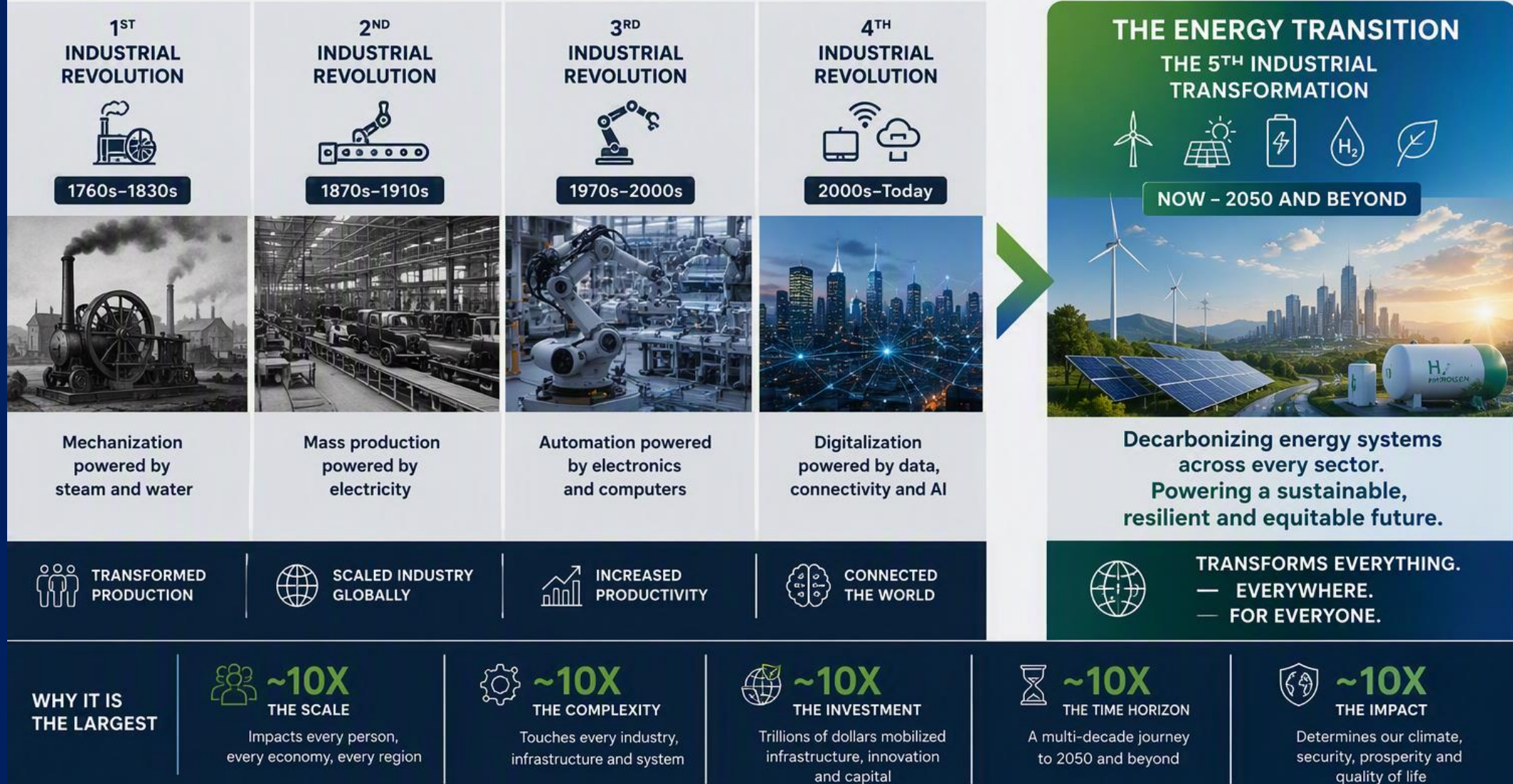


UK Industry's Role and its Challenges in Driving and Delivering an International Energy Transition

Helena Rivers, AECOM

ENERGY TRANSITION: THE LARGEST INDUSTRIAL TRANSFORMATION IN HISTORY

More pervasive. More complex. More critical than any transformation before.



THIS IS NOT JUST ANOTHER CHANGE. THIS IS OUR DEFINING TRANSFORMATION.

ENERGY TRANSITION: UNCERTAINTY IS REAL. ACTION IS ESSENTIAL.

Navigate uncertainty. Build resilience. Deliver a secure, affordable energy future.

UNCERTAINTY

Many unknowns.
Multiple possible paths.

- ? Geopolitics and policy
- ? Technology evolution
- ? Markets and commodities
- ? Supply chains and critical minerals
- ? Climate risks and physical impacts

CATALYSTS FOR ACTION



RESILIENCE

Build systems that withstand shocks and adapt



AFFORDABILITY

Deliver reliable energy at a cost people and economies can afford



SECURITY

Strengthen energy security and reduce vulnerabilities

THREE IMPERATIVES.
ONE SHARED GOAL.



COLLECTIVE ACTION TODAY

By governments, industry, investors and communities.

WHAT IS CERTAIN



DEMAND GROWTH IS CERTAIN

Population, development and electrification will drive energy demand higher.



THE SCALE IS UNKNOWN

How much and how fast demand will grow remains uncertain.



THE TECHNOLOGY MIX IS UNKNOWN

The mix of fuels and technologies to meet that growth is not yet known.

← UNCERTAIN PATHS

SHARED PURPOSE →

THE PATH FORWARD: ADAPT. INVEST. INNOVATE. COLLABORATE.



STAY AGILE

Continuously monitor, learn and adapt.



INVEST FOR THE FUTURE

Mobilize capital for resilient and reliable energy systems.



INNOVATE TO SOLVE

Advance technologies and business models.



COLLABORATE WIDELY

No single solution. Stronger together.



UNCERTAINTY IS REAL.
BUT OUR COMMITMENT
TO ACTION IS GREATER.

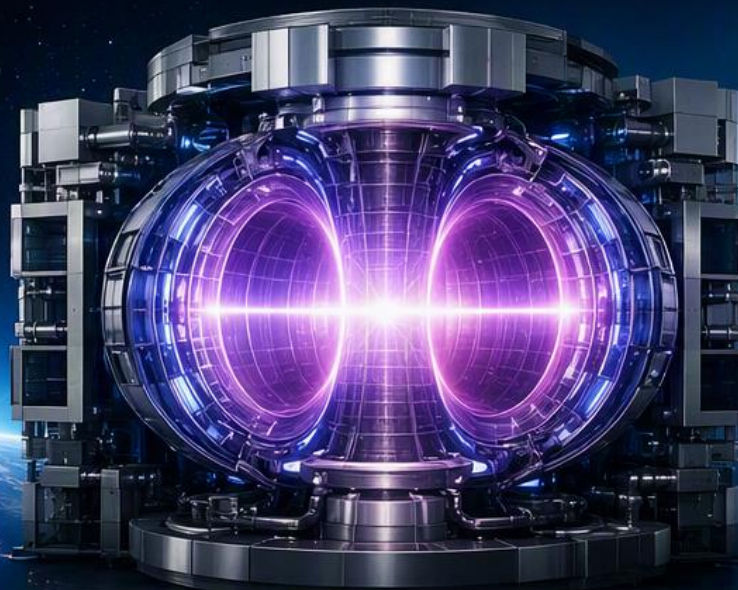
A SECURE, AFFORDABLE AND
SUSTAINABLE ENERGY FUTURE
IS WITHIN OUR REACH.

FUSION POWER

THE ANSWER TO OUR FUTURE ENERGY NEEDS

Limitless. Clean. Safe. Secure.

Fusion has the potential to deliver abundant, affordable energy for everyone, for generations.



WHY FUSION?



VIRTUALLY LIMITLESS FUEL

Deuterium from water. Tritium bred from lithium. Fuel for thousands of years.



CLEAN AND LOW CARBON

No greenhouse gases. Minimal waste. Better for our planet.



SECURE AND RESILIENT

Domestic fuel sources. Energy independence. Stronger national security.



ECONOMIC AND JOB CREATING

High-value jobs. Investment. Growth across the UK and beyond.



SAFE BY DESIGN

Fusion reactions naturally self-regulate. No risk of meltdown.



UK STEP FUSION PROGRAMME

A BOLD NATIONAL MISSION. A GLOBAL IMPACT.

The UK is a world leader in fusion research. Through the STEP programme, we are accelerating the path to a commercial fusion power plant – delivering clean, secure energy and long-term prosperity.



WORLD-LEADING SCIENCE

Decades of UK innovation in fusion research and talent.



STRONG INDUSTRY PARTNERSHIPS

Bringing together industry, SMEs and supply chains.



SUSTAINING UK SUPPLY CHAINS

Investing in skills, capability and advanced manufacturing.



DRIVING GROWTH ACROSS THE UK

High-value jobs and regional economic opportunities.



UNITING UK INDUSTRY, ACADEMIA AND GOVERNMENT

OUR PATHWAY TO A FUSION POWER PLANT

RESEARCH & DISCOVERY



TODAY

DESIGN & TECHNOLOGY



2020s

STEP PROTOTYPE PLANT



2030s

COMMERCIAL FUSION POWER



2040s

FROM LABORATORY BREAKTHROUGHS TO CLEAN ENERGY FOR BRITAIN AND THE WORLD

FUSION: POWERING A BETTER FUTURE



Reliable 24/7 baseload power



Supports net zero



Enables hydrogen production



Provides clean water via desalination



Powers AI, data centres and industry



THE UK ADVANTAGE

- ✓ Global leader in fusion research
- ✓ Strong universities and talent pipeline
- ✓ Deep industrial expertise
- ✓ Government commitment through STEP
- ✓ A trusted international partner

**FUSION IS WITHIN OUR REACH.
STEP WILL GET US THERE.**

**CLEAN ENERGY.
LIMITLESS POSSIBILITIES.
A BRIGHTER FUTURE FOR ALL.**



**PIONEERING FUSION.
POWERING TOMORROW.**

DIGITALLY ENABLED FLEXIBILITY TO UNLOCK CAPACITY EQUIVALENT TO MAJOR INFRASTRUCTURE INVESTMENT



Use smarter.



Use differently.



Unlock more.

A SMARTER, MORE AFFORDABLE
ENERGY SYSTEM FOR ALL.



TRADITIONAL APPROACH: BUILD MORE

Meeting demand through infrastructure alone



High capital investment



Long lead times

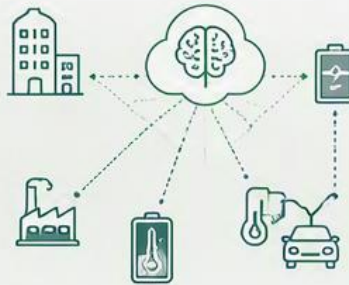


Planning, land and delivery challenges

VS

DIGITALLY ENABLED FLEXIBILITY: USE SMARTER

Unlocking existing capacity through intelligent, real-time flexibility



Low cost to deploy



Fast to implement



Scalable and future-ready



Better use of existing assets

Builds capacity slowly. Higher cost. Greater disruption.

Unlocks capacity now. Lower cost. Minimal disruption.

DELIVERS REAL SYSTEM BENEFITS



REDUCE NETWORK REINFORCEMENT REQUIREMENTS

Defers or avoids expensive network upgrades by managing demand and generation intelligently.



IMPROVE SYSTEM EFFICIENCY

Optimises supply and demand in real time, reducing losses and making better use of existing infrastructure.



LOWER OVERALL SYSTEM COSTS

Reduces the need for new assets and lowers operational costs – savings passed on to consumers.



ENHANCE RELIABILITY AND RESILIENCE

Provides fast, flexible response to change, strengthening reliability and supporting a secure, resilient energy system.

HOW IT WORKS



SENSE & FORECAST

Real-time data and AI predict system conditions and potential constraints.



DECIDE & OPTIMISE

Advanced analytics identify the best flexibility options across the system.



ACTIVATE & COORDINATE

Automated signals coordinate millions of flexible assets in real time.



UNLOCK CAPACITY

Relieve constraints and meet demand without building new infrastructure.

FLEXIBILITY TODAY. CAPACITY TOMORROW.



Supports Net Zero at lower cost



Empowers consumers and communities



Enables innovation and new services



Builds a smarter, stronger energy future

SMARTER THAN BUILDING MORE. FLEXIBILITY UNLOCKS THE ENERGY FUTURE.

THERE IS NO ENERGY TRANSITION WITHOUT NETWORKS AND THE GREAT GRID PROGRAMME

Net zero by 2050.
Energy security today.

It all depends
on a network
fit for the future.



POWERING
A CLEAN FUTURE



CONNECTING
COMMUNITIES



SECURING
OUR ENERGY



DRIVING GROWTH
AND JOBS

OUR ENERGY FUTURE DEPENDS ON A MODERN, RESILIENT AND EXPANDED NETWORK.



Connecting clean
energy where
it's generated



Powering homes,
businesses and
communities



Enabling economic
growth and
industrial jobs



Strengthening
energy security
across the UK



Supporting a
sustainable,
affordable future

CLEAN ENERGY

+

STRONG NETWORKS

=

A BETTER FUTURE FOR ALL



Abundant, homegrown
renewable energy



Building and upgrading the grid
to move energy securely
and efficiently



Lower bills over time, energy security,
jobs, growth and a cleaner
environment

THE GREAT GRID PROGRAMME

Building the backbone of Britain's clean energy future



INVESTING AT SCALE

Unprecedented investment to expand and
reinforce our electricity networks.



BUILDING FOR THE FUTURE

New infrastructure, smarter systems and digital
innovation for a more flexible grid.



DELIVERING NATIONWIDE BENEFITS

Reliable energy, lower costs over time and
opportunities for communities.



WORKING TOGETHER

Government, industry and communities –
delivering The Great Grid Programme together.



THE GREAT GRID PROGRAMME:
POWERING THE UK'S FUTURE.



RELIABLE TODAY



READY FOR
TOMORROW



BUILT FOR
EVERYONE



DELIVERING NET ZERO
TOGETHER

What is Industry Asking for?



Long Term Policy Consistency



Faster planning and consenting



Investable Market Frameworks



Strategic Energy Infra planning



Skills



Genuine Partnership

How Can Industry Accelerate the Transition?

