

# THREE WAYS TO IMPROVE ENERGY SECURITY



Honeywell



**Energy consumption around the world is surging and continued growth is expected. In 2024, it grew at 2.2%, faster than the annual average of 1.3% seen the prior decade (2013–2023). Electricity demand also rose by nearly 1,100 terawatt-hours, or 4.3% in 2024.<sup>i</sup> The demand drivers are numerous: record global temperatures, economic growth in emerging markets, rising power consumption from industry, the electrification of transport and the growth of artificial intelligence (AI) data centers.**

The increase in energy demand poses challenges — namely, rising costs, energy disruptions and even shortages. Companies, organizations and communities need to look at incorporating new energy sources into their overall energy mix to avoid these concerns. This starts with a shift in energy production.

The production and optimization of existing energy systems and processes is critical to supporting a more reliable, affordable and accessible energy supply. Better energy supply means greater energy security.

**Let's review three strategies that energy producers can take today to help strengthen global energy security. More energy security today can help maintain a more stable energy supply for tomorrow.**





# 1 **ENHANCING OPERATIONAL, PRODUCTION AND ENERGY EFFICIENCY**

If harnessed in an optimal manner, artificial intelligence (AI) and digital technologies can help identify new ways to improve energy systems and processes. The starting point: improving energy efficiency. It's not just about switching energy sources; it's about making sure energy doesn't go to waste. Improving energy efficiency on a global scale could have a significant impact as it can help reduce worldwide energy consumption by 31%.<sup>ii</sup> Implementing solutions that measure asset performance, identify process issues and predict corrosion rates — before these issues become costly problems — can help improve energy efficiency. According to the S&P Global Commodity Insights analysis, individual assets can potentially realize 10-25% operating cost reductions and 3-8% in productivity increases with digital solutions and AI-enabled applications.<sup>iii</sup>

Digital solutions can also support greater operational efficiencies. Digital twins, for instance, offer a powerful opportunity to construct digital recreations of energy systems, simulate real-life scenarios and experiment with new designs and processes in a risk-free environment. This technology can help with project exploration, while a distributed control system and process automation solution can help improve process performance and business agility.

While the potential is impactful, a 2025 survey conducted by Honeywell of 300 U.S. decision-makers and influencers in energy and energy-adjacent industries show that 91% of surveyed stakeholders believe that AI has near-term potential to enhance energy security, but only 12% of respondents indicated that AI is currently a critical part of their energy operations.<sup>iv</sup>



## 2 AUGMENTING THE ENERGY MIX

A diverse mix of energy sources can help provide a consistent energy supply when one source becomes unavailable or faces disruptions. Implementing renewable energies and investing in carbon reducing technologies can help energy systems make greater strides towards emissions goals. Energy sources, like liquefied natural gas (LNG) and hydrogen, along with complementary technologies like carbon capture may be options to consider.

LNG is natural gas cooled to a liquid form, making it easier to store and ship, especially to locations without pipelines. It is considered a bridge fuel because it produces 40% less CO<sub>2</sub> than coal and 30% less than oil when burned, while still offering reliability.<sup>v</sup>

Hydrogen produces zero carbon dioxide emissions when burned. There are several types of low-carbon hydrogen, including green hydrogen and blue hydrogen. Green hydrogen is produced with renewables via water electrolysis and is considered a potential major clean energy source of the future. Blue hydrogen is produced from natural gas through reforming processes, with carbon capture technology used to help prevent carbon dioxide emissions from reaching the atmosphere, thus helping to reduce the environmental impacts of the production process.

According to the International Renewable Energy Agency (IRENA), carbon capture technologies that enable blue hydrogen production will be needed to decarbonize end uses where other options are less mature or more costly, such as heavy industry.<sup>vi</sup>

Energy storage solutions can also help augment the energy mix. Distributed Energy Resources (DERs), Battery Energy Storage Systems (BESS), and Energy Management Systems (EMS) can help support a site's resilience to help prevent downtime, especially when grid stability is unpredictable.







# 3 **FACILITATING THE DEPLOYMENT OF NEXT-GENERATION FUELS**

Supporting the growth of Sustainable Aviation Fuel (SAF) and electro-sustainable aviation fuel (eSAF) for cleaner air travel can also help enable energy security. SAF can be blended with petroleum jet fuel and adoption is growing, but not fast enough. By 2035, SAF is expected to represent 11% of worldwide jet fuel demand — which will require delivering approximately 13 billion gallons of SAF annually.<sup>vii</sup> By sourcing biofuels and using waste materials, SAF supports energy security through diversification of fuel sources.

Across the globe, countries are incentivizing the growth of SAF and eSAF. In the United States, incentives like the 45Z Clean Production Fuel Credit promotes the domestic production of low-carbon transportation fuels. In Europe, eFuelEU Aviation promotes the increased use of sustainable aviation fuels (SAF) to decrease aviation CO<sub>2</sub> emissions. This act mandates an increasing percentage of SAF to be consumed in all major European airports from 2025, up to 70% by 2050.<sup>viii</sup> While in Brazil, the Fuel of the Future law raises biofuel mix standards to lower emissions in domestic flights over a 10-year period starting in 2027 as the country has committed to applying a 10% SAF mandate by 2037.<sup>ix</sup>

SAF can help to reduce the aviation industry's reliance on fossil fuels. Significant investment is needed, though. This includes feedstock collection, refining, blending and distribution to meet both current and future SAF demand.



# CONCLUSION

**As energy demands increase, can the energy supply keep pace? A sole reliance on traditional fuel types may prove prohibitive. A potential answer – taking a strategic approach to energy production, distribution and storage to not just keep up with demand but to create global energy security.**

Achieving energy security can't be done by taking just one step. That's why improving energy efficiency of plants and processes, augmenting the energy mix and supporting next-generation fuels is critical. It's important to review your current energy strategies to understand the potential required adjustments to help meet future energy security needs. Each of these strategies is important on their own. Together, these approaches can help improve energy security to better meet the needs of tomorrow, today.

**Want to strengthen your energy strategy? Learn more by downloading our latest whitepaper, [“Strategies to Strengthen Global Energy Security.”](#)**





## Sources:

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