IBM **Consulting**

AI in Electricity Utilities

Enabling Smarter, Cleaner, and more Resilient Electricity Systems






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IBM

APAC’s triple challenge is impacting the grid

Energy expansion, digital expansion and decarbonisation are now happening at the same time.

Affordability

Rising demand
Cooling, EVs, data centres

Reliability

Uninterrupted power despite volatility and ageing assets

Decarbonisation

Faster transition
Renewables, storage, flexibility

The grid operating model is shifting

from deterministic systems to probabilistic systems

TRADITIONAL

Centralised • predictable • one-way
Controllable generation

EMERGING

Distributed • weather-dependent • bidirectional
More variability, more participants, shorter cycles

The future grid is becoming too dynamic for traditional operating models alone.

AI as the Intelligence Layer

Strengthening four critical utility capabilities

Forecast

Optimise

Orchestrate

Respond

40%+ Utilities are using AI

Grid monitoring and optimisation AI adoption to rise from **26% in 2025** to

92% **by 2028.**

AI's strategic role is not just automation. It is coordination at system scale.

AI is moving from Promise to PERFORMANCE

Utilities using AI report measurable improvements across three areas:

Reliability

+11%
grid uptime

+10%
service reliability

-9%
incident response time

Grid Performance

+12%
load forecasting accuracy

-11%
technical energy loss

-7%
non-technical energy loss

Business Performance

+10%
energy efficiency

+11%
employee productivity

-10%
operational cost

*Source: **Utilities in the AI era,** IBM Institute for Business Value Report, 2025*

NESO

AI powered Open Balancing Platform

90%

Reduction in user input

37k

Metric tons of CO_2 saved since launch

£15M

Annual customer savings expected

South Australia

AI powered Virtual Power Plant

50k
Consumers covered

500
MW capacity

25%
Lower electricity rates vs. DMO

CASE STUDY 3

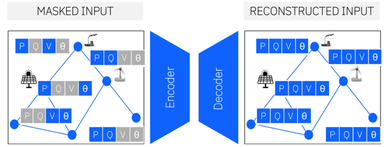
Grid FM

AI Foundation models for future Grid Intelligence

USE CASES

- Outage Prediction
- Renewable Forecasting
- Dynamic Estimations
- System Security
- Load Forecasting
- Disaster Recovery
- System Adequacy
- Dynamic OPF
- Vegetation Management

AI MODEL



DATA SOURCES

Weather | Load | Demand | Market | Network

SCADA | PMU | Equipment | AMI | Satellite

AI adoption in utilities is a challenge

The main challenges for AI-driven innovation are not technical but organizational.

Data & systems
Fragmented OT/IT, complex data integration, legacy infrastructure

Trust & safety
Low trust in AI recommendations, cybersecurity concerns

Skills & talent
AI and digital skills shortage across the workforce

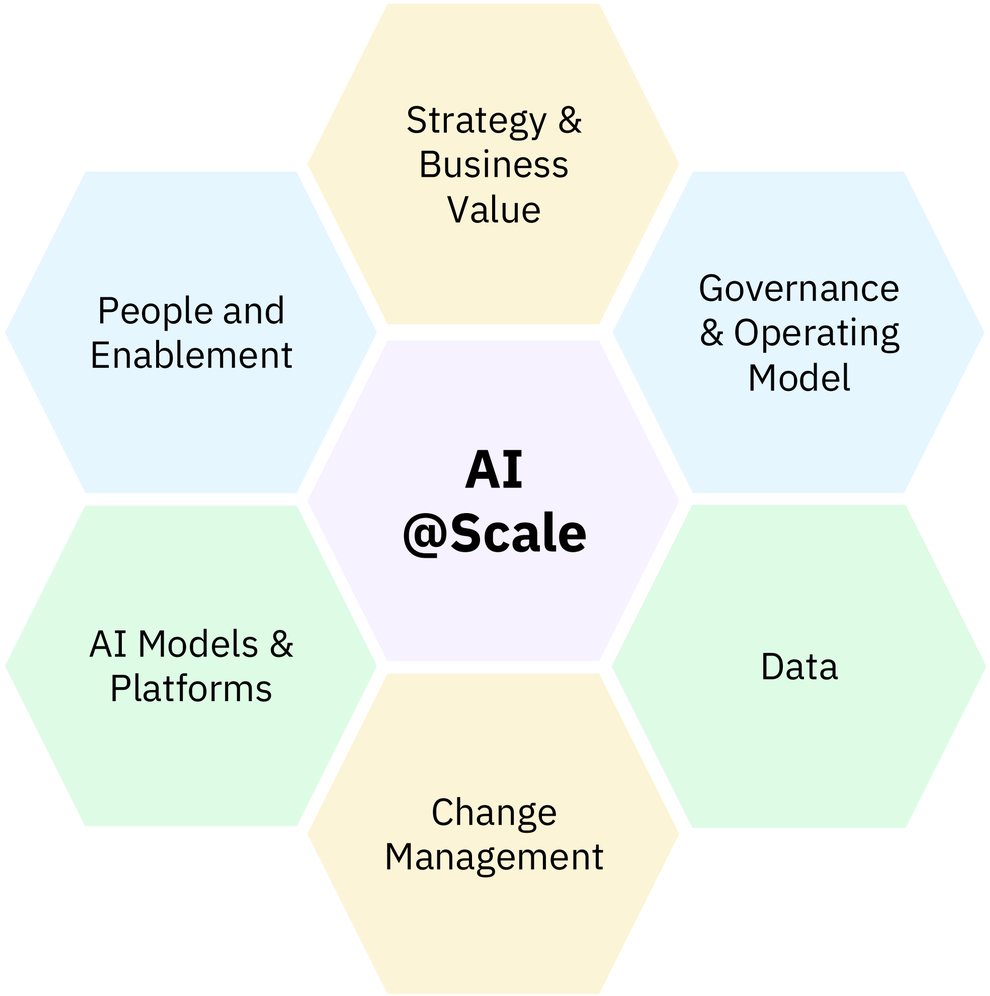
Governance & value
Unclear value tracking, governance gaps across operations

Utilities do not simply need AI models. They need AI operating models.

How to scale AI for Impact?

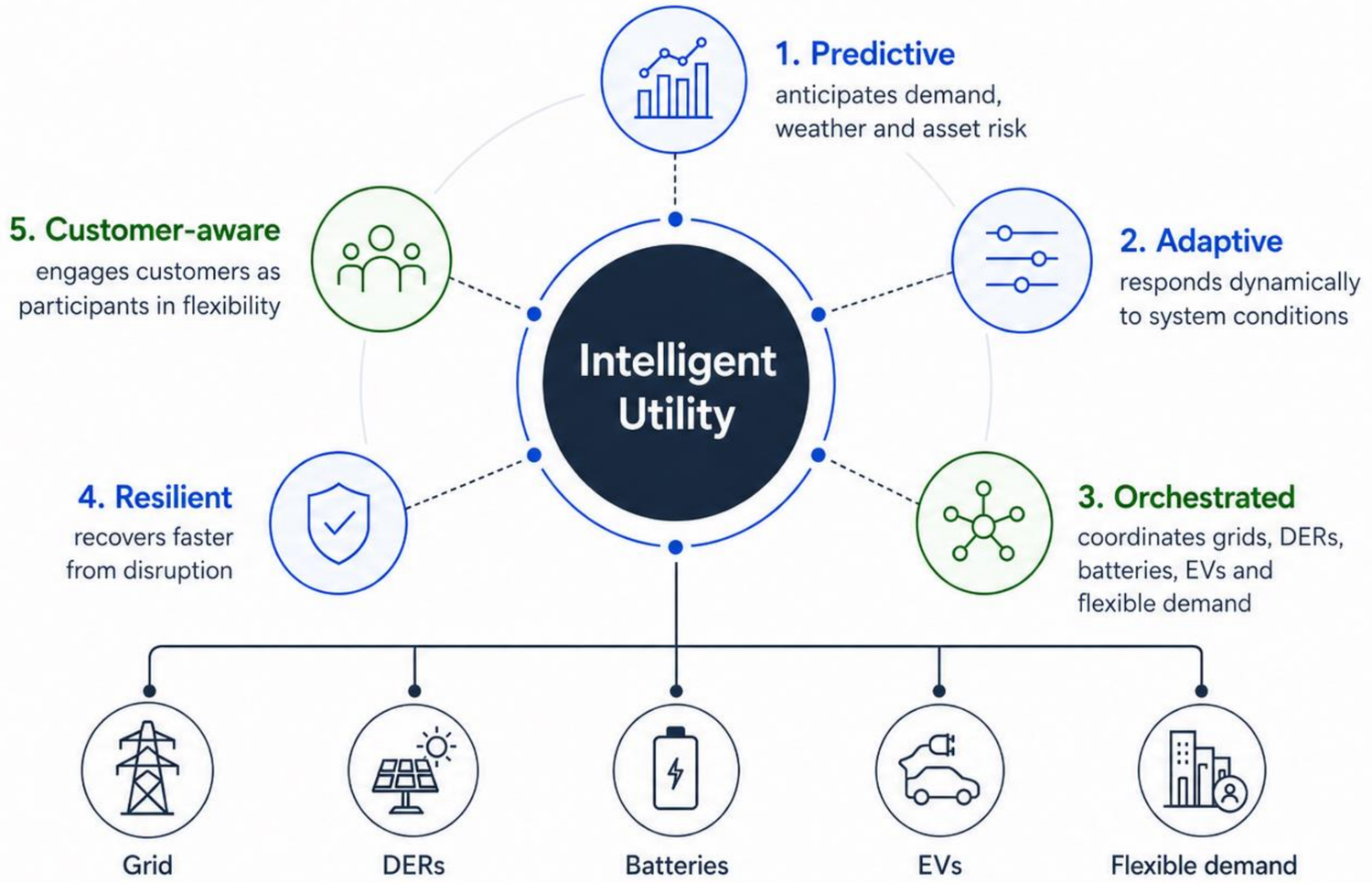
$4.5 B

Annual productivity savings achieved by IBM in 2025, using automation and AI across 70 workflows



The intelligent utility

From asset operator to orchestrator of distributed intelligence



Thank You!

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Accelerating the energy transition with AI…