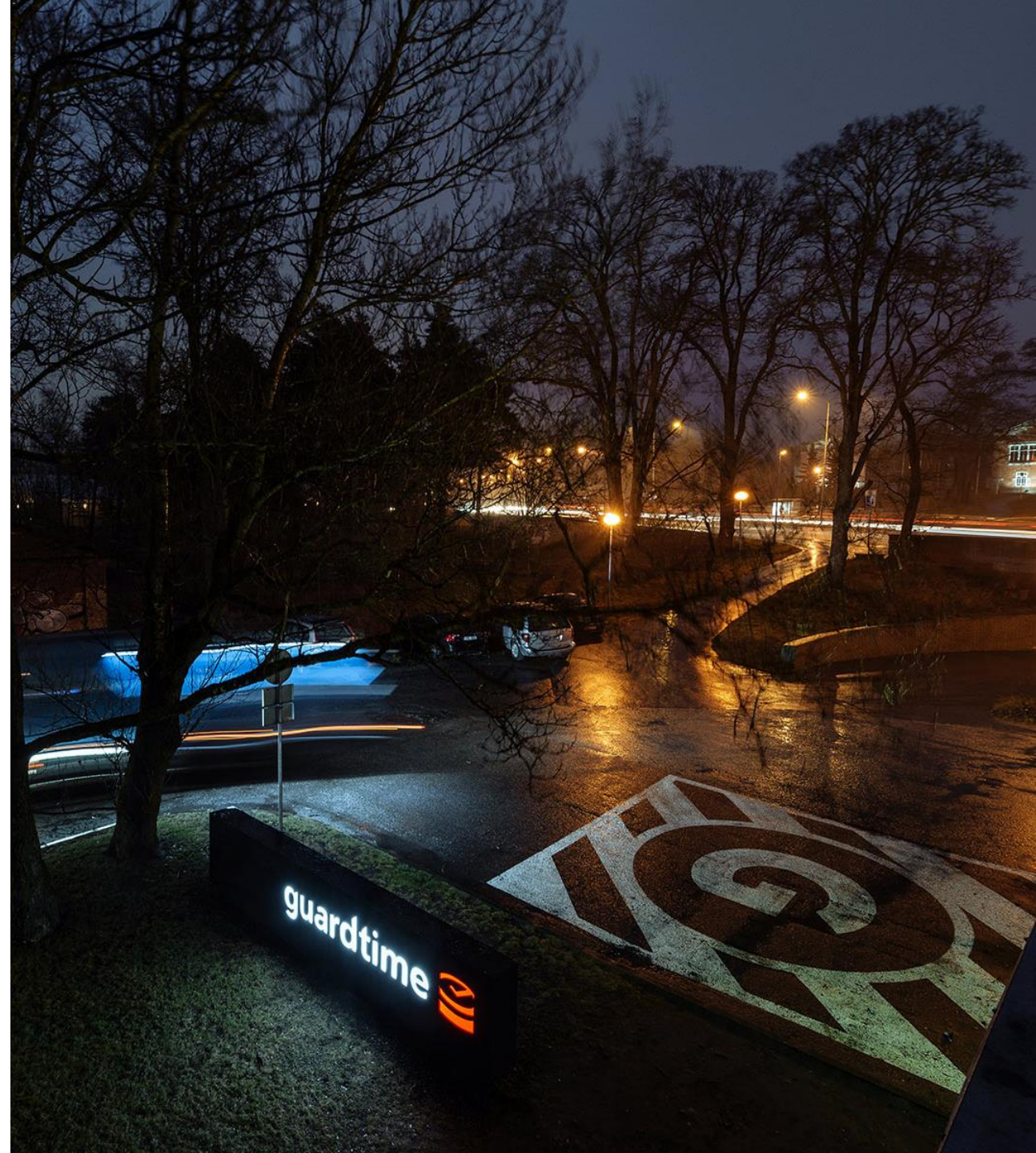# APPLICABILITY OF BLOCKCHAIN IN ENERGY SECTOR

IVO LÕHMUS

MEXICO 2018

GUARDTIME

/GOOGLE ORGANIZES THE WORLD'S INFORMATION GUARDTIME'S MISSION IS TO VALIDATE THAT INFORMATION AND MAKE IT UNIVERSALLY RELIABLE !

ENERGY CYBERSECURITY DRIVERS

1/

Smart Grid – more connections, more risk vectors

2/

New energy sources – more diverse network

3/

Tighter regulations

EVEN WITH TRADITIONAL CYBERSECURITY TOOLS, PROBLEMS REMAIN

1/

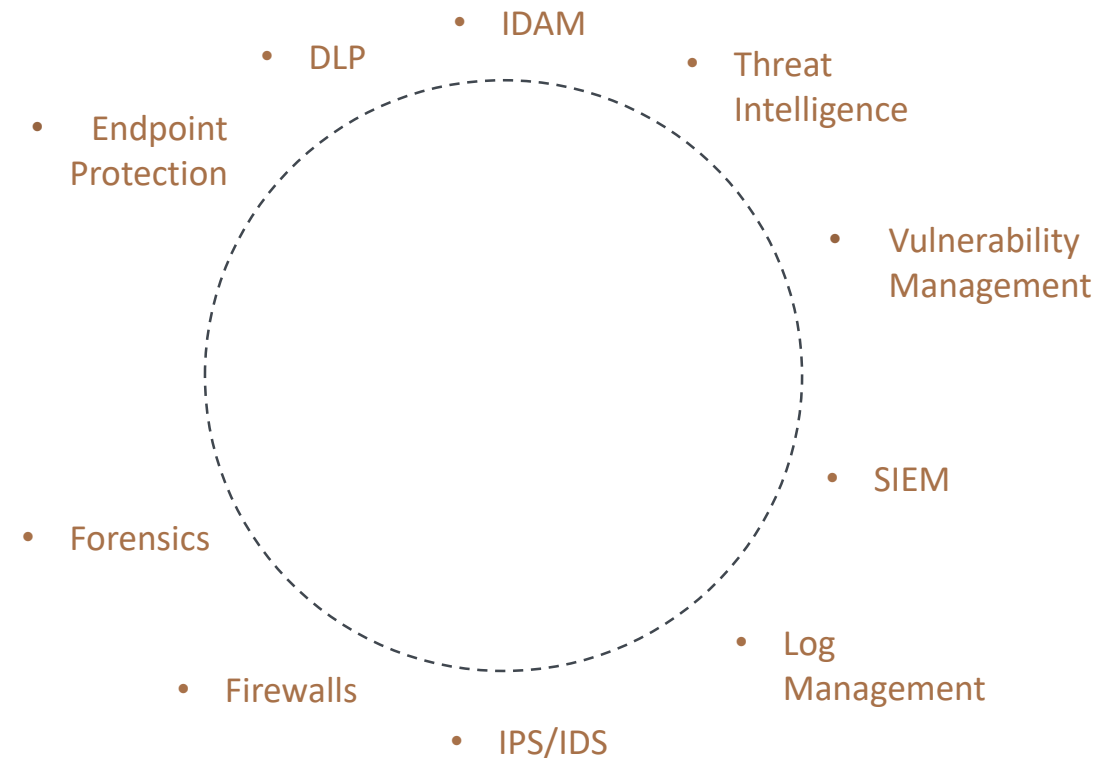Lack of cost effective and Purpose Built Tools for Securing, Tracking and Managing Grid Infrastructure

2/

Lack of Interoperable Protocols Limit Scalable and Cost-Effective Device Management and Credentialing

/3

Lack of Trust is Impeding Consumers' Engagement with Transactive Grids and Smart Infrastructure
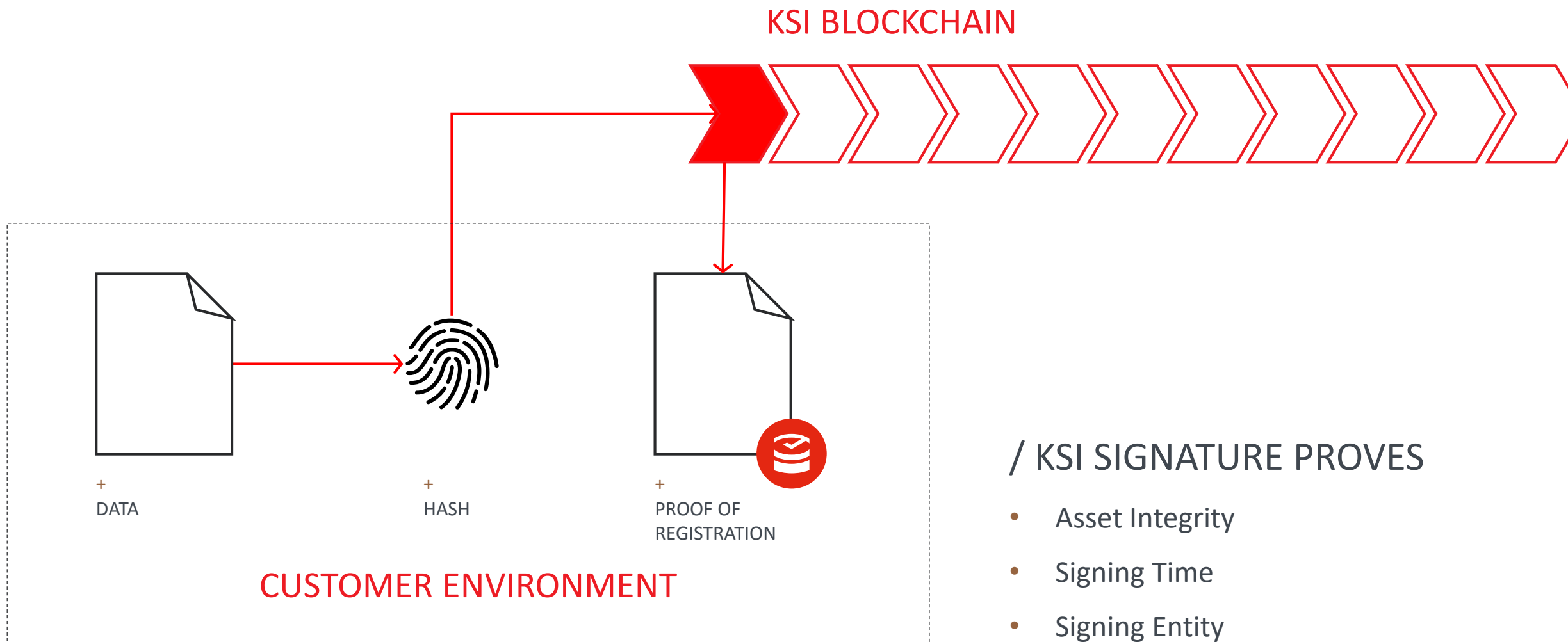
TRADITIONAL CYBERSECURITY TOOLS

- IDAM
- DLP
- Threat Intelligence
- Endpoint Protection
- Vulnerability Management
- SIEM
- Forensics
- Log Management
- Firewalls
- IPS/IDS

guardtime ®

BLOCKCHAIN MEETS ENERGY

LEVERAGING DIGITALIZATION — CYBERSECURITY IN THE POWER SECTOR

KSI BLOCKCHAIN
/HIGHLIGHTS

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KSI BLOCKCHAIN

+ DATA

+ HASH

+ PROOF OF REGISTRATION

CUSTOMER ENVIRONMENT

/ KSI SIGNATURE PROVES
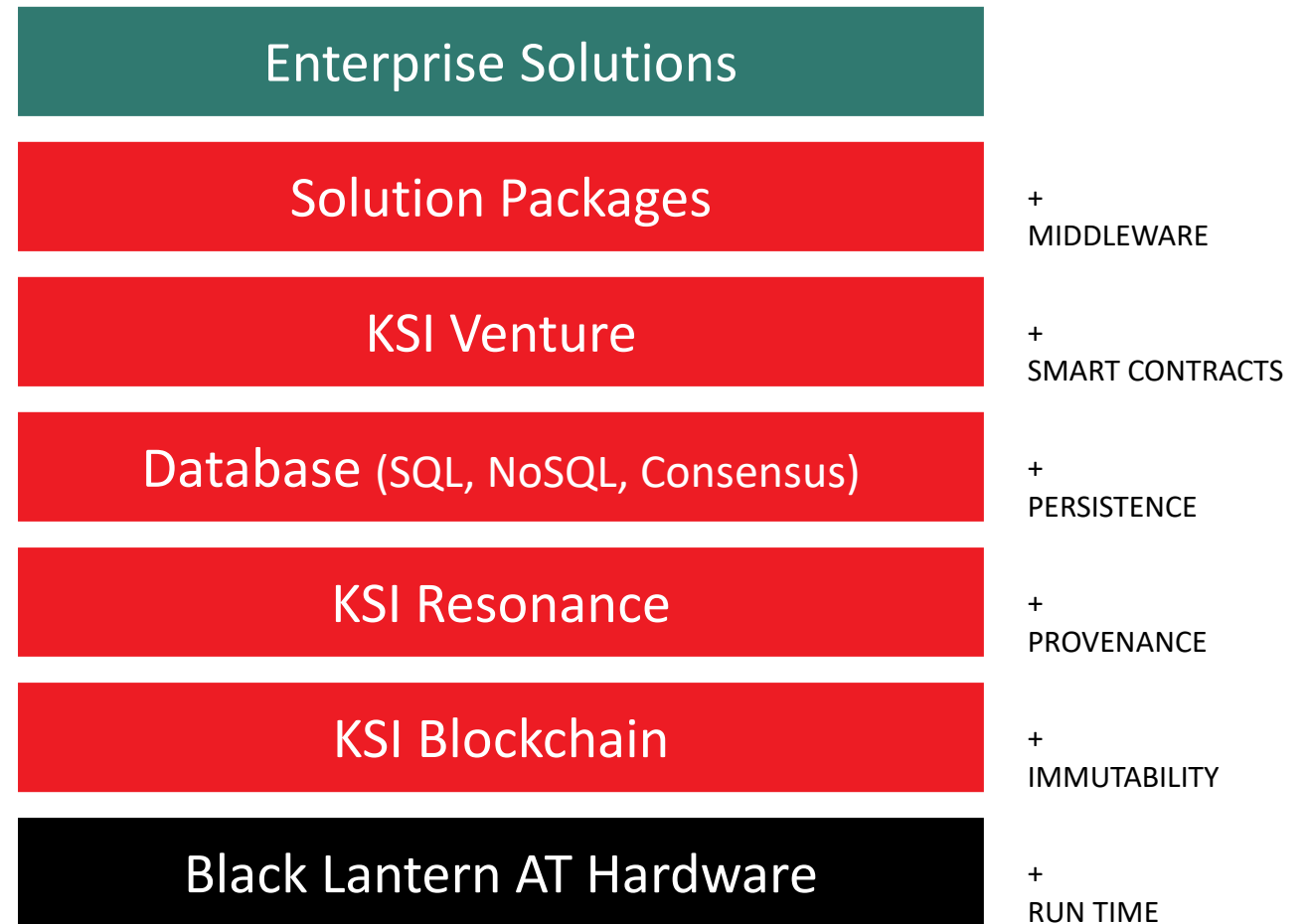
- Asset Integrity
- Signing Time
- Signing Entity

KSI
/STACK

Guardtime offers an end-to-end blockchain stack, from physical infrastructure to blockchain to middleware solution packages.

This is the Unix philosophy applied to blockchain. Abstraction and encapsulation of functionality into components which do one thing well.

Ultimately blockchain is just plumbing. Our mission in life is to leverage our platform and build enterprise products and solutions.

Layer	
Enterprise Solutions	
Solution Packages	+ MIDDLEWARE
KSI Venture	+ SMART CONTRACTS
Database (SQL, NoSQL, Consensus)	+ PERSISTENCE
KSI Resonance	+ PROVENANCE
KSI Blockchain	+ IMMUTABILITY
Black Lantern AT Hardware	+ RUN TIME

GUARDTIME GRIDAWARE
/OBJECTIVES

1/ COST REDUCTION

- Significant decrease in human inventory "touch" requirements for regulatory and industry standards

- Decrease in on site visits to remote locations for inventory and configuration confirmation

2/ RISK REDUCTION

- Significant decrease in safety concern with less site visits

- Rapid detection of tamper/misconfiguration of OT devices at remote locations

3/ PERFORMANCE

- Discovery and inventory management of OT devices

- Simplified configuration management and instant tamper detection of critical components

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CASE STUDIES

US DOE KEYLESS INFRASTRUCTURE SECURITY SOLUTION (KISS)

A TRUSTWORTHY PATH TO CYBER RESILIENCY

/ GOAL

- Increase the trustworthiness, speed, integrity and resiliency of energy delivery systems

/ SELECTED APPROACH

- Build secure and trustworthy transactive energy platform (in partnership with EDS vendors)

- Reduce the need for third-party intermediaries by utilizing blockchain based cryptographic proofs.

- Partner with universities and independent evaluators to achieve US Government System accreditation

INTERCONNECTING NATIONAL GRIDS

CROSS BORDER DATA EXCHANGE FOR FLEXIBILITY SERVICES

/ GOALS

- Cross border data Exchange for future flexibility services

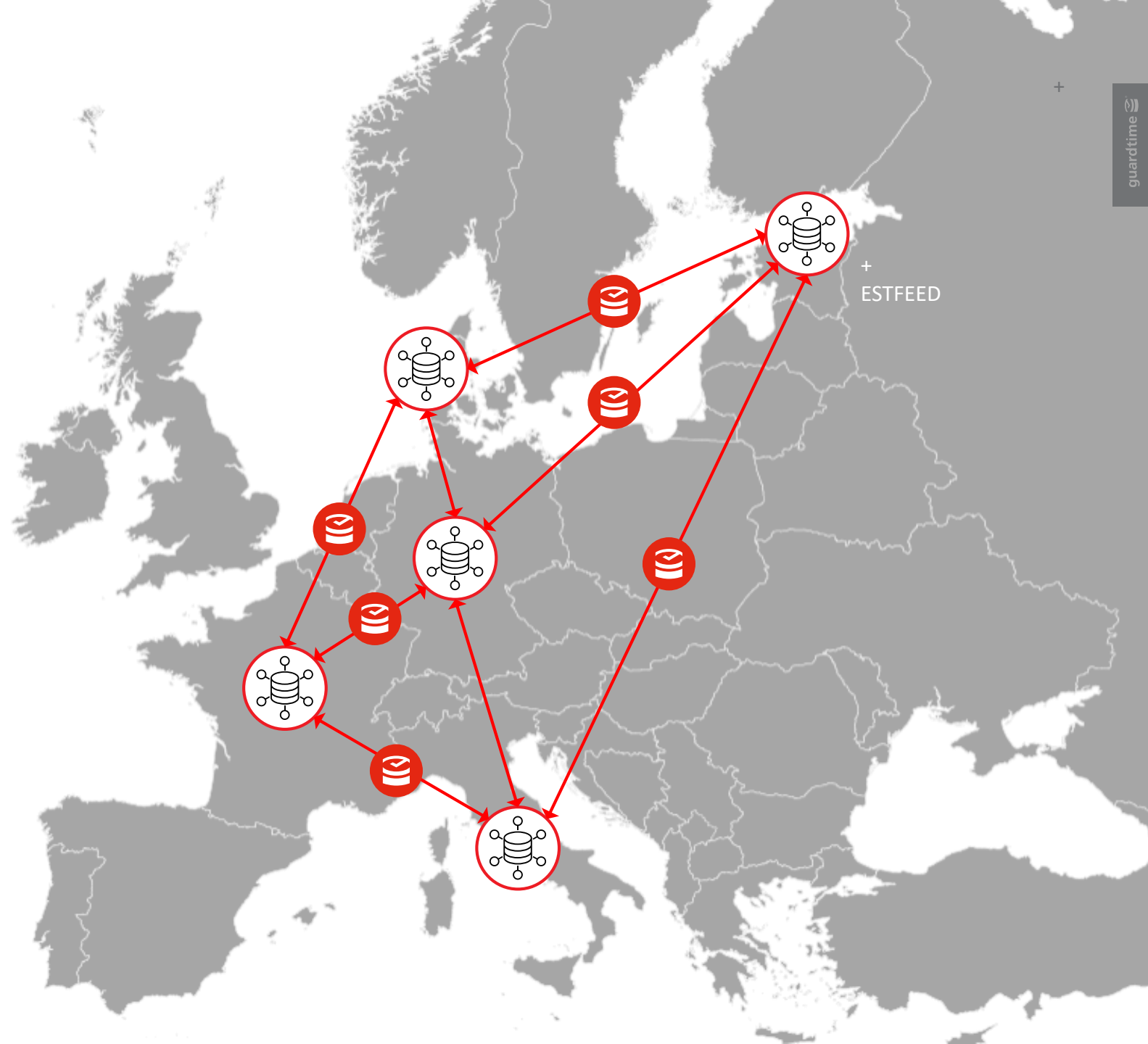- Third-party auditability & Regulations compliance

/ SELECTED APPROACH

- Federated blockchain platform approach for stand alone data hubs.

- Providing KSI blockchain as trust anchor for data exchange between national energy grids.

EUROPE'S DATAHUBS

How about pan-continental trading?

ESTFEED

CONCLUSIONS

/ FIRST PHASE OF THE PILOT SHOWED THAT WE CAN:

- Transfer data between member states hubs

- Prove cross border data ownership handling

- Meet regulatory compliance

/ VISION FOR FUTURE

- Cost effective pan-European energy data exchange platform

DISTRIBUTED ENERGY MARKETPLACE AND SECURE SMART METER DATA

AN ENABLER OF TRUSTED DATA FOR THE FLEXIBILITY SERVICES

/ GOALS

- Build a distributed energy trading platform

- Enable trusted energy consumption and production data exchange

- Comply with regulations (GDPR etc)

/ SELECTED APPROACH

- Cover **the full data cycle** from smart meter hardware to service / application provider

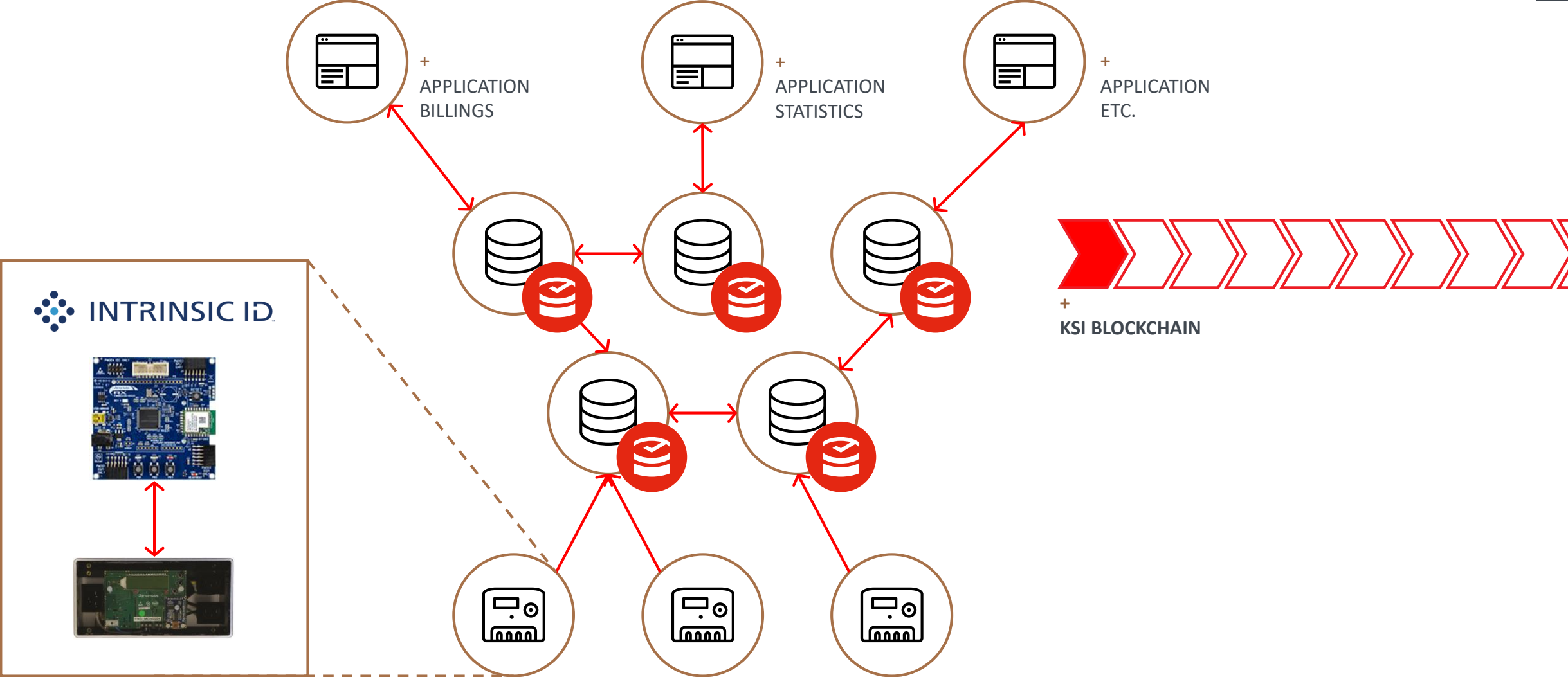- Use highest security solutions, including **on-chip signing** (combination of PUF technology and KSI blockchain.

Government of the Netherlands

BlockLab

INTRINSIC ID

SECURE SMART METER DATA EXCHANGE

CONCLUSIONS

/ FIRST PHASE OF THE PILOT SHOWED

- Data can be secured and transferred

- Data ownership handling proven

- Potential for mass-scale deployment

/ VISION FOR FUTURE

- Full-scale platform that collects and shares energy consumption on household level in 1-minute granularity.

THANK YOU!

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