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10 ways AI can power energy, resources and industrials

1 Individualise energy consumption

AI can accurately forecast consumer energy demand which can inform future energy contracts whilst reducing peak-load on the network.

AI can track individual electricity demand and make recommendations for consumers to recharge items, such as electric vehicles, at optimal times.

2 Forecast and assist utilities demand

AI can forecast electricity demand by identifying patterns in vast data sources, meaning service outages can be minimised.

By leveraging digital twin technologies, AI can optimise and predict a transport systems utilisation, minimising congestion and reducing carbon emissions.

When service outages are unavoidable, AI can help utility companies automatically issue warnings to their customers and keep them updated with expected resolution times.

FACT Machine learning models are being used to significantly improve the forecasting accuracy of energy consumption. Read more.

3 Keep downtime, down

AI technologies can analyse the patterns of individual machines to determine its actual maintenance needs and create a customised schedule that minimises overall downtime on a factory floor.

AI can identify patterns in sensor data to identify which machine parts are most likely to fail. These results can be further analysed to understand the correlation between critical parts' performance and the quality of product output.

Downhole sensing technologies can transmit real-time data to inform how oil wells and pipelines are performing and forecast daily gas production whilst also alerting operations teams about leaks or malfunctions.

FACT Digital twin technology is being used by a global energy giant to save $1.7 billion per year in predictive maintenance. Read more.

4 Improve workforce safety and support

AI technologies can identify dangerous working conditions and provide workers with automated alerts to avoid incidents.

AI capabilities can be applied to complex industrial activities. AI can supplement a human operator's capabilities, helping them make better decisions and avoid human error.[2]

Field workers looking for targeted answers can access consolidated data through AI-fuelled web portals, mobile apps, and chat bots, allowing them to quickly access on-the-fly information, such as, safety guidelines, operational statistics, and business insights.[3]

FACT AI is being used in an initiative to mitigate wildfire risks. The initiative includes a dynamic wildfire map, optimal resource allocation and first-response proposals. Read more.

5 Improve storage and security capability

Locally storing and processing data on edge devices can reduce the number of security vulnerabilities and can eliminate the need for third-party data storage solutions, which can be susceptible to cyberattacks.
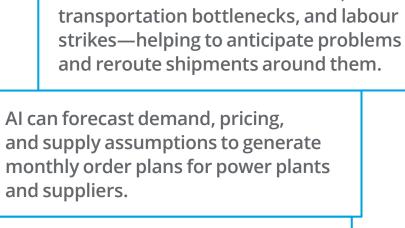
Edge AI technology is typically much more cost-effective than traditional IoT solutions, which require companies to account for the cost of storage in addition to the cost of hardware devices and network bandwidth.[4]
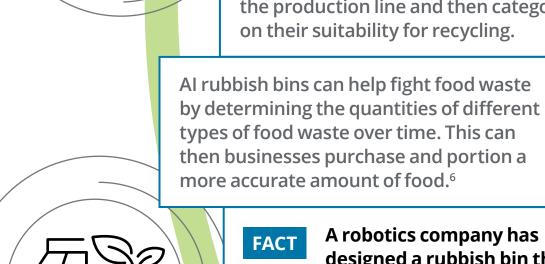
6 Optimise supply and value chains

AI can predict a wide range of unexpected events—such as weather shocks, transportation bottlenecks, and labour strikes—helping to anticipate problems and reroute shipments around them.

AI can forecast demand, pricing, and supply assumptions to generate monthly order plans for power plants and suppliers.

AI can dramatic improvements in key supply chain areas, including demand forecasting, risk planning, supplier management, customer management, logistics, and warehousing, improving operating efficiency and capital management.[5]
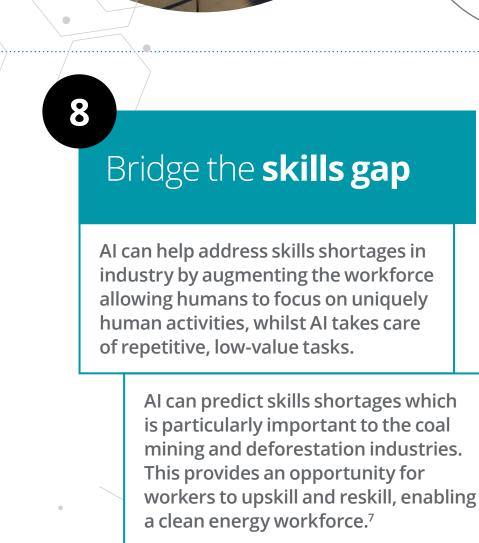
7 Reduce operational waste

AI can detect when items in production lines are damaged. These damaged items can then be automatically removed from the production line and then categorised on their suitability for recycling.
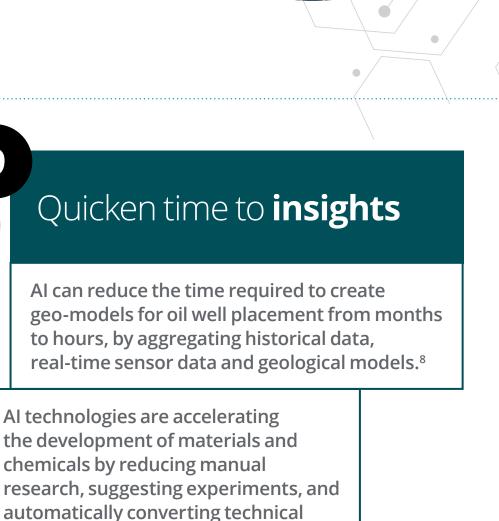
AI rubbish bins can help fight food waste by determining the quantities of different types of food waste over time. This can then businesses purchase and portion a more accurate amount of food.[6]

FACT A robotics company has designed a rubbish bin that uses AI to sort contaminated items from recycling with 95% accuracy. Read more.

8 Bridge the skills gap

AI can help address skills shortages in industry by augmenting the workforce allowing humans to focus on uniquely human activities, whilst AI takes care of repetitive, low-value tasks.

AI can predict skills shortages which is particularly important to the coal mining and deforestation industries. This provides an opportunity for workers to upskill and reskill, enabling a clean energy workforce.[7]

9 Quicken time to insights

AI can reduce the time required to create geo-models for oil well placement from months to hours, by aggregating historical data, real-time sensor data and geological models.[8]

AI technologies are accelerating the development of materials and chemicals by reducing manual research, suggesting experiments, and automatically converting technical documents into searchable databases.

FACT Leveraging historical data on weather events, Deloitte built an AI tool for the QLD Reconstruction Authority to predict what the likely infrastructure impact of a future event would be.

10 Connect a sustainable future

AI can help businesses understand the greatest climate-related risks and opportunities of their physical assets and suppliers, optimising their future investment strategies.

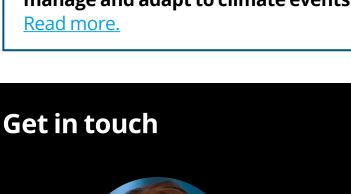AI can provide a complete, data-driven analysis of the commercial implications of energy demands, allowing businesses to understand the reality of their long-term renewable energy procurement strategy.

By clarifying climate risk and opportunities, AI can develop projections that give a deeper understanding respective to different climate scenarios and support businesses to develop a plan to address these.

FACT Deloitte Australia co-developed a digital Drought Resilience Self-Assessment Tool (DR SAT) that leveraged predictive modelling to help farmers better understand, manage and adapt to climate events. Read more.
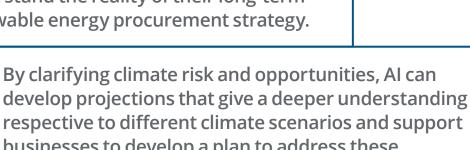
Get in touch

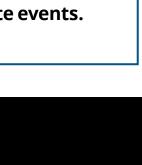**Kellie Nuttall**
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