Building on belief

Digital Arsenal for Energy Transition

Internet of things in utilities for a resilient, sustainable, and reliable future

A New Paradigm Shift for Utilities

- Renewables are rising at meteoric pace and traditional bulk power generation has to become flexible to provide stability to the grid and manage peak demand

- Distributed energy resources are going mainstream with grid-scale batteries and microgrids

- Consumers are becoming prosumers with roof top solar and electric vehicle integration picking pace, unlocking a $3-10 billion market opportunity for utilities

- The need for resilient and robust grid infrastructure has increased due to natural disasters and grid instability caused by renewables

- Cloud-based control and monitoring mechanisms have gained prominence due to their cost efficiency and scalability

Bringing Life to Things™

TCS leverages an IoT business framework
to unlock exponential value for its customers

Bringing Life
to Things™

Physical Context
+
Digital Intelligence

Business Dimensions

Technical Dimensions

Business Value
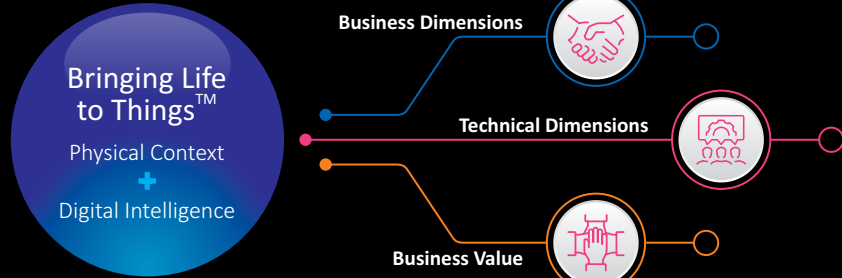
- Boundaryless
- Pervasive
- Experience Rich

- Connect in Context
- Predictive
- Self-Aware

TCS IoT Bringing Life To Things helps utilities respond to a physical context with digital intelligence by leveraging emerging ecosystems, embracing risk, creating new business models, providing seamless customer experience, and unlocking exponential value

Enterprises first need to **connect in context** to enhance visibility in their operations to gain insights and diagnostic capabilities

Enterprises can develop **predictive** capabilities leveraging AI, ML, and advanced analytics to master routine decision making through 'things'.

Enterprises can reach a **self-aware** state, with self organizing, self-healing, self-optimizing, and autonomous systems that act intelligently and work synchronously

Boundaryless intelligence with digital twin solutions can help enterprises with AI-driven sustainable operations

Enterprises can ensure **pervasive** secure collaboration with Connected Worker & IT-OT security

Enterprises can offer **rich customer experience** with value added services services on energy efficiency and with responsive service fleet management

Utilities Next

Unlocking Exponential Value across the Utilities
Value Chain with Next-Generation Use Cases

tcs IP2™
tcs Clever Energy™
tcs InTwin™
tcs DigiFleet™
tcs Connected Worker™
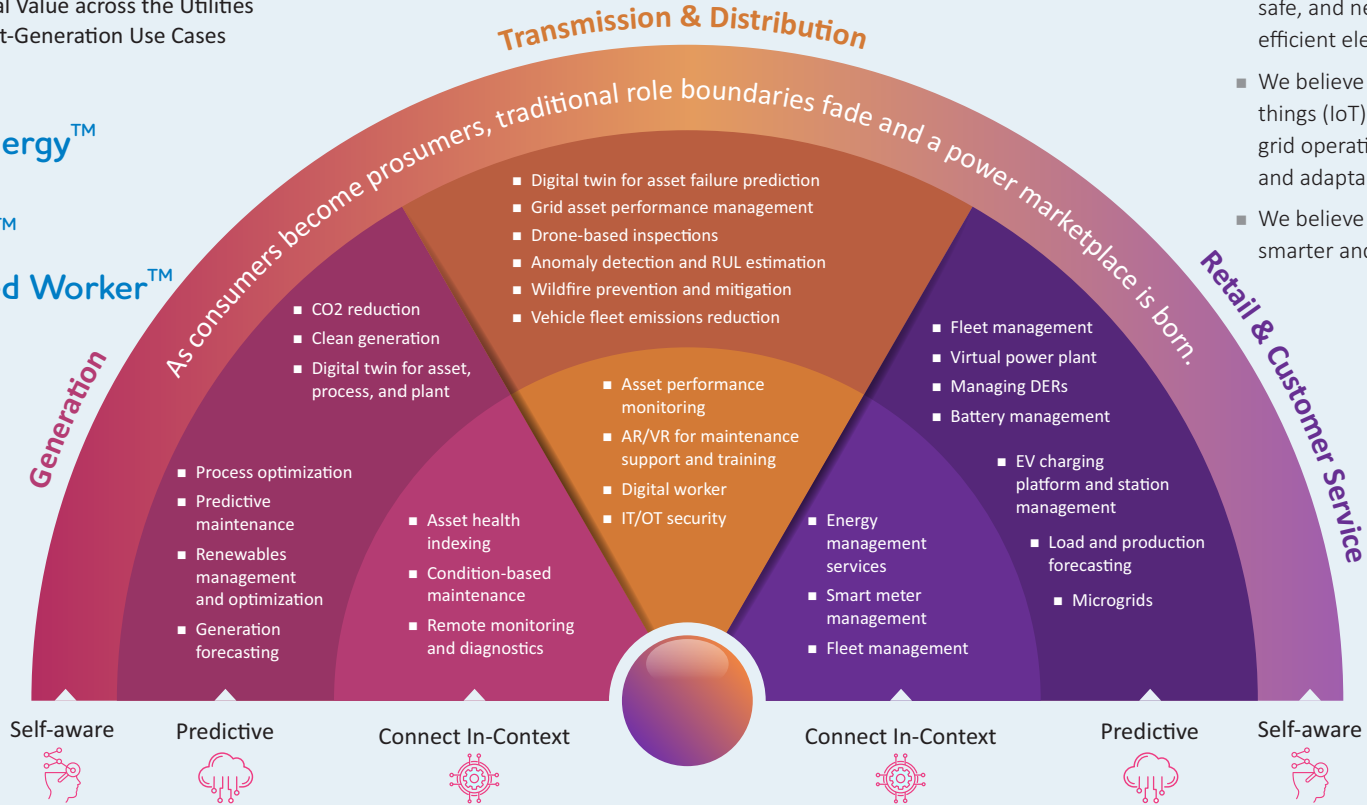
- We believe in creating a clean, safe, and net-zero future with efficient electric power systems
- We believe that the internet of things (IoT) will transform utility grid operations with resilience and adaptability by design
- We believe in making the grid smarter and robust

Transmission & Distribution

As consumers become prosumers, traditional role boundaries fade and a power marketplace is born.

Generation

- CO2 reduction
- Clean generation
- Digital twin for asset, process, and plant

- Process optimization
- Predictive maintenance
- Renewables management and optimization
- Generation forecasting

- Asset health indexing
- Condition-based maintenance
- Remote monitoring and diagnostics

Transmission & Distribution

- Digital twin for asset failure prediction
- Grid asset performance management
- Drone-based inspections
- Anomaly detection and RUL estimation
- Wildfire prevention and mitigation
- Vehicle fleet emissions reduction

- Asset performance monitoring
- AR/VR for maintenance support and training
- Digital worker
- IT/OT security

Retail & Customer Service

- Fleet management
- Virtual power plant
- Managing DERs
- Battery management

- EV charging platform and station management

- Energy management services
- Smart meter management
- Fleet management

- Load and production forecasting
- Microgrids

Self-aware | Predictive | Connect In-Context | Connect In-Context | Predictive | Self-aware

Boundaryless Intelligence with Digital Twin for Sustainable Operations

tcs IP2™

To enable flexible, clean, and cost-competitive power generation

Intelligent Power Plant Solution

TCS IP2 is a digital twin-based PaaS solution that combines AI, ML, IoT, and digital twin technologies for power plants. It provides futuristic insights and precise decisions to help power plants realize their net-zero ambitions and keeps operating costs low.

KNOW MORE

TCS IP2 has helped a Japanese utility reduce costs by $1.5-2 million per year

- Plant efficiency improved by about 1%
- Emissions decreased by 9%
- Dispatchable power increased by 1%
- Accuracy of failure predictions rose to more than 85%
- AI-based real-time set point advisory for operators

tcs InTwin™

To perform industrial analytics and build digital twin at scale across the enterprise

Industrial AI Platform

TCS InTwin, available on hyperscaler platforms and on-premise environments, helps enterprises across industries rapidly create, manage, and deploy advanced digital twins of critical assets and processes, augmented with AI capabilities.

KNOW MORE

A multinational steel-making company leveraged InTwin to optimize the sintering process

- Real-time prediction and monitoring of KPIs
- 5% improvement in productivity
- Process blend design optimization
- 2% reduction in fuel costs
- Potential savings of $4 million per annum

Pervasive Secure Collaboration

tcs Connected Worker™

To ensure safety, productivity, and compliance for field and office workers

TCS Connected Worker

Designed for field workers, the solution digitalizes field operations, boosts workforce collaboration, enhances real-time information interaction, and provides immersive learning experiences with technologies such as AR/VR, wearables, image analytics, mobility, IoT and Digital Twins

KNOW MORE 👆

Global agriculture major uses IoT to safeguard its employees from COVID-19

- Created a digital fence around the workplace
- Implemented protocols to set industry standards for health and safety
- Monitored movement of more than 350 employees at their workspace
- Reduced total injury frequency rate (TIFR)

TCS IT-OT Security

To secure operational technology (OT) data infrastructure and safeguard against cyberattacks

TCS IT-OT Security combines several services such as security risk assessment, IT-OT managed security services, and OT security remediation solutions to provide continuous visibility into vulnerabilities and threats. The services reduces the total cost of ownership (TCO) for ongoing OT security management and minimizes disruptions due to cyberattacks.

KNOW MORE 👆

UK utility implements OT security to protect its critical infrastructure against cyberattacks

- Met OT business goals and vision
- Met compliance and regulatory requirements
- Integrated OT assets and information with ISO 27001:2013

Experience Rich Customer Services

tcs DigiFleet™

To manage and optimize the operations
of vehicles of the field service workforce

IoT Freight Management Solution

TCS DigiFleet™ leverages AI and ML to analyze data and
optimize fleet and freight operations across industry value
chains. It is a ready-to-deploy solution efficiently handling
heterogeneous sensor data and seamlessly integrates into
enterprise systems.

KNOW MORE

Global mining major deployed TCS Digifleet™ to optimize fleet and asset operations

- 30% improvement in asset utilization
- 23% improvement in productivity
- 209 hours of reduced downtime
- 5% reduction in maintenance costs

tcs Clever Energy™

To create new revenue streams by offering value-added
energy management services to business and
commercial customers

Energy Management System

Powered by IoT, AI, and the cloud, TCS Clever Energy
helps commercial and industrial organizations become
more sustainable and energy efficient, decrease
carbon emissions, and reach their net-zero goals

KNOW MORE

Middle eastern retail major deployed the energy management solution to achieve energy reduction goals

- 12% annual energy savings
- 200% return on investment achieved
  over five years
- Remote asset monitoring, consumption
  optimization, and accurate prediction
  of energy needs
- Outcome-based and risk reward
  commercial model

Our Advantages

Deep expertise across IT & OT systems: Hands-on expertise and scaled experiences in designing, deploying, and integrating plant OT systems with IT systems securely

Value-focused business models: Unique outcome-based and gain-share commercial models

Domain-led and technology-driven approach: Experts with decades of domain expertise on solutions and services

Ecosystem of complementing innovation partners: Diverse partner ecosystem across all IoT layers- edge, platform, sensors, communication, security, and analytics

Strategic partner of hyper-scaling IoT platforms: Experienced in scaled customer deployments of millions of devices across continents through hyperscalers such as Azure, Amazon Web Services, and Google Cloud Platform

Technology centers of excellence for rapid innovation: Over 10 IoT labs and centers of excellence across the globe for research, innovation, and rapid prototyping

Awards and recognition

Zinnov ranked TCS in the leadership zone for IoT Technology Services, 2021 for five consecutive years

IDC ranked TCS as a leader in Business and Industrial IoT Consulting and System Integrator Services for 2020

Nelson Hall ranked TCS as a leader in IoT Digital Transformation for 2019

Everest ranked TCS as a Leader and Star Performer in the IoT Services PEAK Matrix, 2020

Forrester Research recognized TCS as a leader in IoT services in Asia-Pacific for Q2 2020

HFS Research ranked TCS among its top three leading IoT service providers for 2020

Everest Group recognized TCS as a leader for Industry 4.0 services

TCS Clever Energy won the 2020 IoT Global award for its unique proposition

Awards & Recognition

About Tata Consultancy Services Ltd (TCS)

About Tata Consultancy Services Ltd (TCS) Tata Consultancy Services is a purpose-led transformation partner to many of the world's largest businesses. For more than 50 years, it has been collaborating with clients and communities to build a greater future through innovation and collective knowledge. TCS offers an integrated portfolio of cognitive powered business, technology, and engineering services an d solutions. The company's 469,000 consultants in 46 countries help empower individuals, enterprises, and societies to build on belief.

For more information, visit us at **www.tcs.com.**