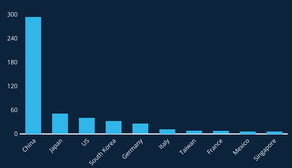
The Electricity Economy

The Age of Automation

Number of industrial robots installations (2022)



Source: Industrial Federation of Robotics

AI and Robotics are set to accelerate the automation of production

Now: **Labour** based pricing

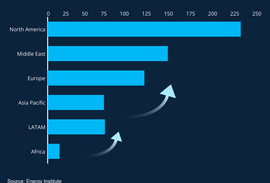
Future: **Joules** based pricing

Powering the Planet

Electricity demand may increase by as much as 100% by 2030, due to

I. Global power divide

Energy consumption per capita in 2023 (GJ)



Source: Energy Institute

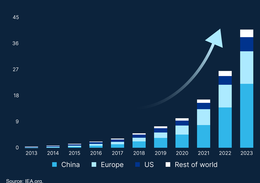
II. The Data Deluge

Global datacenter electricity demand (TWh)

Source: IEA.org

III. Electrifying mobility

Global electric car stock



Source: IEA.org,
Note: includes hybrids

Energy Mix and Choices

Nuclear ranks best for those looking for reliable, abundant and carbon free

`Electricity Source	% Global Electricity generation 2023	Approx. LCOE Range (USD/MWh)	Reliability	Abundance	Carbon-Free?
Coal	35.51%	65-150			
Natural Gas	22.46%	45-90			
Hydroelectric	14.30%	40-110			
Nuclear	9.11%	80-150			
Wind	7.82%	30-50			
Solar	5.53%	25-50			
Biomass	2.30%	55-110			
Geothermal	0.30%				

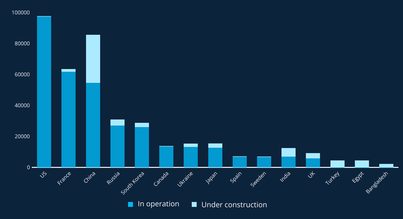
Source: Statistica, Lazard LCOE June 2024
Note: Levelised Cost of Energy (LCOE)

Key

China is Betting Big on Nuclear

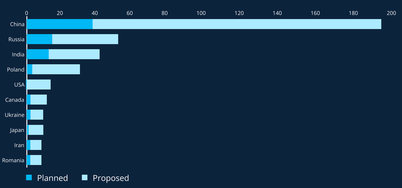
China is expected to overtake the US in Nuclear Energy Capacity by 2030

Nuclear capacity by country (MWe)



Source: World Nuclear Association

Number of reactors planned and proposed



Source: World Nuclear Association

Nuclear Technology is Improving Rapidly

Small Modular Reactors (SMRs) and Gen 3+ Nuclear promise improved safety and better economics

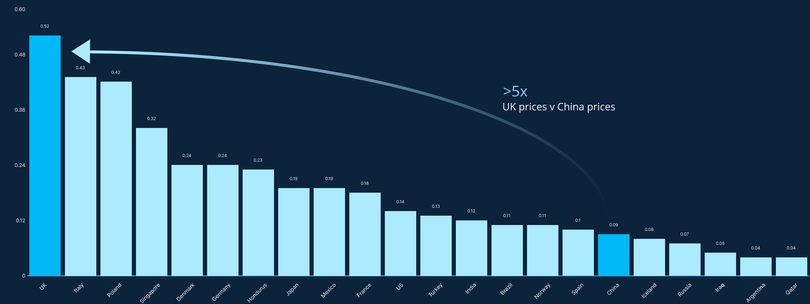
Feature	Gen 1	Gen 2	Gen 3	Gen 3+	SMRs
Approximate Site Size (hectares)	40-100+	40-100+	40-100+	40-100+	10-20
Time to Build (years)	7-10+	7-10+	5-7+	5-7+	2-5 (potentially less)
Refueling Cycle (years)	12-18 months	12-18 months	18-24 months	18-24 months	2-7 years
Scalable	Limited	Somewhat	Yes	Yes	Highly
Max Power Output (MWe)	<600	600-1600+	1000-1400	1600-1700+	<300 (individual unit)
Estimated LCOE (USD/MWh)	80-120+	60-100+	50-90+	50-90+	60 120+ (lower with economies of scale)
Examples	Magnox, Early PWRs	CANDU, BWRs	ABWR, EPR	ABWR, EPR	NuScale, Rolls Royce SMR
Key Characteristics	Early prototypes, varied designs	Improved designs, increased safety	Standardized designs, enhanced safety features	Standardized designs, enhanced safety features	Small footprint, modular construction, potential for diverse applications

Sources: World Nuclear Association, Nuclear Energy Agency, International Atomic Energy Agency, US Energy Information Administration

The Price of Power

Small Modular Reactors (SMRs) and Gen 3+ Nuclear promise improved safety and better economics

2024 average electricity prices for industrial users (USD per KWh) by country



Source: IEA.org

KPMG